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# e-ICOAEF VII

INTERNATIONAL CONFERENCE ON APPLIED ECONOMICS AND FINANCE  
& EXTENDED WITH SOCIAL SCIENCES

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We are glad that International Conference on Applied Economics and Finance&Extended with Social Sciences gathered a large number of successful academicians and professionals in Bandirma-Balikesir/Turkey.

57 papers were submitted and presented during e-ICOAEF VII from 20 different countries and 65 different universities and institutions. This conference provided as a suitable platform for discussions about the researches. This conference proceeding contains 23 papers.

e-ICOAEF VII participants consisted of from 19 different foreign universities, 44 Turkish universities and 4 official and governmental institutions in Turkey. Scientific board rejected 13 papers directly due to the inconvenience of conference topics, theme and structure of e-ICOAEF VII. Scientific committee also requested some corrections to around 30 different paper then these paper accepted and presented during the conference. All submissions for e-ICOAEF VII reviewed by scientific committee member and examined carefully.

We believe that e-ICOAEF VII provided an opportunity for national and international participants to present, discuss and share practical and theoretical issues in the fields of Economics, Finance and related social sciences. Because there were submitted 38 paper from 18 different countries beyond the Turkey. We accepted participants from Afganistan (1), Algeria (4), Austria (1), Bosnia and Herzegovina (3), Bangladesh (1), Czechia (2), Ghana (1), Greece (2), India (4), Malaysia (3), Nigeria (7), Poland (2), Romania (4), Saudi Arabia (1), Thailand (4), Togo (1), Turkey (32), Turkish Republic of Northern Cyprus (9), United States (4), Venezuela (1).

Finally, we would like to thank our esteemed VII. ICOAEF participants who shared their deep knowledge and experience at VII. ICOAEF. We would like to thank Yaşar University, our congress partner, for their valuable contributions. We would like to be together in our following organizations

On behalf of Conference Organisation Committee

Prof. Burak DARICI

Assoc.Prof. H.Murat ERTUGRUL



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**FIRM-LEVEL REALLOCATION AND ECONOMIC POLICY UNCERTAINTY: EVIDENCE  
FROM THE UNITED STATES**

**Priyasmita Ghosh<sup>1</sup>**

<sup>1</sup>Institute: University of Illinois at Urbana Champaign (UIUC), Email: pghosh6@illinois.edu;

priyasmitaghosh1@gmail.com

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**ABSTRACT**

*The sluggish pace of the recovery of the U.S. from the Great Recession has frequently been blamed on heightened uncertainty, much of which concerns the economic and political landscape. Despite the significance of uncertainty for the aggregate economy, there is no clear consensus about its effects on employment of workers at firms, the sector often the hardest hit. In this paper, I investigate the role of policy-related economic uncertainty on the net employment growth rate, and its components that include the job creation, and destruction rate. In order to do so, I follow a reduced-form approach in which I use the economic policy uncertainty (EPU) index from Baker et al. (2016) and firm level data for U.S. I find a robust, negative correlation between EPU and employment growth rate, using a panel of publicly listed firms. The findings can be rationalized by a “risk premium” theory, that says that higher uncertainty raises the value of liquidity, by making it harder for firms to obtain external financing, manifested by lower hiring and more firing. The key empirical assumption in my analysis, is that firms deriving more revenue from the federal government are, ceteris paribus, more exposed to EPU. I document that a firm at the mean level of exposure to uncertainty, experiences a drop in its net employment growth rate by about 0.22 percent. Using a back-of-the-envelope calculation, I find that EPU can rationalize about 18 percent of the total drop in the aggregate employment growth rate between 2006-2012. These findings can be particularly insightful today, given the COVID-19 pandemic has created an enormous uncertainty shock – larger than the one associated with the global crisis of 2008-09.*

\*I am greatly indebted to Dr. Chen Yeh, for his constructive feedback and continuous support.

## **1. INTRODUCTION**

The recession that followed the 2007-2008 global financial crisis resulted in one of the deepest downturns in post-war U.S. labor markets. U.S. labor markets continued to suffer a slow recovery from its biggest drop in output in the post-war period for a considerable period. Although the recession ‘officially’ ended in June 2009, unemployment was still around 7.8% - much higher than pre-crisis levels in 2012. Several factors, such as low demand due to the financial crisis and the dislocation of capital markets, have been blamed for this slow recovery. A prominent explanation of this demand shock story is the increase in economic policy uncertainty (EPU)- rendering the future path of government policy, tax regime and electoral outcomes to be unknown, and altering the environment in which firms operate. Firms might prefer to delay their hiring or investment decisions to the future, if the adjustment costs are high. In this paper, I investigate this relationship between EPU and the employment growth, job creation and destruction rates, in and around the Global Economic Crisis of 2008-09.

Assessing the impact of political and economic uncertainty is crucial for policymakers, particularly now, due to the unfolding of COVID-19 pandemic with extreme speed. The pandemic has led to a huge spike in uncertainty surrounding various aspects of policy (Baker et al. (2020)): how long it will take to develop and deploy safe, effective vaccines; the duration and effectiveness of social distancing, market lockdowns, and other mitigation and containment strategies; the near-term economic impact of the pandemic and policy responses; the speed of recovery as the pandemic recedes; whether “temporary” government interventions and policies will persist; the extent to which pandemic-induced shifts in consumer spending patterns will persist; and the impact on business survival, new business formation, R&D, human capital investment, and other factors that affect productivity over the medium and long term. To devise appropriate policies, it is logical to look at the current and future macroeconomic effects of such uncertainty, on measures of employment, as it is often the firms and workers, who are worst affected by them.

I focus on the period around the Global Economic Crisis of 2008-2009, a period when U.S. experienced an enormous uncertainty shock similar to COVID-induced uncertainty (Baker et al., VOX, April 2020). In Figure 1, I plot the annual net employment growth rate for all the publicly listed firms for the period 1986-2014 and the economic policy uncertainty index from [policyuncertainty.com](http://policyuncertainty.com). Given the trends observed in the two figures, it affirms that 1) there has been a steady decline in employment growth rate and an increase in economic policy uncertainty around 2008 financial crisis, and 2) The EPU index has an opposite trend as that of employment growth rate.

Several channels can be proposed to describe how uncertainty contributed to employment fluctuations. First, the “real options channel” (McDonald and Siegel (1986)): firms postpone major investments decisions, such as expanding their workforce and buying equipment when faced with uncertainty. These decisions entail large sunk costs that are, at least partially, irreversible that creates an option value of waiting. Second, the “risk premium channel” ((Arellano et al. (2016))): when uncertainty is high, risk premia rise: the cost of external financing increases and the ability of firms to undertake large investments or expand is reduced. Third, “risk aversion or precautionary motive channel” (Fernández-Villaverde et al. (2015)): risk averse investors and managers may turn away from risky, high return projects, potentially resulting in low growth and slow recovery. Though the net effect on job creation is negative for all of the above mechanisms, that on separations is ambiguous and depends on which channel is dominant.

Next, there is a natural concern about what measure of uncertainty should be used for any analysis, as uncertainty is a broad concept that encompasses notions as diverse as risk and ambiguity. Though the measurement of uncertainty has always been an issue of debate, yet the index developed by Baker et al. (2016), has been widely accepted as one of the best available summaries of policy-related economic uncertainty. A more detailed discussion pertaining to this is deferred to Section 4. This index has been used in several empirical studies, for instance, Davis (2019) has found evidence of rising policy related economic uncertainty in the U.S., that has been blamed for sluggish economic recoveries (Leduc and Liu (2013)) and drop in investment rates (Gulen and Ion (2016)).

This paper makes important contributions to the literature of uncertainty and corporate behavior by marrying the two in the same framework. It provides empirical evidence that the political and regulatory institution is a significant source of uncertainty, affecting firms ‘employment growth, hiring and separations rate. In order to derive the quantitative implication, I introduce the change in EPU in reduced form regressions and find evidence of a significant and robust negative correlation between EPU and employment growth rates. This high frequency index helps in capturing the variation in policy uncertainty at a highly granular level.

I consider several additional tests to account for legitimate concerns that EPU might be endogenous to the empirical specifications by conducting a series of robustness tests. For example, if EPU responds to economic conditions, it might be picking up the impacts of omitted variables. To address this issue, first, I control for expected future economic performance by using future forecasted GDP growth and Leading Economic Index. To further mitigate the concern that EPU may simply be picking up the impact of recessions, I exclude NBER recession years from the sample. Second, I control for alternative macroeconomic measures of uncertainty to ensure that the index is not proxying



for other general sources of risk. Third, to sharpen the results, and to dispel the possibility that some other factor drives both EPU and firm hiring/firing decisions, I add the category-specific uncertainty measures in the baseline specification. The baseline analysis shows that policy related economic uncertainty can result in 0.15% drop in reallocation rate for a firm at the mean level of exposure to uncertainty. Using a back-on-the-envelope calculation, I find that EPU can rationalize about 12 percent of the total drop in the aggregate job reallocation rate between 2006-2012. This number might seem low, primarily because the empirical analysis is able to capture only a limited channel of impact i.e. firms/industries have different exposures to uncertainty depending on their exposure to uncertainty. Nevertheless, the role of EPU in impacting job reallocation rate can't be ignored.

The rest of the paper is organized as follows. The next section (Section 2) provides a survey of the relevant literature; Section 3 presents theoretical considerations to motivate the empirical approach; Section 4 provides details of the data used and the variables created; Section 5 presents the methodology followed; Section 6 discusses the baseline empirical results; Section 7 presents robustness checks; Section 8 concludes; Section 9 presents figures and tables and Section 10 concludes.

## **2. RELATED LITERATURE**

This paper contributes to several branches of literature. It connects to the growing literature on uncertainty driven business cycles by considering the role of uncertainty in impacting the various labor flow measures like net employment growth, job creation and destruction. This is done by combining two important strands of literature. First, it deals with the measurement of uncertainty and analyzes how it affects any real economic outcome. Second, it deals with employment decisions of firms and workers in the presence of uncertainty and various types of frictions related to capital, labor and financial adjustments. But, before I delve deeper into these two branches of literature, it is essential to shed some light on the basic facts of employment during the 2008 recessions.

The Great Recession of 2008–09 was by far the most severe United States economic downturn since the Great Depression of the 1930s. Real gross domestic product (GDP), the most comprehensive measure of U.S. economic activity, topped out in fourth quarter 2007 and didn't approach that peak even in 2011. Employment totaled below 138 million jobs in January 2008 and, as of July 2011, was still nearly 5 percent below its pre-crisis level. In effect, employment took longer (51 months) to reach its pre-recession peak than in any other of the previous three recoveries. The various theories proposed to explain this sluggish recovery is: low aggregate demand due to insufficient stimulus by monetary and fiscal policy (Krugman (2010)), and slow growth of public spending (McNichol (2016)). Another argument is continued uncertainty about economic policy (Becker (2011)). This paper studies the role

of time-varying uncertainty in interaction with intensity measures of firms in explaining labor market dynamics, like job creation and destruction rates unlike most of the literature with the exception of Mecikovsky and Meier (2014).

This paper connects to the branch of literature that provides ways to measure policy related uncertainty that include the use of election year dummies (Julio and Yook (2012)). While election years can be associated with increase in policy uncertainty, they fail to capture important variation in non-election years. However, in this paper, I use the index developed, by employing “news chatter” to measure policy uncertainty. The approach allows for far more nuance in approximating time-varying policy uncertainty. I find, firms that are more exposed to government purchases, also witness larger declines in job reallocation rate, consistent with the literature. There are recent papers that provide empirical evidence of impact of EPU on firm and industry level investment (Kang et al. (2014) and Gulen and Ion (2016)).

In order to look at the potential mechanism of the impact, this paper looks at three important channels- 1) real-option value: highlighting the role of labor and capital adjustment frictions (Rodrik (1991), McDonald and Siegel (1986), Dixit and Pindyck (1994)), 2) risk premium: highlighting the high cost of external financing and the inability of firms to expand (Arellano et al. (2016)), and, risk aversion: - risk averse investors and managers may turn away from risky, high return projects, potentially resulting in low growth and slow recovery Fernandez-Villaverde et al. (2015). I discuss the predictions of each of these literatures and explore them to rationalize the empirical findings.

Another branch of literature specifically looks at employment behavior in the presence of uncertainty and adjustment frictions. Cooper et al. (2007), Fujita and Nakajima (2016), Schaal (2017) and others estimate the impact of uncertainty by considering a search model with non-convex costs of posting vacancies, establishment-level profitability shocks and a contracting framework. These kinds of structures analyze both the firm and worker sides and present insights on job creation and destruction under aggregate and idiosyncratic uncertainty. The papers which particularly look at the impact of policy related uncertainty in the labor market are: Pierce and Schott (2016) investigate decline in U.S. manufacturing employment in 2001 due to a change in U.S. tariff policy on Chinese import; Chen and Funke (2005) estimate the impact of policy uncertainty in the form of uncertainty over direct wage costs; and Wang (2013) provides industry evidence of the impact of only fiscal policy uncertainty on labor demand. This paper contributes to this literature by using the index of EPU, and assessing its impact on firm level job creation, destruction and net employment growth rates.

### **3. THEORETICAL CONSIDERATIONS**

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In this section, I will discuss some of the theories that explain the mechanism by which uncertainty can impact real economic activity. This will help rationalize the empirical findings of the paper.

- **Real-option value:** In an environment with rising policy uncertainty and sunk costs, there can be benefits to delaying costly decisions. Using this framework, McDonald and Siegel (1986) provided deep insights into firms' investment behavior under uncertainty. Their contribution generated a large literature that has examined the impact of uncertainty on investment, entry and exit, R&D, technology choices, production, start-up and shut-down decisions, among others. In the core set of theoretical contributions by Dixit (1989) and Dixit and Pindyck (1994)), uncertainty and sunk costs imply an option-value of waiting and are likely to depress entry and exit. In an influential contribution, Bloom, Bond, and Van Reenen (2007) also noted that: “. . . fluctuations in uncertainty can play an economically important role in shaping investment decisions...the existence of labor hiring and firing costs would imply that higher uncertainty would also make employment responses more cautious.

- Hypothesis 1: Firms with a higher exposure to economic policy uncertainty reduce their hiring and firing more in response to such uncertainty.

- **Risk-premium channel:** (Arellano et al. (2016)) Increase in uncertainty can give rise to risk premium. If short-term external financing becomes expensive, higher uncertainty makes liquidity more valuable. Plants may decide to reduce hiring and increase firing in absence of financing. In times of high uncertainty, most plants have a limited capacity to borrow against expected future profits in short term, to finance their wage payments i.e, they face a short-term borrowing constraint. Higher these constraints during uncertainty, more the firms scale down operations by reducing job creation falls and increasing job destruction.

- Hypothesis 2: Firms with a higher exposure to economic policy uncertainty reduce their hiring and increase their firing more in response to such uncertainty.

- **Risk-aversion channel:** If investors are risk-averse, they may turn away from high risky, high return projects, thus resulting in low growth and slow recovery. These precautionary motives may further negatively affect an economy subject to nominal rigidities (Fernández-Villaverde et al. (2015)). If prices are rigid, firms respond to higher uncertainty by setting a higher price as a precaution. If the price is too high, demand goes toward zero and so do profits. Thus, when uncertainty increases, plants raise prices, and consequently, less jobs are created and more jobs are destroyed.

- Hypothesis 3: Firms with a higher exposure to economic policy uncertainty reduce their hiring and increase their firing more in response to such uncertainty.



In context of the above discussions, it should be highlighted that total separations that I observe in the data are composed of layoffs and quits. From the firm's perspective, quits are exogenous and it can be assumed that layoffs and quits do not interact non-linearly with uncertainty, that allows to study layoff decision (Mecikovsky and Meier (2014)). In all of the above theories, the rise in uncertainty unequivocally decreases job creation. However, if firings decrease in uncertainty, the real option effect is the dominating channel and if firings increase, the real option effect is dominated by risk-premium and risk-aversion channels. In the former case, effect on net employment is ambiguous and in the latter case, net employment decreases. At this stage, this paper doesn't distinguish between the risk-premium and risk-aversion channels. I consider a partial equilibrium set-up and choose to focus on a number of extensive margin outcomes in the empirical section such as the job creation, destruction and net employment growth rates.

#### **4. DATA AND VARIABLE CREATION**

##### **4.1. Measuring Economic Policy Uncertainty**

Baker et al. (2016) developed the EPU index for the United States. The index reflects the frequency of articles in the 10 leading U.S. newspapers that contain the following trio of terms: “economic”; “uncertain”; and one or more of “Congress,” “deficit,” “legislation,” “regulation,” or “White House.” A visual inspection of the index (Figure 2) reveals that the index tends to spike during events that are ex-ante likely to cause increases in perceived policy uncertainty, such as debates over the stimulus package, the debt ceiling dispute, major federal elections, wars and financial crashes. Even more detailed inspection of the behavior of EPU around specific events like 9/11 and 2016 Presidential election are provided in Figure 3. Zooming into these events, it can be observed that policy uncertainty rises following the occurrence of these events, rather than predating them.

Baker et al. address potential concerns about newspaper reliability, accuracy, bias, and consistency by evaluating the index in several ways. First, they show a strong relationship between the measure of EPU and other measures of economic uncertainty, for example, implied stock market volatility. Second, they also show a strong relationship between this index and other measures of policy uncertainty. Third, they show that political slant does not distort the overall EPU index. Fourth, they conduct an extensive human audit of major U.S. newspapers and find a high correlation between the human and computer-generated index. Moreover, this index has been widely adopted by organizations like Bloomberg and FRED that suggests it contains useful information for a range of decision makers.

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As discussed earlier, this index captures uncertainty about the specifics of what economic policies will be adopted. It also reflects uncertainty about the economic impacts of policy actions; uncertainty over who will make policy choices; uncertainty about policy responses to non-economic shocks (e.g., a natural disaster). There is a debate about whether policy uncertainty is closer to notions of risk or to Knightian uncertainty, that is, a fundamental lack of knowledge about the future.

Economic volatility refers to wild swings or roller coasters in the financial system and economy. Frank Knight (1921) defined uncertainty as people's inability to forecast the like-lihood of events happening. In contrast, Knight defined risk as peoples known probability distribution over known events. For example, the outcome from flipping a coin is risky. Bloom, Fernandez Villaverde and Schneider in their paper "The macroeconomics of time varying volatility and uncertainty" mention that, uncertainty is forward looking and volatility is realized. For example in the simple Brownian motion process.

$$dX_t = \mu dt + \sigma_{t-1} dw_t \text{ where } dw_t \sim N(0,1)$$

uncertainty about  $dX_{t+1}$  is  $\sigma_t$  and volatility over period  $t-s$  to  $t$  is  $\text{var}(dX_{t-s}, dX_{t-s+1} \dots dX_t)$ . These are linked because  $E[\text{variance of } dX_{t+1}] = \sigma_t$

In their measure, Baker, Bloom and Davis refer to a single concept of uncertainty, although this is typically a substitute for both risk and uncertainty. That is, this index does not take a hard-line view on the separation of risk and uncertainty. The newspaper-based index is a reasonable measure of the universe of ideas that agents in the economy are exposed to. It is logical that agents, at least partly, base their beliefs on the predictions of newspapers. The Economic Policy Uncertainty is a proxy of uncertainty about the "economy" or "economic uncertainty" and "policy" or "political uncertainty". The index thus captures the uncertainty surrounding collapse of LTCM or Black Monday. To match the frequency of the monthly economic policy uncertainty index to the yearly data in the empirical specifications, I take the average of the index in each year.

#### **4.2. Measuring Economic Policy Uncertainty**

To construct the dependent variables, that are the firm level growth rates, I use the U.S. panel data (1986-2014) on publicly listed firms from COMPUSTAT compiled by WRDS. However, the database is private, so I construct the firm level and industry level variables using the COMPUSTAT data-set posted in the official website of Nick Bloom. section describes the construction of the main variables, that I use in the empirical analysis.

Defining the job creation, destruction and net employment growth rates (Davis and Haltiwanger (1992))

Let  $E_{it}$  be employment in year  $t$  for firm  $i$ . The employment growth rate for firm  $i$ , ( $g_{it}$ ) is calculated as follows:

$$g_{it} = (E_{it} - E_{it-1}) / X_{it}$$

$$\text{where } X_{it} = 0.5(E_{it} + E_{it-1}) \text{ and } X_t = \sum_i X_{it}$$

For firm  $i$  at time  $t$ , the job creation rate or the positive employment growth ( $jc_{it}$ ) and the destruction rate or the negative employment growth ( $jd_{it}$ ) are respectively defined as :

$$jc_{it} = \max(g_{it}, 0)$$

$$jd_{it} = \max(-g_{it}, 0)$$

Aggregation: Once job flow measures are defined for each firm, the aggregate rates for the country can be derived using a simple mathematical formula. The aggregate employment growth rates ( $G_t$ ) is calculated by summing up the growth rate of each firm weighted by their size proportional to the aggregate. The gross job creation rate ( $JC_t$ ) is calculated by summing employment gains at expanding and new firms, weighted by their size proportional to the aggregate. Similarly, gross job destruction rate ( $JD_t$ ) is calculated by summing employment losses at shrinking and dying firms, weighted by the proportional size. The difference between job creation and job destruction rate, is known as the net reallocation/employment growth rate ( $G_t$ ). Mathematically,

$$JC_t = \sum_i \frac{X_{it}}{X_t} jc_{it} \quad \dots \dots \dots \text{Equation 1}$$

$$JD_t = \sum_i \frac{X_{it}}{X_t} jd_{it} \quad \dots \dots \dots \text{Equation 2}$$

$$G_t = \sum_i \frac{X_{it}}{X_t} g_{it} \quad \dots \dots \dots \text{Equation 3}$$

The summary statistics at industry and firm level are given in Table 1.

Intensity of exposure to economic policy uncertainty: The EPU only shows variation across time-dimension, but the firms are generally expected to have heterogeneous response to policy related uncertainty. Hence the empirical specification rests on an identification strategy that differentiates firms by exposure to uncertainty about government purchases of goods and services (Baker et al. (2016)).

The identification is based on the premise that there is cross-sectional heterogeneity in the sensitivity of firms to economic policy uncertainty. More specifically, I utilize firm-level data and focus on the fraction of revenue derived from the government sector, particularly the federal

government, which varies across units. It seems natural to focus on the federal government, that has been the primary source of policy uncertainty in the sample considered. The federal budget deficit and debt have risen since the Great Recession. Federal spending is on one side of the fiscal ledger, while taxes are on the other. It is clear that the federal government will either have to cut spending or raise taxes, or both, in order to achieve long- run sustainability. Since the cross-unit difference in the significance of government is more clearly defined in terms of product demand, for which there is also better and more readily available data, I focus on the uncertainty concerning government spending, as opposed to taxes. The basic logic of the identification strategy, is that, if some firms or industries rely more on government purchases, then, all else being equal, the uncertainty concerning economic policies should cause those firms or industries to be more cautious than others about adjusting their factor inputs that are subject to adjustment costs.

This measure of intensity (*intensity<sub>j</sub>*), is constructed for each firm, using the micro data in the Federal Registry of Contracts from 2000 to 2013. The percentage of the parent firm's revenue obtained from federal contracts, is then allocated to three-digit SIC industries using industry codes. The data is aggregated, to construct the average ratio of federal purchases to revenues in each three-digit industry. The measure of each firm's exposure to government purchases is derived as its revenue-weighted mean of the industry-level exposure. If the firm operates in a single three-digit SIC, then its exposure measure equals the corresponding industry exposure measure.

## **5. METHODOLOGY**

The main reduced form specification for all the empirical analyses takes the form given in equation following Baker, Bloom, and Davis (2016). Firms take employment growth decisions in the current period, based on the change in policy uncertainty compared to the last period. Since the economic policy uncertainty only shows time variation, it is interacted with the intensity of exposure to government, that is measured by the percentage revenue derived from federal sales (refer to Section 4). As discussed before, this specification assumes that firms that are more exposed, experience a higher impact of uncertainty and is useful for identifying cross sectional variation. The regression equation also includes the ratio of federal purchases to GDP, as a control for the first moment of uncertainty, interacted with intensity of exposure. Further, the variable sales growth, used as a control in the specification, accounts for firm specific conditions as well as the first moment effects. Thus, this simple baseline specification addresses basic endogeneity concerns.

$$JF_{jt} = \alpha + \alpha_j + \alpha_t + \beta \Delta \log(EPU_t) * intensity_j + \Gamma \Delta X_{jt} + e_{jt} \quad \dots \dots \dots \text{Equation 4}$$



where,  $j$  indexes firms and  $t$  indexes time.  $\alpha_j$  and  $\alpha_t$  are the individual and time fixed effects respectively. The dependent variable  $JF$  stands for either the job creation ( $jc_{jt}$ ), destruction ( $jd_{jt}$ ) or the net reallocation rate ( $g_{jt}$ ) constructed as in equation 1, 2 and 3. The change in logarithm of the economic policy uncertainty interacted with the firm level intensity ( $\Delta \log(EPU_t) * intensity_j$ ), is the primary independent variable for firm/industry level regressions. Hence  $\beta$  is the coefficient of interest.  $X$  includes controls for the economic conditions such as the change in government purchases as fraction of GDP, interacted with firm measure of intensity. Recognizing the fact, that this is a simple linear specification that does not allow for rich response dynamics or interactions between uncertainty and other controls, a few other alternative specifications are tested in Appendix, Table 10 and 11. The table shows polynomial specifications, interaction terms and results without fixed effects. I choose to stick to the baseline specification in equation (4) for all the analyses. The first moment effects need to be controlled for as they pick up the decline in expected future economic conditions especially during recessions, wars, and financial crises, biasing the coefficient of EPU upward. I interact them with the intensity at firm level. The results pertaining to this baseline specification are presented in Table 2.

Identifying assumptions and endogeneity concerns: This approach exploits firm level differences in exposure to certain aspects of policy, mainly government purchases of goods and services. The primary identification assumption is that, including time and firm fixed effects and other controls, firms with greater exposure to government purchases, experience reduced job flow rates rates, when policy uncertainty rises. The main assumption when estimating equation (4) is  $Cov(EPU, \epsilon) = 0$ . When this assumption is violated, causal inference becomes challenging. This can happen as policy responds to economic conditions and might be picking up the impacts of omitted variables, making it endogenous.

The rise in uncertainty is typically a combination of mean or first moment effect and variance or second moment and the latter is commonly known as uncertainty. The first moment effects pick up the decline in expected future economic conditions, especially during recessions, wars, and financial crises, biasing the coefficient of EPU upward, if not controlled for. Additionally, the EPU index may in fact capture (at least partially) the effect of other sources of risk- like uncertainty of the equity markets or the simply the recession effects. There can be other factors like uncertainty related to trade or tax policies that drives both policy uncertainty and firm hiring/firing decisions, and thus there is a need to control for the category-specific measures in the reduced forms. Hence, I need to include appropriate controls in the specification to account for such omitted variables.

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This leads to the robustness tests on the baseline specification, that are discussed in detail in Section 7.

## **6. EMPIRICAL RESULTS**

To investigate whether employment rates are impacted by economic policy uncertainty, I estimate equation (4). The use of the firm level data is expected to provide better causal identification, but the analysis captures the impact only through one channel—government purchases of goods and services.

### **6.1. Employment rates and Economic Policy Uncertainty: Firm Evidence**

Table 2 presents the results at the firm level. The first, second and third column, respectively represents job creation, job destruction and net reallocation or the employment growth rate as the dependent variable and the coefficient of interest  $\beta$ , is reported in the first row. I use the preferred measure of the firm's policy uncertainty exposure and a full set of time and individual effects. The standard errors are clustered at the firm level, to correct for potential cross-sectional correlation in the error term. The relevant coefficient estimates are economically significant and negative for all the job flow measures, at the firm level, as observed from row 1 of Table 2. The table reports a coefficient of -0.08, 0.13 and -0.213 for job creation, destruction and employment growth rates, respectively. However, the coefficient for job creation is statistically not significant. For any firm  $j$ , an EPU change of  $\Delta \log(\text{EPU})$  would imply a drop in job flow rates given by the following formula:

$$\text{Drop in job creation rate} = \Delta \log(\text{EPU}) * -0.079 * \text{intensity}_j * 100$$

$$\text{Drop in job destruction rate} = \Delta \log(\text{EPU}) * 0.134 * \text{intensity}_j * 100$$

$$\text{Drop in job reallocation rate} = \Delta \log(\text{EPU}) * 0.213 * \text{intensity}_j * 100$$

Thus, for a firm that is at the mean intensity of exposure to policy uncertainty, the predicted drop in job creation rate would be 0.08 percentage points, rise in job destruction rate would be 0.14 percentage points and the drop in net reallocation would be 0.22 percentage points between the period 2006-2012, when the EPU index rose by 85.6 log points. This calculation rests on the EPU change between 2006-2012, as this was one the largest swings in the index and the period also includes the “Great Recession” in the United States, when the net employment growth rate suffered a major decline. The other significant large EPU moves during the sample period include, an 82-point fall from 1992 to 1999, a 72- point rise from 1999 to 2001, and a 79-point fall from 2001 to 2006.

Aggregation: Once I find the drop in the job-flow rates for a firm, I can assess the quantitative implication for the economy as a whole. I calculate the aggregate drop net employment growth rate

that can be predicted by economic policy uncertainty, as a percentage of the realized drop in same rate for the year 2006-2012. In order to do so, I first calculate the predicted drop for each firm using equation (5). I proceed with the steps of aggregation by summing up the drop for each firm, weighted by their share of employment as described in Section 4, equation (1), (2) and (3). The resulting number tells us that the change in EPU can predict about 18% of the actual drop-in net employment growth rate, between 2006-2012. Though this is not large, primarily due to the limited channel of exposure, yet this tells us that there is a significant impact.

## **7. ROBUSTNESS**

The correlations in Table 2, might not be causally interpretable due to the potential endogeneity of the economic policy uncertainty variable. The first concern is that of an omitted variable bias. If increase in policy uncertainty tend to happen at the same time as decline in expected future economic conditions (e.g. during recessions, wars, and financial crises), their influence on employment growth rates may be picked up by the policy uncertainty variable, biasing its coefficient upward. The decline in expected future conditions may not be captured by the time fixed effects, if these were more pronounced for the exposed firms. Thus, we need to control for future expected conditions interacted with the firm intensity measure.

I include in the main specification equation (4), one-year-ahead GDP forecasts from the Philadelphia Federal Reserve's biannual Livingstone survey as a proxy for expected GDP growth. Specifically, this variable is measured as the percentage change of the mean GDP forecast from the current GDP level, in order to capture expectations about future economic conditions. I have also included in the main specification, the Conference Board's Leading Economic Index, that is based on 10 indicators that have been shown to have predictive power over future GDP. The proxy is a year on year change in this index. It is used to predict the direction of global economic movements in future months. Businesses and investors often use the index to help plan their activities around the expected performance of the economy and protect themselves from economic downturns. The results presented in Table 3 and Table 4 respectively, show that the general finding, that policy uncertainty is negatively related to net employment growth rate remains valid in all specifications.

To further mitigate the concern that economic policy uncertainty may simply be picking up the confounding effects of recession, I exclude NBER recession years from the sample. In Table 5, I estimate equation (4) on this restricted sample and find that results are very similar to the ones obtained from the unrestricted sample (Table 2).

A second potential concern with the results, is also related to an omitted variables bias, in particular, that the index might partially capture the effect of other sources of uncertainty- e.g.

uncertainty as perceived by the equity markets. I include the change in the logarithm of VIX (implied volatility) index from the Chicago Board Options Exchange in the specification (4), interacted with the firm level intensity measure as a control. The VIX Index is a calculation designed to produce a measure of constant, 30-day expected volatility of the U.S. stock market. On a global basis, it is one of the most recognized measures of volatility - widely reported by financial media and closely followed by a variety of market participants as a daily market indicator. The results in Table 6, with the inclusion of implied volatility lend empirical support to a negative relationship between economic policy uncertainty and employment growth rate.

To sharpen the results and to dispel the possibility that some other factor drives both policy uncertainty and firm hiring/firing decisions, I add the category specific measures like log changes in the trade policy uncertainty (TPU) index and the fiscal policy uncertainty index (FPU) from (Baker et al. (2016)) in the baseline specification. To create indices for subcategories like trade and fiscal policies, additional criteria was applied to news articles that contain the trio of terms about the economy, policy, and uncertainty. The additional criteria involve the presence of one or more category-relevant terms: import tariffs, import duty, import barrier, government subsidies, world trade organization, trade policy etc., for trade policy. Similarly, terms like government spending, federal budget, budget battle, balanced budget, federal debt etc., for fiscal policy. These are derived using results from the Access World News database of over 2,000 US newspapers.

To account for differential response to these uncertainties, I continue to use the fraction of revenue derived from the government sector, particularly the federal government, as a measure of exposure to fiscal policy uncertainty. The trade policy uncertainty is interacted with the trade shares of each sector, based on the assumption that the firms that are more involved in import and export, also respond more to such trade policy uncertainty. The trade share data is obtained from the World Bank data repository and is the averaged across the years of availability, i.e., 1985-2004. The results shown in Table 7, show that the frequency of newspaper articles about these types of policy uncertainty has no additional explanatory power for the employment growth rates. But, the general observation that EPU is negatively correlated to the net employment growth rate, still holds. In Table 8, I present the results for the categorical measures of uncertainty, by considering them separately in different regressions, without controlling for EPU. This helps in assessing whether TPU and FPU has explanatory power for employment at firm level, individually. The results show that only higher FPU can significantly increase job destruction rate for the more exposed firms.

The primary assumption when estimating equation (4) is  $\text{Cov}(\text{EPU}, \varepsilon) = 0$ . If this assumption is violated, causal inference becomes challenging. This might happen, as discussed before, when policy



responds to economic conditions and as a result might be picking up the impacts of omitted variables, making it endogenous. To gain confidence in the robustness of the effect, I use instrumental variable for EPU, as an additional check. I employ an alternative method of extracting exogenous variation from the policy uncertainty measure.

As instruments, I need variables that have a strong impact on policy uncertainty, but do not affect employment growth rates through any other channel, than their relationship with EPU. Based on work in the political science literature, the measure of political polarization seems fitting. This variable intuitively captures the dynamics of policy uncertainty, that is greatest when the two parties have strongly divergent policy preferences and is used by Gulen and Ion (2016), as an instrument for policy uncertainty. In recent years, rather than converging on preferences of the median voter, the economic policy positions of the parties' have diverged sharply. Partisan polarization has been argued to "make it harder to build legislative coalitions, leading to policy gridlock" and potentially "produce greater variation in policy" (Barber and McCarty (2015)). Researchers have noted that the 112<sup>th</sup> Congress, for instance, passed fewer laws than any Congress stretching back to the 1800s.

Holding everything else constant, it would be expected that higher levels of polarization in the House or Senate would result in higher uncertainty related to policy decisions and therefore our polarization measure satisfies the relevance condition for an instrument. Moreover, it is difficult to argue that the level of disagreement between politicians on the liberal-conservative dimension is itself driven by some omitted measures of firm profitability. Political polarization can shape economic outcomes in two ways. First, it can heighten uncertainty about future economic conditions because businesses expect a potential turnover and sharp swings in policy. Facing this possibility, businesses will shy away from major decisions like investment and hiring, preferring instead, intensive lobbying and semi-legal business deals. Second, political polarization can lead to war of attrition, in which each side fails to agree on coherent measures to address the policies. Stymied by issues like gun control and health care, the U.S. House and Senate have often been ineffective in brokering compromise, hampering the political process. These kinds of policy gridlock are unlikely to have an impact on firm level hiring/firing directly, other than through the channel of uncertainty. Though, the index of polarization based on legislator's roll-call voting behavior can lead to certain policies, such as the government shutdown, that can impact employment growth rates, but these will be more prominent for state-owned enterprises.

I use partisan polarization in the United States House of Representatives as an instrument for policy uncertainty. The measure of partisan polarization is based on the DW-NOMINATE (Dynamic weighted NOMINAI Three-step Estimation) scores of McCarty et al. (2003), that have been widely

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used in the political science literature as a method of calculating a legislator's ideological positions over time.

In particular, I focus on the first dimension of the DW-NOMINATE scores, that can be interpreted as the legislator's positions on government intervention in the economy. A score closer to +1 or -1 is described as conservative or liberal and at zero is moderate. The scores are calculated based on a statistical model, using data about who votes with whom and how often to locate legislators on ideological scales. Contemporary political polarization has had important consequences on American public policy (McCarty et al. (2008)). Figure 4 shows the evolution of the differences between the Republican and Democratic party averages in the first dimension of the DW-NOMINATE scores, for both the House and the Senate. Partisan polarization in the United States Senate, as an instrument for policy uncertainty, yields first stage results that are not significant (Appendix, Table 12).

The second stage result of the estimation are presented in Table 9 (the first stage is presented in Appendix, Table 12). The results support the general finding of a negative relationship between employment growth rate and EPU. Furthermore, the F-statistics for the first stage regressions, suggest that a weak instrument problem is not likely. Overall, the tests presented in this section provide strong evidence for our main result, that EPU has a negative impact on employment growth rate.

## **8. CONCLUSION**

In this paper, I investigate the role of policy-related economic uncertainty on the net reallocation/employment growth rate. The recession that followed the 2007-2008 global financial crises was one of the deepest and the U.S. suffered a sluggish pace of recovery from it. The unemployment rate was much higher than the pre-crisis level even four years after the official end of the recession. This has been blamed on the rise in economic and policy uncertainty during the period. I find a significant and robust negative correlation between the two, broadly consistent with theories that highlight the negative impact of policy uncertainty on macroeconomic performance in the United States. I use the risk-premia and precautionary motive channels to rationalize the empirical finding, that says, uncertainty reduces the option of external financing and raises the value of liquidity. Thus, businesses reduce hiring and raise firing, resulting in lower net employment growth. Quantitatively, the EPU can explain about 18% of the total drop in net reallocation rate that is observed, between 2006-2012, a period of a large EPU increase, that includes the great recession.

I conduct a series robustness tests in Section 7, to interpret the results causally. However, there is still room for further analysis, for example, by exploiting close, consequential elections or exogenous sources of variation in policy uncertainty, such as, events like the U.K. Brexit vote

regarding participation in the European Union. While investigating the causal role of policy uncertainty is potentially quite subtle, the results obtained here, if anything, indicate the necessity of sound institutions and policy regimes. Good institutions and policy regimes lessen the scope for policy to act as a source of uncertainty impulse.

There is also scope of justifying the empirical pattern and the mechanism, by modeling labor demand and supply in a framework of search and matching following Cooper et al. (2007). Though the paper captures only a limited channel of exposure, the role of economic policy uncertainty in impacting net reallocation/employment growth rate, can't be ignored. The issue that elevated policy uncertainty in the United States and Europe in recent years may have harmed macroeconomic performance requires thoughtful consideration and hence

have good potential for future research. This analysis will be particularly useful for formulating directed policies towards businesses and workers, when there is an enormous uncertainty shock, such as the COVID-19 pandemic, that is larger than the one associated with the financial crisis of 2008-09.

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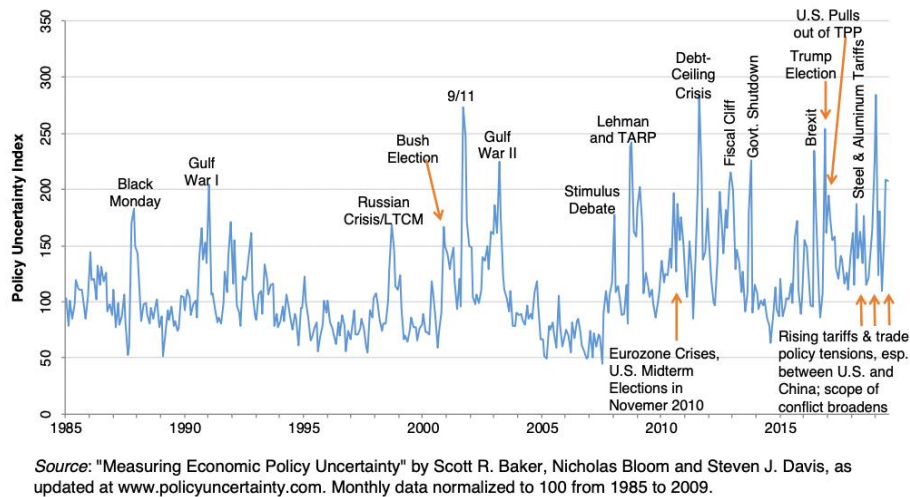
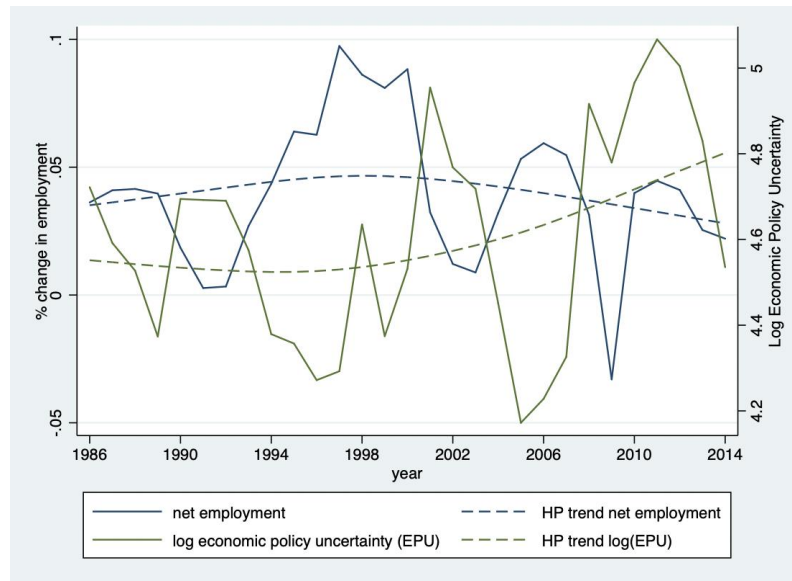
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## 9. FIGURES AND TABLES

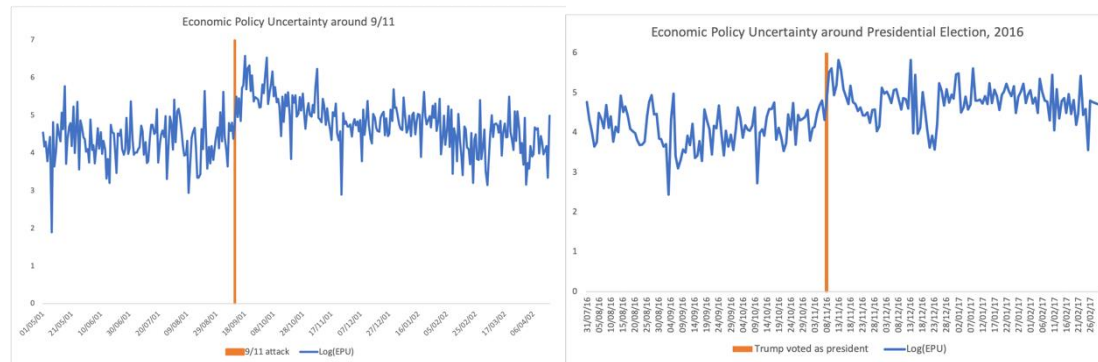
Figure 1: Employment growth rate for all the publicly listed firms in U.S. & the economic policy uncertainty index (Baker, Bloom and Davis (2016)) for 1986-2014

**Figure 2. Economic Policy Uncertainty Shows Spikes at Major Political Events**

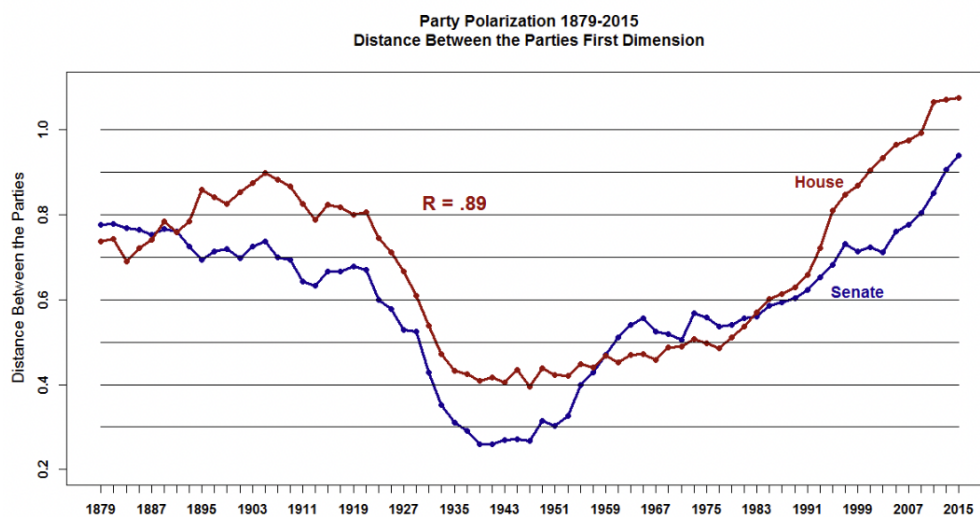


**Figure 3. Behavior of Daily Economic Policy Uncertainty Index Around 9/11 and 2016 Presidential Elections. Economic Policy Uncertainty Peaks Post the Day of These Events**

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**Figure 4. Evolution of partisan polarization in the U.S. based on the DW-NOMINATE scores of Mccarty et al. (2003)**



source: [www.voteview.com](http://www.voteview.com)

**Table 1. Firm Level Summary Statistics (1986-2014)**

Variable Name	No of obs	No of unique firms	Mean	S.D	Median
Job Creation Rate	162,006	17,151	0.12	0.24	0.02
Job Destruction Rate	162,006	17,151	0.09	0.23	0.00
Employment Growth Rate	162,006	17,151	0.03	0.36	0.02
Intensity of EPU	162,006	17,151	0.01	0.05	0.00
Employment	162,006	17,151	6.48	31.17	0.57
Revenue	162,006	17,151	1508.76	8084.51	100.26
Log Economic Policy Uncertainty	162,006	17,151	4.59	0.26	4.59

Notes: This table presents summary statistics of the main variables used in our analysis. The data is yearly and it extends from 1986 to 2014. The table reports the total number of observations, number of unique firms, mean, median and standard deviation for the entire sample period at the firm level.

**Table 2. Firm Level: Employment Rates and Economic Policy Uncertainty**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.079 (0.051)	0.134** (0.045)	-0.213** (0.083)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-1.032 (4.731)	-11.820** (4.464)	10.790 (7.409)
No of observations	162006	162006	162006
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 3. Firm Level: Employment rates and Economic Policy Uncertainty Controlling for Future Expectations**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.087* (0.0563)	0.140** (0.046)	-0.227** (0.085)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	1.886 (5.333)	-13.720** (4.819)	15.600* (8.036)
Forecasted GDP Growth* <i>intensity</i>	-2.820 (2.047)	1.830 (1.686)	-4.650 (2.893)
No of observations	162006	162006	162006
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 4. Firm Level: Employment rates and Economic Policy Uncertainty Controlling for LEI**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.067 (0.053)	0.128** (0.047)	-0.195** (0.080)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-3.821 (4.990)	-10.890** (4.756)	7.070 (7.821)
$\Delta \text{Leading Economic Index} * intensity$	-1.256 (1.152)	1.238 (1.064)	-2.493 (1.771)
No of observations	140755	140755	140755
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.



**Table 5. Firm Level: Employment Rates and Economic Policy Uncertainty Excluding Recession Years**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.118 (0.077)	0.159** (0.063)	0.277** (0.112)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-0.829 (6.396)	-7.633* (5.133)	6.804 (8.928)
No of observations	143307	143307	143307
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 6. Firm Level: Employment Rates and Economic Policy Uncertainty Controlling for Stock Volatility**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.091 (0.063)	0.143** (0.057)	-0.234** (0.099)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-0.829 (4.738)	-12.160** (4.472)	11.330 (7.411)
$\Delta VIX * intensity$	0.030 (0.060)	-0.023 (0.050)	0.053** (0.084)
No of observations	157343	157343	157343
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 7. Firm Level: Employment Rates and Economic Policy Uncertainty, Trade Policy Uncertainty and Fiscal Policy Uncertainty**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.228** (0.105)	0.137 (0.085)	-0.365** (0.147)
$\Delta \log(TPU) * tradeshare$	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)
$\Delta \log(FPU) * intensity$	0.104* (0.063)	-0.002 (0.051)	0.106 (0.089)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-4.974 (5.497)	-11.840** (4.766)	6.870 (8.062)
No of observations	161752	161752	161752
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 8. Firm Level: Employment Rates and Economic Policy Uncertainty, Trade Uncertainty and Fiscal Uncertainty in Separate Regressions**

Dependent Variable	JC Rate	JD Rate	Emp. Gr. Rate	JC Rate	JD Rate	Emp. Gr. Rate
$\Delta \log(TPU) * tradeshare$	0.0001 (0.0001)	-0.0001 (0.0001)	0.0001 (0.0001)			
$\Delta \log(FPU) * intensity$				-0.012 (0.031)	0.0677** (0.027)	-0.0794 (0.0505)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-2.423 (4.648)	-9.535** (4.560)	7.112 (7.388)	-1.683 (5.148)	-13.740** (4.538)	12.05 (7.766)
No of observations	161752	161752	161752	161752	161752	161752
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are clustered at the firm level and are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

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**Table 9. Firm Level: Employment Rates and Political Polarization**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-6.649*** (0.938)	1.478* (0.865)	-8.127*** (1.441)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	10.69 (18.93)	35.93** (17.44)	-25.25 (29.06)
No of observations	80786	80786	80786
Constant	Yes	Yes	Yes
Individual and time fixed effects	Yes	Yes	Yes

Notes: The dependent variable is the change in EPU interacted with the firm intensity and the instrument is log of political polarization interacted with the intensity measure. I focus on the first dimension of the DW-NOMINATE scores, which can be interpreted as the legislators' position on government intervention in the economy (Poole and Rosenthal, 2000). The IV is calculated as the average of these scores for the Republican party members in the House minus the average of the scores for the Democratic party members in the House.

## 10.APPENDIX

**Table 10. Firm Level: Employment Rates & Economic Policy Uncertainty Not Controlling for Fixed Effects**

Dependent Variable	Job Creation Rate	Job Destruction Rate	Emp. Growth Rate
$\Delta \log(EPU) * intensity$	-0.078 (0.048)	0.198*** (0.047)	-0.277*** (0.074)
No of observation	162006	162006	162006
Constant	Yes	Yes	Yes
Firm and time fixed effects	No	No	No

Notes: The sample period runs from 1986 to 2014. The dependent variables are the job creation, destruction and employment growth rates respectively. Standard errors are reported in parentheses. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 11. Firm Level: Introducing Interaction Terms in The Specifications**

Specification	(1) Introducing square of EPU			(2) Interacting EPU & fed-purchase		
Dependent Variable	JC Rate	JD Rate	Emp.gr. Rate	JC Rate	JD Rate	Emp. gr. Rate
$\Delta \log(EPU) * intensity$	-0.083*	0.142**	-0.225**	-0.081	-0.132**	-0.213**
	(0.064)	(0.051)	(0.095)	(0.062)	(0.051)	(0.094)
$\Delta \log(EPU)^2 * intensity$	0.057	- 0.136	0.193	-	-	-
	(0.454)	(0.398)	(0.660)			
$\Delta \log(EPU) * \Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-	-	-	5.779	5.598	0.181
				(48.220)	(47.960)	(76.730)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	-1.183	11.460**	10.280	-1.055	-11.850**	10.790
	(4.812)	(4.620)	(7.532)	(4.727)	(4.431)	(7.354)
No of observation	162006	162006	162006	162006	162006	162006
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm and time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The sample period runs from 1986 to 2014. The dependent variables are the following: JC stands for job creation rate, JD for job destruction rate and Emp. gr. rate for employment growth rate. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively.

**Table 12. Firm Level: First Stage EPU and Political Polarization**

Specification	(1) House	(2) Senate
Dependent Variable	$\Delta \log(EPU) * intensity$	$\Delta \log(EPU) * intensity$
$\Delta \log(Polarization) * (intensity)$	0.270***	-0.011
	(0.012)	(0.015)
$\Delta \frac{\text{Federal Purchase}}{\text{GDP}} * intensity$	13.602***	13.589***
	(0.692)	(0.699)
No of observations	80786	80786
F stats	424.500	193.24

Notes: The dependent variable is the change in EPU interacted with the firm intensity and the instrument is log of political polarization interacted with the intensity measure. I focus on the first dimension of the DW-NOMINATE scores, which can be interpreted as the legislators' position on government intervention in the economy (Poole and Rosenthal, 2000). The IV is calculated as the average of these scores for the Republican party members in the House minus the average of the scores for the Democratic party members in the House. \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level, respectively. Standard errors are reported in parentheses.

**IMPACT OF THE CORONA VIRUS STOCK EXCHANGE CRASH IN 2020 ON THE  
BEHAVIOUR OF SOCIAL TRADERS**

**Zdravko Tretinjak<sup>(1)</sup>**

<sup>1</sup> PhD Student, Faculty of Business and Economics, Mendel University, Brno, Czech Republic,  
xtretinj@mendelu.cz, <https://orcid.org/0000-0002-9984-7521>

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**ABSTRACT**

*The circumstance of the present work is the role of social trading in the changing investment behaviour among the German population after the global financial crisis of 2007 and 2008. The approach would be to analyse transparency and quickly provided information in the context of communication options in social trading platforms when social traders implement their trading strategies and invest in selected asset classes. Some measurable values result from the social trader background. Furthermore, there are possibilities of measuring the performance of the traded securities. In addition, there is the measurement of the communicative behaviour of the social trader. In a stock market crash, most social traders should actually have to react to this extraordinary event. Therefore, comparisons are possible and reasonable during this period. Since investment opportunities in social trading platforms are relatively young and since the advent of social trading platforms, there has not been a major stock market crash like the Corona Virus Stock Market Crash in 2020. This work could possibly provide information on how a private investor can find a non-professional social trader who can assert himself against professional fund managers or other investment opportunities in exceptional situations such as a stock market crash. Individuals should be given an insight into past events in the near-term, as well as what return or loss on investments in social trading offers could have been achieved during that time, or whether it will still be possible in the future. This study will make an additional contribution to the studies on the young topic of social trading.*

**Keywords:** Social Trading, Social Investing, Social Influence, Behavioral Finance.

**JEL Codes:** G01, G11, G23

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## **1. INTRODUCTION**

The Germans are deeply ingrained in the conviction that it is morally right to save money and avoid debt. German households save about 10 per cent of their disposable income (Buck, 2018). This is twice as much as the average EU or American. It is more than a simple financial strategy. There is a protestant tradition of saving and restraint. Thrift means renunciation of present satisfaction. The Germans think they need to prepare for every eventuality, that bad things can hit them and that they need to be ready for that. Therefore, savings are not only made for old-age provision, but also for unforeseen events or targeted acquisitions.

Traditionally, the monetary assets of the German population were saved in term deposits, life insurance, Federal savings notes or savings contracts. As a consequence of the global financial crisis of 2007 and 2008, the European Central Bank (ECB) interest rate has been lowered further and further. The European debt crisis in 2010 also made it necessary to stabilize the southern European debt states by keeping ECB interest rate low. The interest on German savings has declined accordingly. Since the European Central Bank keeps interest rates low, the tabloid press howls that German savers are being robbed. The Germans were suddenly sitting in the interest rate trap (Sauren, 2015).

The millenium was greeted not only with the dot-com bubble, which was considered a speculative bubble for new economy companies and where private investors have not forgotten their losses in stocks until today. Digital media that allowed their users to network with each other via the internet had been on the rise since the turn of the millennium. The development of the internet and portable devices such as the smartphone promoted new community forms. Information could be shared more easily. Collaborative work and social interaction became possible. The concept of social media soon became clear.

In contrast to the previous major crises, private investors were now able to obtain information on investment tips through social media, independently of paid bank advisers. Because of the bitter experience with share losses due to the bubble burst in March 2000, which in particular affected the so-called dotcom companies of the New Economy and the beginning low interest rates after the global financial crisis of 2007 and 2008, German private investors were also looking for alternative investment options. New investment opportunities evolved over time, such as cryptocurrencies, crowdfunding (Reinig et al., 2018) and also social trading (Tretinjak, 2019).



## **2. SOCIAL TRADING**

The word creation consists of two already known words, the word "social", representative of the community approach or a community, and the word "trading", which stands for the trade or exchange of a good (Posner, 2015).

Social trading platforms combine the trading functionalities of classical online broker services with the communication and interaction features of social networks (Glaser and Risius, 2018) which is an advantage (Reith et al., 2020). Social trading platforms are transparent online markets, where order flow is publicly disclosed. Participants on social trading platforms can be categorized into traders (trade leaders or signal providers) and investors (copiers or signal followers), where the former execute unique trades and manage the funds allocated to them by the latter in return for compensation (Gemayel and Preda, 2018). Social trading networks provide access to hedge funds-like returns, but in contrast offer a high transparency, liquidity and accessibility (Neumann et al., 2013).

(Dorfleitner et al., 2018) have analyzed the returns of traders, i.e. signal providers, on social trading platforms and of investors following these traders by utilizing differently sophisticated investment strategies. (Cohen) concluded that using community knowledge and recommendations when building a portfolio does not prove advantageous over buy and hold strategy and does not drop the need for traditional portfolio analysis and professional counseling. (Oehler et al., 2016) has proven that social trading with geographical focus provide better performance than those without. Furthermore, the best performing social trading portfolios earn significant short-term excess returns. (Ammann and Schaub, 2016) have documented that traders with good past performance are more likely to talk about their implemented strategies. (Tretinjak, 2020) has investigated the book recommendations of social traders in German-speaking countries.

## **3. FINANCIAL CRISIS**

A financial crisis reflects the notion of a financial crisis as either a catalyst for, or the initial cause of, a severe and prolonged business cycle downturn. The Great Depression of the early 1930s and the recent "Great Recession" of 2007 – 2009 are only the most dramatic cases in point. Both were associated with a large decline in output, a dramatic decline in investment, an a large increase in the number of persons unemployed (Danthine and Donaldson, 2015).

The corona virus COVID-19 has led to massive losses on the international capital markets: important share indexes lost about 10 % of their value in one day on Monday, March 9th, 2020. This has been the highest daily loss since September 11th, 2001. Even in the financial market crisis and Lehman's bankruptcy, the losses were not so large (Daube, 2020).

#### **4. MATERIAL**

The primary data for this study are collected exclusively on a social trading platform. At the beginning, interviews from a TradersTalk series are collected. Social traders are asked about their background there. The use of an interview guide ensures the quality of the analysis. The social traders reveal something from their private lives, e.g. the profession exercised. Finally, you disclose information that relates to trading in securities. You can find out why these social traders came to trade, why they chose this social trading platform or what their trading strategy is. Advice to beginners and recommended books also provide further information on social traders.

Based on the TradersTalk, the associated portfolios of the interviewed social traders are considered. Important information for investors that can be found in the social traders' portfolios would be the trading idea, the investment universe, the composition of the portfolio, the performance fee, awards received or the capital already invested in the index certificates. What would also be interesting for the study would be the price performance, the trades carried out and the comments of the social trader during the stock crash. Since these are numerical values, they are well suited for descriptive statistics within a quantitative research.

In terms of performance comparison of individual social traders' portfolios during the global Corona Virus Stock Exchange Crash in 2020, the MSCI World is used as a benchmark since social traders are allowed to invest worldwide within their portfolios. The MSCI World is an equity index that reflects the development of more than 1,600 stocks from 23 industrialized countries. It is considered one of the most important stock indices worldwide and is published by the US financial services provider MSCI. The individual stock corporations therein are weighted according to their respective free float market capitalization.

In order to be able to provide information on the role of social trading in the investment behaviour among the German population after the global financial crisis of 2007 and 2008, the type of composition of the assets is first of all to determine how much savings and investment opportunities were available to individual households in the phases under study, by determining household incomes and household levies, which asset classes were served, and how high the respective return opportunities were. In the present case, secondary data can be used.

The relevant data on the type of composition the assets can be found in the databases of the Deutsche Bundesbank which is the central bank of the Federal Republic of Germany. The Deutsche Bundesbank has already published several reports of German households' saving and investment behaviour in light of the low-interest-rate environment. The pure data of the Deutsche Bundesbank are combined with data from the regional statistical data catalog of the Federal Statistical Office. The

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results cover all areas of official statistics at municipal and county level. In order to make the data comparable in an international context, evaluations of the European Central Bank can be used.

Private investor surveys in Germany in response to the low interest rate environment are mandated by banks at the ZEW- Center for European Economic Research (ZEW) or the GfK – Society for Consumer Research.

## **5. METHODS**

As already explained, the low level of interest rates following the global financial crisis of 2007 and 2008 poses a huge problem for German private investors to offset the inflation that is causing them to melt. Interactions in social media propagate new investment opportunities such as cryptocurrencies, crowdfunding and also social trading platforms. As these investment opportunities are relatively new with the rise of new fintech companies and compete with classic banking and insurance products, it is conceivable that their spread and success will not necessarily be covered by studies commissioned by traditional financial services companies.

For this reason, the research is carried out as part of empirical research using a Mixed Methods Research, which is complemented by data analysis (desk research). A sequential design was chosen for this study. Since a quantitative analysis follows a qualitative analysis, we speak of a generalized design. First qualitative research is carried out by using dictionary-based structured content analysis is carried out. This is followed by transfer design or quantification. Afterwards this sample size would be suitable for a quantitative research approach.

## **6. CONCLUSION**

Individuals should be given an insight into past events in the near-term, as well as what return or loss on investments in social trading offers could have been achieved during that time, or whether it will still be possible in the future. The investment behaviour of private individuals has changed since the global financial crisis of 2007 and 2008. Among others, individuals try to follow recommendations in social trading platforms that want to compete with personal banking or asset management. This work could possibly provide information on how a private investor can find a non-professional social trader who can assert himself against professional fund managers or other investment opportunities in exceptional situations such as a stock market crash.

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**A COMPLETE HISTORY OF DELTA METHOD**

**Anil K. Bera<sup>1</sup>, Malabika Koley<sup>2</sup>**

<sup>1</sup> Department of Economics, University of Illinois at Urbana Champaign, IL, USA, e-mail.  
abera@illinois.edu,

<sup>2</sup> Department of Economics, University of Illinois at Urbana Champaign, IL, USA, e-mail.  
mkoley2@illinois.edu,

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**ABSTRACT**

*Use of delta method in mathematical statistics and econometrics is ubiquitous. Its mention can be found in almost all advanced econometrics textbooks but mostly without any reference. It appears that nobody knows for certain when the first paper on the topic was published or how the idea was first conceived. As the Russian poet and essayist Osip Mandelstam (1891-1938) says, “One cannot launch a new history- the idea is altogether unthinkable; there would not be the continuity and tradition. Tradition cannot be contrived or learned. In its absence one has, at the best, not history but “progress”- the mechanical movement of a clock hand, not the sacred succession of interlinked events”, this paper aims to do a comprehensive review of delta method with the objective to trace back to its roots. It gives an account of how the idea first originated in the early nineteenth century from a problem in psychology and later developed into a much more general method that is widely used today. It has been attempted to answer the question of what should be rightfully cited as the first original work on delta method.*

**Keywords:** Delta Method, History of Statistics, Asymptotic Variance.

**JEL Codes:** C10, C12, C13

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## 1. INTRODUCTION

Delta method has ubiquitous presence in statistics and econometrics. Its presence can be found in all advanced statistics and econometrics textbooks from (Cramér, 1946: 352-358), however, almost always without any reference. It seems to be one of those results that has been taken as granted without any history. Thus, it is quite unfortunate that despite being such a widely used tool in statistics and econometrics, its history is obscure till date to the best of my knowledge.

In simple language, one can describe delta method as a technique to find limiting variance of a *nonlinear function* of one or more random variables whose moments are known up to a certain order. We can trace the genesis of delta method to (Spearman and Holzinger, 1924),<sup>1</sup> a paper published in the *British Journal of Psychology*. They formulated a necessary and sufficient condition for the “theory of two factors” to hold which happened to be a *nonlinear* equation with four parameters. The sample analogue naturally becomes nonlinear function whose (asymptotic) variance was the main interest of Spearman and Holzinger. Their methodology was based on the theory of propagation of errors which is a combination of the uncertainty or error of the random variable with the uncertainty of the function. (Doob, 1935)<sup>2</sup> addressed the problem to its most general form and rigorously obtained the expression of the asymptotic variance. The paper was published in the influential journal, though quite new that time, the *Annals of Mathematical Statistics*. (Dorfman, 1938)<sup>3</sup> arrived essentially to a similar result of \cite{doob1935limiting} though in a different fashion. Quite curiously, in a relatively recent paper \cite{ver2012invented}, provocatively titled “Who invented delta method?” the author bestowed full credit of delta method to (Dorfman, 1938). The obscurity of the journal “*Biometric Bulletin*” where Dorfman's paper appeared kept his work almost completely obscured until (Ver Hoef, 2012) “discovered” it. As we mentioned above, soon after the delta method started appearing in textbooks on a regular basis. Thus, for delta method we do not have a history of completely interlinked events, rather a brief succession of disjointed progress.

The *first* aim of this paper is to do a literature review of the delta method. The *second* is to do an analytical comparison of delta method with some of the related literature. The rest of the paper is organized as follows. Section 2 provides an account of the original form of delta method and a brief

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<sup>1</sup> Charles Spearman (1863-1945) was a British Psychologist known for his contributions in statistics, mostly for his rank correlation coefficient called the Spearman's rank correlation coefficient.

Karl J. Holzinger (1892-1954) was an American educational psychologist known for his work in psychometrics like factor analysis.

<sup>2</sup> Joe Doob (1910-2004) was an American mathematician specialising in analysis and probability theory. He served as a professor at the Department of Mathematics in University of Illinois at Urbana Champaign from 1935 until his retirement in 1978. He is most popularly known for Doob martingale.

<sup>3</sup> Robert Dorfman (1916-2002) was an American professor of political economy who made great contributions to the field of economics and statistics. He is more popularly known for his book *Linear Programming and Economic Analysis* with Paul A. Samuelson and Robert M. Solow in 1958.

review of its applications. It also talks about the journey, i.e., its evolution from being conceived for the first time in order to find the variance of a test statistic in psychology to its development into more general methods that are used in a wide range of disciplines to find the limiting distribution and limiting variance of nonlinear functions of statistics. Section 3 provides an account of how delta method appears in some of the classical textbooks of econometrics. Section 4 provides a connection between delta method and Cramér- Rao lower bound (CRLB). Section 5 concludes the paper with an epilogue.

It would be useful to introduce some notations that have been used throughout the paper.  $A \approx B$  means  $A = B + o_p(1)$ , “ $\sim$ ” implies follows a distribution, “ $\xrightarrow{d}$ ” implies convergence in distribution, “ $\xrightarrow{p}$ ” implies convergence in probability and  $\odot$  implies the Hadamard (elementwise) product of two matrices.

## **2. DELTA METHOD**

To start with, let us first provide a simplified version of the delta method commonly used in practice. Let  $\{X_n\}$  be a sequence of random variables such that

$$\sqrt{n}(X - \mu) \xrightarrow{d} X$$

where the distribution of  $X$  is known. If  $g(X)$  be a function of  $\{X_n\}$  such that  $g'(\mu) \neq 0$ , then the distribution of  $g(X_n)$  is given by

$$\sqrt{n}(g(X_n) - g(\mu)) \xrightarrow{d} g'(\mu)X.$$

Let us consider another function  $h(\cdot)$  of  $\{X_n\}$  that has a flatter curvature than  $g(\cdot)$  such that  $h'(\mu) = 0$  and  $h''(\mu) \neq 0$ , then

$$n(h(X_n) - h(\mu))^2 \xrightarrow{d} h''(\mu)X^2$$

Thus, in general, if  $f(\cdot)$  is a function of the sequence of random variables given by  $f(X_n)$  and  $f^r(\mu)$  be the first non-zero derivative of  $f(X_n)$  at the point  $\mu$ , where  $f^r(\cdot)$  is the  $r^{th}$  order derivative of  $f(\cdot)$ , then the distribution of  $f(X_n)$  is given by

$$n^{\frac{r}{2}}(f(X_n) - f(\mu)) \xrightarrow{d} f^r(\mu)X^r.$$

### **2.1. The Beginning: Work of Charles Spearman (1863-1945)<sup>4</sup>**

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<sup>4</sup> For a summary of Spearman's contribution to psychometry see Williams, R. H., D. W. Zimmerman, B. D. Zumbo, and D. Ross (2003). Charles spearman: British behavioral scientist *Human Nature Review* 3(12), 114–118.

The British psychologist Charles Spearman created the first psychometric theory of intelligence, a “two factor theory” which states that each test of a set measures *one* general factor common with all other tests and a *specific* factor that is unique to that test [(Spearman, 1904a), (Spearman, 1904b)]<sup>5</sup>. He utilized the method of *tetrad* differences in analyzing intelligence test data to support his two-factor theory of intelligence. The word ‘tetrad’ comes from the Greek ‘tessera’, which means ‘a group of four’. Consider four traits  $X_i$ ,  $i = 1, 2, 3, 4$ , and let  $\rho_{ij}$  denote the population product moment correlation between  $X_i$  and  $X_j$ ,  $i, j = 1, 2, 3, 4$ . For this case, a tetrad difference is the determinant of a 2 by 2 matrix [see (Kenny, 1974)]<sup>6</sup>. (Spearman, 1922)<sup>7</sup> showed that a necessary and sufficient condition for the validity of the theory of two- factors is  $\rho_{13}\rho_{24} - \rho_{14}\rho_{23} = 0$ . To test this hypothesis  $H_0: \rho_{13}\rho_{24} - \rho_{14}\rho_{23} = 0$ , one can use the sample correlation coefficients  $r_{ij}$ ,  $i=1, 2$  and  $j=3, 4$  and check whether

$$F(r_{13}, r_{24}, r_{14}, r_{23}) = r_{13}r_{24} - r_{14}r_{23} \quad (1)$$

is close to zero. To carry out the test one needs an analytical expression of the variance of  $F(r_{13}, r_{24}, r_{14}, r_{23})$ . Since this is nonlinear in its arguments, a linear approximation is needed. (Spearman and Holzinger, 1924) devised an ingenious method, though it may appear clumsy in today's standard, using *differentials* instead of differential calculus. The differential (d) of F is obtained by replacing each “ $r_{ij}$ ” in equation (1) by the corresponding “ $r_{ij} + d_{ij}$ ” as below

$$\begin{aligned} F + dF &= (r_{13} + d_{13})(r_{24} + d_{24}) - (r_{14} + d_{14})(r_{23} + d_{23}) \\ &= (r_{13}r_{24} - r_{23}r_{14}) + (r_{13}d_{24} + r_{24}d_{13} - r_{23}d_{14} - r_{14}d_{23}) \\ &\quad + (d_{13}d_{24} - d_{14}d_{23}). \end{aligned} \quad (2)$$

Subtracting F from both sides, we obtain

$$(F + dF) - F = (r_{13}d_{24} + r_{24}d_{13} - r_{14}d_{23} - r_{23}d_{14}) + (d_{13}d_{24} - d_{23}d_{14}) \quad (3)$$

If the sample size n is large enough so that the second degree terms in  $d$ 's are of order  $\frac{1}{n}$  and thus become negligible, then equation (3) can be thought of as the derivative of the function F w.r.t. its arguments  $r_{13}, r_{24}, r_{14}, r_{23}$ . From equation (3) we get

<sup>5</sup> Spearman, C. (1904a). Measurement of association, part ii. correction of ‘systematic deviations’. *American Journal of Psychology* 15(1): 88.

Spearman, C. (1904b). The proof and measurement of association between two things. *American Journal of Psychology* 15(1): 72–101

<sup>6</sup> Kenny, D. A. (1974). A test for a vanishing tetrad: The second canonical correlation equals zero. *Social Science Research* 3(1): 83–87.

<sup>7</sup> Spearman, C. (1922). Correlation between arrays in a table of correlations. *Proceedings of the Royal Society of London. Series A, Containing Papers of a Mathematical and Physical Character* 101(708), 94–100.

$$\begin{aligned}
 dF &= (r_{13}d_{24} + r_{24}d_{13} - r_{14}d_{23} - r_{23}d_{14}) + (d_{13}d_{24} - d_{23}d_{14}) \\
 &= A + B, \text{ say and,} \\
 dF^2 &= A^2 + 2AB + B^2
 \end{aligned} \tag{4}$$

This differential  $dF$  can be treated as the sampling error. Thus, by taking the sum of  $dF^2$  over all possible samples and divide it by the sample size  $n$  we obtain the variance, say  $\sigma_F^2$ . We have

$$\begin{aligned}
 \sum A^2/n &= r_{24}^2\sigma_{13}^2 + r_{13}^2\sigma_{24}^2 + r_{14}^2\sigma_{23}^2 + r_{23}^2\sigma_{14}^2 \\
 &+ 2(r_{24}r_{13}\sigma_{r24}\sigma_{r13}R_{24.13} + r_{14}r_{23}\sigma_{r14}\sigma_{r23}R_{14.23} - r_{13}r_{23}\sigma_{r24}\sigma_{r14}R_{14.24} \\
 &- r_{14}r_{24}\sigma_{r13}\sigma_{r23}R_{13.23} - r_{23}r_{24}\sigma_{r13}\sigma_{r14}R_{13.14} - r_{13}r_{14}\sigma_{r23}\sigma_{r24}R_{23.24})
 \end{aligned} \tag{5}$$

Where  $\sigma_{ij}$  is the population standard deviation of  $r_{ij}$  over all possible samples. The product term  $d_{ij}d_{kl}$  denotes how the function changes when both  $r_{ij}$  and  $r_{kl}$  change by the amounts  $d_{ij}$  and  $d_{kl}$ . In terms of propagation of error concept, this indicates how the function varies due to a variation in both the arguments  $r_{ij}$  and  $r_{kl}$  or in other words, the covariance between them. Thus, if  $R_{ij.kl}$  is the product moment correlation coefficient between  $r_{ij}$  and  $r_{kl}$ , the covariance between  $r_{ij}$  and  $r_{kl}$  can be written as  $\sigma_{ij}\sigma_{kl}R_{ij.kl}$ . Spearman assumed the underlying distribution to be normal and hence the values of  $\sigma$  and  $R$  can be computed using available formulae (Pearson and Filon, 1898). The terms in the expression  $\sum AB/n$  contain third order moments and thus become zero due to the normality assumption.

$$\begin{aligned}
 \sum B^2/n &= \sigma_{r13}^2\sigma_{r24}^2(1 + 2R_{13.14}) + \sigma_{r23}^2\sigma_{r14}^2(1 + 2R_{23.14}) - \\
 &2\sigma_{r13}\sigma_{r24}\sigma_{r23}\sigma_{r14}(R_{13.14}R_{23.24} + R_{24.23}R_{13.14} + R_{13.23}R_{24.14}).
 \end{aligned} \tag{6}$$

If the sample size is large enough or  $r$ 's are small enough, the fourth order terms in equation (6) can be ignored. Also, if  $r$ 's are small the value of  $R$  becomes negligible. In that case, ignoring all the fourth order terms of equation (6) involving  $R$ 's we get

$$\sum B^2/n \approx \sigma_{r13}^2\sigma_{r24}^2 + \sigma_{r23}^2\sigma_{r14}^2. \tag{7}$$

Combining the expressions in equations (5) and (7), we obtain the variance of  $F(r_{13}, r_{24}, r_{14}, r_{23})$ , say  $\sigma_F^2$  as

$$\begin{aligned}\sigma_F^2 = & r_{24}^2 \sigma_{13}^2 + r_{13}^2 \sigma_{24}^2 + r_{14}^2 \sigma_{23}^2 + r_{23}^2 \sigma_{14}^2 \\ & + 2(r_{24}r_{13}\sigma_{r24}\sigma_{r13}R_{24.13} + r_{14}r_{23}\sigma_{r14}\sigma_{r23}R_{14.23} - r_{13}r_{23}\sigma_{r14}\sigma_{r24}R_{14.24} \\ & - r_{14}r_{24}\sigma_{r13}\sigma_{r23}R_{13.23} - r_{23}r_{24}\sigma_{r13}\sigma_{r14}R_{13.14} - r_{13}r_{14}\sigma_{r23}\sigma_{r24}R_{23.24}) + \sigma_{r13}^2 \sigma_{r24}^2 \\ & + \sigma_{r23}^2 \sigma_{r14}^2.\end{aligned}\quad (8)$$

Later we will demonstrate that expression (8) can be obtained in a trivial fashion using modern day delta method. Of course, in 1924 Spearman and Holzinger's work was a giant step.

Almost a decade later (Wright, 1934)<sup>8</sup> was working on the path coefficients and used a similar technique for finding the standard error of the following statistic  $P_{01}$ .

$$P_{01} = \frac{r_{01} - r_{02}r_{12}}{1 - r_{12}^2}.$$

Considering sampling errors as differentials, we have

$$\delta P_{01} = \frac{(1 - r_{12}^2)(\delta r_{01} - r_{02}\delta r_{12} - r_{12}\delta r_{02}) - 2(r_{01} - r_{02}r_{12})r_{12}\delta r_{12}}{(1 - r_{12}^2)^2} \quad (9)$$

In the example of Wright, the value of  $r_{12}$  from the sample was negligible; however,  $\delta_{12}$  was nonzero. Thus from (9)

$$\delta P_{01} = \delta r_{01} - r_{02}\delta r_{12}. \quad (10)$$

Thus

$$\sigma_{P_{01}}^2 = \sigma_{r_{01}}^2 + r_{02}^2 \sigma_{r_{12}}^2 - 2r_{02}m_{r_{01}r_{12}},$$

where  $m_{r_{01}r_{12}}$ , is the product moment of the deviations of  $r_{02}$  and  $r_{12}$  and is given by (Pearson and Filon, 1898).

$$m_{r_{01}r_{12}} = r_{02}(1 - r_{01}^2)(1 - r_{12}^2) - \frac{r_{01}r_{12}}{2}(1 - r_{01}^2 - r_{02}^2 - r_{12}^2 + 2r_{01}r_{02}r_{12}).$$

Finally, again treating  $r_{12}$  as negligible, we obtain

$$m_{r_{01}r_{12}} = r_{02}(1 - r_{01}^2) \quad (11)$$

And therefore,

$$\begin{aligned}\sigma_{P_{01}}^2 &= \frac{1}{N}[(1 - r_{01}^2)^2 + r_{02}^2 - 2r_{02}((1 - r_{01}^2))] \\ &= \sigma_{r_{01}}^2 - \frac{r_{02}^2(1 - 2r_{01}^2)}{N}\end{aligned}\quad (12)$$

<sup>8</sup> Sewall Green Wright (1889-1988) was an American geneticist who is popularly known for his work on evolutionary theory and path analysis.

Thus, we see that Spearman and Sewall independently used a similar technique for finding standard error of different test statistics.

## **2.2 Doob's Limiting Distribution Method**

(Doob, 1935) aimed to summarize some of the basic concepts and results in probability and statistics that are used in a variety of applications. He started by building the literature on some basic convergence results of random variables and then established the limiting distribution of a certain class of statistics as an application of the Laplace - Liapounoff Central limit theorem (CLT). One such statistic belonging to this class is the tetrad difference. (Doob, 1935: 167) refers to Spearman's method as a “well known  $\delta$  method” and his own as an “interpretation of it”. However, unlike Spearman Doob's main objective was more general. He aimed to formulate a method to find the limiting distribution of a non - linear function of a random variable instead of concentrating on its limiting variance only. He took inspiration from Spearman's method and established a general result using Taylor series expansion and CLT.

### **2.2.1. Theorem: (Doob, 1935: 166)**

Let  $X_1, X_2, X_3, X_4$ , have a 4 variate distribution with a distribution function (D.F. hereafter) given by  $F(X_1, X_2, X_3, X_4)$ . Also let  $E(X_i)$ ,  $E(X_i^2)$ ,  $E(X_i^2 X_j^2)$  exist and  $E(X_i) = 0$  and  $E(X_i^2) = 1$ .

Now if  $(X_{1j}, X_{2j}, X_{3j}, X_{4j})$  be an identically distributed random sample of size  $n$ ,  $j = 1, 2, 3, \dots, n$  with the same D.F. given by  $F(X_1, X_2, X_3, X_4)$ , then the  $4n$  variate joint distribution of the random sample  $X_{ij}$ ,  $i = 1, 2, 3, 4$  and  $j = 1, 2, 3, \dots, n$  is given in the product form as  $\prod_{j=1}^n F(X_{1j}, X_{2j}, X_{3j}, X_{4j})$ . Let

$$\xi_i = \frac{1}{n} \sum_{k=1}^n X_{ik}; \quad s_{ij} = \frac{1}{n} \sum_{k=1}^n X_{ik} X_{jk}; \quad \text{and } \rho_{ij} = E(X_i X_j).$$

Suppose there is a function  $\psi$  of  $\xi_i$  and  $s_{ij}$  which has continuous partial derivatives up to the second order in a neighbourhood M of P:  $\xi_i=0, s_{ij}=\rho_{ij}$  where,  $P=\{(\xi_i, s_{ij}): \psi(\xi_i, s_{ij}), \text{ is continuous and has finite second order partial derivatives}\}$ .

Under these conditions,  $\sqrt{n}[\psi(\xi_i, s_{ij}) - \psi(0, \rho_{ij})] \sim N(0, \sigma^2), \sigma > 0$ , where,  $\sigma^2$  is given by

$$E \left[ \left\{ \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} X_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} (s_{ij} - X_i X_j) \right\}^2 \right] \quad (13)$$

**Proof:** Expanding the function  $\psi$  using Taylor series expansion in the neighborhood of P up to the first order we have



$$\sqrt{n}[\psi - \psi(P)] = \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} \xi_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (s_{ij} - \rho_{ij}) + R_n, \quad (14)$$

where  $R_n$  is a linear combination of  $\sqrt{n}\xi_i\xi_j$ ,  $\sqrt{n}\xi_i(\rho_{jk} - s_{jk})$  and  $\sqrt{n}(\rho_{ij} - s_{ij})(\rho_{kl} - s_{kl})$  with coefficients uniformly bounded in the neighborhood M. Also,  $\xi_i \xrightarrow{p} 0$  and  $s_{ij} \xrightarrow{p} \rho_{ij}$ . Thus, it can be shown by law of large numbers (LLN) that  $R_n \xrightarrow{p} 0$ . Therefore equation (14) can be written in an asymptotically equivalent form as

$$\sqrt{n}[\psi - \psi(P)] \approx \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} \xi_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (s_{ij} - \rho_{ij}) \quad (15)$$

Hence,

$$E(\sqrt{n} [\psi - \psi(P)]) \approx \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} E(\xi_i) - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} E(s_{ij} - \rho_{ij}).$$

Now

$$E(\xi_i) = E(X_{ik}) = 0$$

$$E((s_{ij} - \rho_{ij}) = E(X_{ik}X_{jk} - \rho_{ij}) = 0 \quad (16)$$

and,

$$var(\sqrt{n} [\psi - \psi(P)]) = E \left( \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} \xi_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (s_{ij} - \rho_{ij}) \right)^2 \quad (17)$$

Noting that

$$\begin{aligned} & \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} \xi_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (s_{ij} - \rho_{ij}) \\ &= \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} \left( \frac{1}{n} \sum_{k=1}^n X_{ik} \right) - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} \frac{1}{n} \sum_{k=1}^n (X_{ik}X_{jk} - \rho_{ij}) \\ &= \frac{1}{\sqrt{n}} \sum_{k=1}^n \left[ \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} X_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (X_i X_j - \rho_{ij}) \right] \quad (18) \end{aligned}$$

Hence, the variance is given by

$$\begin{aligned} var(\sqrt{n} [\psi - \psi(P)]) &= E \left( \sum_{i=1}^4 \frac{\partial \psi}{\partial \xi_i} \sqrt{n} X_i - \sum_{i,j=1}^4 \frac{\partial \psi}{\partial s_{ij}} \sqrt{n} (X_i X_j - \rho_{ij}) \right)^2 \\ &= \sigma^2. \quad Q.E.D. \quad (19) \end{aligned}$$

It is interesting to note the connection between (Doob, 1935) and (Spearman and Holzinger, 1924)'s approach. Comparing equations (3) and (14), we see that the function  $\psi(\xi_i, s_{ij})$  is analogous with the tetrad difference which is a function  $F(\cdot)$  of  $r_{ij}$ 's. Spearman's  $F$  was a function of the four product moment correlation coefficients while Doob's function  $\psi(\cdot)$  is a function of  $\xi_i$  and  $s_{ij}$ . The terms on the right side of equation (12) follow normal distribution by Laplace - Lipounoff CLT. Thus, using equations (16) and (19),  $\sqrt{n} [\psi - \psi(P)]$  asymptotically follows normal distribution with mean zero and variance given by  $\sigma^2$ .

### **2.3. Dorfman's Limiting Variance Method**

An electronic search of the paper does not show any result. This is probably due to the obscurity in the name of the journal or the year of its publication (Ver Hoef, 2012). The journal which is currently known as *Biometrics* was earlier known as *Biometric Bulletin*. Its only volume ever published had three issues out of which the first one came out in 1936. However, Dorfman's paper was published in its third issue in 1938. Fortunately, (Ver Hoef, 2012) provided details of (Dorfman, 1938).

Defining

$$Y = f(X, X_2, \dots, X_k) = f(X), \quad (20)$$

by Taylor series expansion around  $x_i = \mu_i$ , we have,

$$Y = f(X) = f(\mu) + d'(X - \mu) + \frac{1}{2}(X - \mu)'H(X - \mu), \quad (21)$$

where,  $X = (X, X_2, \dots, X_k)'$ ;  $\mu = (\mu_1, \mu_2, \dots, \mu_k)'$ ;  $d = (f_1(\mu), f_2(\mu), \dots, f_k(\mu))'$ ;  $f_i(\mu) = \frac{\partial f(\mu)}{\partial x_i} |_{X = \mu}$

and  $H$  is the Hessian matrix

$$H = \begin{pmatrix} f_{1,1}(\xi) & f_{1,2}(\xi) & \cdots & f_{1,k}(\xi) \\ \vdots & \vdots & \ddots & \vdots \\ f_{k,1}(\xi) & f_{k,2}(\xi) & \cdots & f_{k,k}(\xi) \end{pmatrix}$$

with  $f_{ij}(\xi) = \frac{\partial^2 f(x)}{\partial x_i \partial x_j}$ ,  $i, j = 1, 2, \dots, k$ .

Also, let  $E(X_i) = \mu_i$ ;  $var(X) = \Sigma = (\sigma\sigma') \odot R$ ; where  $var(X_i) = \sigma_i^2$ ;  $\sigma = \{\sigma_1, \sigma_2, \dots, \sigma_k\}'$  and  $R$  is a matrix with  $R[i, j] =$  correlation between  $X_i$  and  $X_j$  denoted as  $\rho_{ij}$ . Now, if  $\delta_Y$  and  $\delta = (\delta_1, \delta_2, \dots, \delta_k)$  be zero mean random variables and  $\delta$  has the same variance structure as  $X$ . Then  $var(\delta) = \Sigma = (\sigma\sigma') \odot R$ . Thus adding error terms denoted by  $\delta$  on both sides of equation (19) we obtain

$$\mu_Y + \delta_Y = f(\mu_1 + \delta_1, \mu_2 + \delta_2, \dots, \mu_k + \delta_k). \quad (22)$$

This equation has a striking resemblance with equation (3) in the Spearman's propagation of error approach. However, unlike in equation (3), the functional form of  $f(\cdot)$  is unknown in this case. As in (Doob, 1935) [see equation (13)] this calls for a general technique to linearize  $f(\cdot)$  in equation (22) (however note the use of differentials as in (Spearman and Holzinger, 1924) as

$$\begin{aligned} \mu_Y + \delta_Y &= f(\mu) + f_1(\mu)\delta_1 + f_2(\mu)\delta_2 + \dots + f_k(\mu)\delta_k \\ &+ \frac{1}{2}\{f_{1,1}(\mu + \delta \odot \Theta)\delta_1^2 + \dots + f_{k,k}(\mu + \delta \odot \Theta)\delta_k^2 + 2f_{1,2}(\mu + \delta \odot \Theta)\delta_1\delta_2 + \dots \\ &+ 2f_{k-1,k}(\mu + \delta \odot \Theta)\delta_{k-1}\delta_k\}, \end{aligned}$$

where,  $\Theta = (\Theta_1, \Theta_2, \dots, \Theta_k)$  and  $0 < \Theta_i < 1$ . Assuming the deviations to be small one can ignore the second order terms in  $\delta$  and obtain

$$\mu_Y + \delta_Y \approx f(\mu) + f_1(\mu)\delta_1 + f_2(\mu)\delta_2 + \dots + f_k(\mu)\delta_k.$$

Subtracting  $\mu_Y$  from both sides we get

$$\delta_Y = f_1(\mu)\delta_1 + f_2(\mu)\delta_2 + \dots + f_k(\mu)\delta_k$$

Thus

$$\delta_Y^2 = \delta_1^2 f_1^2(\mu) + \dots + \delta_k^2 f_k^2(\mu) + 2\delta_1\delta_2 f_1(\mu)f_2(\mu) + \dots + 2\delta_{k-1}\delta_k f_{k-1}(\mu)f_k(\mu).$$

Finally, taking expectation on both sides, we get the limiting variance as,

$$\sigma_Y^2 \approx \sigma_1^2 f_1^2(\mu) + \dots + \sigma_k^2 f_k^2(\mu) + 2\sigma_1\sigma_2 f_1(\mu)f_2(\mu) + \dots + 2\sigma_{k-1}\sigma_k f_{k-1}(\mu)f_k(\mu). \quad (23)$$

Hence, we see that although Doob and Dorfman's results are different in spirit, they are similar in the sense that both of them have used Spearman's idea along with first order Taylor series expansion. It is fairly safe to say that (Spearman and Holzinger, 1924) was the first to recognize that standard error of nonlinear functions can be calculated easily once the function is linearized. Their focus, however, was on the tetrad difference only. Hence (Doob, 1935) and (Dorfman, 1938) generalized the idea and developed it for general nonlinear function though concentrating on particular examples. Therefore, we can say that the delta method was not developed in its form that we know, but as solutions to some practical examples in (Spearman and Holzinger, 1924) and (Wright, 1934) and in (Doob, 1935) still for a special function of sample means and covariances.

### **3. MODERN TEXTBOOKS**

As mentioned earlier all the advanced statistics and econometrics textbooks covers the delta method a distribution and the limiting variance of a differentiable function of a statistic as described in the following theorem.

**3.1. Theorem: (Rao, 1973: 387)**

Suppose we have a statistic  $(X_{1n}, X_{2n}, \dots, X_{kn})$ , where  $(\sqrt{n}(X_{1n} - \theta_1), \sqrt{n}(X_{2n} - \theta_2), \dots, \sqrt{n}(X_{kn} - \theta_k))$  is asymptotically distributed as  $N(0, \Sigma)$ ,  $\Sigma = (\sigma_{ij})$ . Then if  $g(\cdot)$  be a totally differentiable

function of  $(X_{1n}, X_{2n}, \dots, X_{kn})$ , the asymptotic distribution of  $g(X_{1n}, X_{2n}, \dots, X_{kn})$  is given as

$$\sqrt{n}u_n = \sqrt{n}[g(X_{1n}, X_{2n}, \dots, X_{kn}) - g(\theta_1, \theta_2, \dots, \theta_k)] \xrightarrow{d} N(0, v(\theta)), \quad (24)$$

where,  $v(\theta) = \sum \sum \sigma_{ij} \frac{\partial g}{\partial \theta_i} \frac{\partial g}{\partial \theta_j}$ .

**Proof:** Expanding  $g(X_{1n}, X_{2n}, \dots, X_{kn})$  by Taylor series expansion, we get

$$g(X_{1n}, X_{2n}, \dots, X_{kn}) \approx g(\theta_1, \theta_2, \dots, \theta_k) + \sum_{i=1}^k (X_{in} - \theta_i) \frac{\partial g}{\partial \theta_i}. \quad (25)$$

Thus equation (25) can be rewritten as,

$$\sqrt{n}[g(X_{1n}, X_{2n}, \dots, X_{kn}) - g(\theta_1, \theta_2, \dots, \theta_k)] \approx \sum_{i=1}^k (X_{in} - \theta_i) \frac{\partial g}{\partial \theta_i} \quad (26)$$

The right side of equation (26) is a linear combination of some random variables that are asymptotically normally distributed. Hence,  $\sqrt{n}[g(X_{1n}, X_{2n}, \dots, X_{kn}) - g(\theta_1, \theta_2, \dots, \theta_k)]$  will be asymptotically distributed as normal with mean zero and variance  $v(\theta)$ .

Now, we describe how (Rao, 1973: 387) presented the “ $\delta$  method” in determining the limiting variance of  $g(X_{1n}, X_{2n}, \dots, X_{kn})$ .

Taking the total differential of  $g(X_{1n}, X_{2n}, \dots, X_{kn})$  w.r.t.  $\theta_1, \theta_2, \dots, \theta_k$ , we get,

$$dg = \frac{\partial g}{\partial \theta_1} dX_{1n} + \dots + \frac{\partial g}{\partial \theta_k} dX_{kn}. \quad (27)$$

where,  $dX_{in} = (X_{in} - \theta_{in})$ ,  $i = 1, 2, \dots, k$ .

Thus, taking variance on both sides gives us,

$$var(dg) = \frac{1}{n} \sum_i \sum_j \frac{\partial g}{\partial \theta_i} \frac{\partial g}{\partial \theta_j} cov(X_{in}, X_{jn}), \quad (28)$$

and hence we have,

$$\sqrt{n}var(g(X_{1n}, X_{2n}, \dots, X_{kn})) = \frac{1}{n} \sum_i \sum_j \frac{\partial g}{\partial \theta_i} \frac{\partial g}{\partial \theta_j} \sigma_{ij}. \quad (29)$$

which is the same as in (24). (Davison, 2003) mentions delta method in his book to find the variance and variance estimates of a smooth function of a random variable.

### 3.2. Theorem: (Davison, 2003)

Suppose  $X_n = \mu + \frac{1}{\sqrt{n}} \tau Z_n$ , where  $Z \sim N(0, 1)$  and  $nvar(X_n) \xrightarrow{p} \tau^2 (> 0)$  so that  $\frac{X_n - \mu}{\sqrt{var(X_n)}} \xrightarrow{d} Z$ . Let  $h(\cdot)$  be a continuously differentiable function of  $X_n$  with non- zero derivative at  $\mu$ , then, the following holds

$$(h(X_n) - h(\mu)) \sim N(0, h'(\mu)^2).$$

**Proof:** Expanding  $h(X_n)$  by Taylor series expansion,

$$\begin{aligned} \sqrt{n} \frac{(h(X_n) - h(\mu))}{\tau h'(\mu)} &= \sqrt{n} \frac{(h(X_n) - h(\mu))}{\tau h'(\mu + n^{-1/2} \tau W_n)} \times \frac{(h'(\mu + n^{-1/2} \tau W_n))}{h'(\mu)} \\ &= Z_n \times \frac{(h'(\mu + n^{-1/2} \tau W_n))}{h'(\mu)} \end{aligned} \quad (31)$$

where,  $Z_n \xrightarrow{d} Z$  and  $\frac{(h'(\mu + n^{-1/2} \tau W_n))}{h'(\mu)} \xrightarrow{p} 1$ . Hence,  $h(X_n) \sim N(0, h'(\mu)^2)$ . Q. E. D.

(Harrell, 2001) uses delta method in the estimation of accelerated failure time models. He defines it as a method that is used to find the limiting variance of a function of a statistic when the variance of the statistic is known. Let the estimated parameters (statistic) be given by  $(\hat{\beta}, \hat{\sigma})$  and its variance is  $\hat{V}$ . Suppose we are interested in finding the asymptotic variance of the function

$f = \frac{[\log(t) - X\hat{\beta}]}{\hat{\sigma}}$ . Then if  $F$  denotes the vector of derivatives of  $f$  w.r.t.  $(\beta_0, \beta_1, \dots, \beta_p, \sigma)$ ; that is,  $F = [-1, -X_1, -X_2, \dots, -X_p, -\log(t) - X\hat{\beta}] / \hat{\sigma}$ . The variance of  $f$  can be approximated by

$$var(f) = F \hat{V} F'.$$

(Agresti, 2003) refers to delta method as the method that is used to derive large sample normal distributions for many statistics. He uses the method to find the asymptotic variance of some functions of odds ratio such as the log odds ratio. Below we shall derive the asymptotic distribution of the log odds ratio.

Let  $X \sim Bin(n, p)$ . We know that the MLE of  $p$  is given by  $\hat{p}$  is given by  $\frac{X}{n}$ . Also  $E\left(\frac{X}{n}\right) = E(\hat{p}) = p$  and  $var\left(\frac{X}{n}\right) = var(\hat{p}) = \frac{p(1-p)}{n}$ . Thus by CLT  $\sqrt{n}(\hat{p} - p) \xrightarrow{d} N(0, p(1-p))$ .

Let us now consider the log odds ratio

$$g(\hat{p}) = \log \frac{\hat{p}}{\hat{p}(1 - \hat{p})}.$$

The derivative of  $g(\hat{p})$  evaluated at  $p$  is given by  $\frac{1}{p(1-p)}$ . Now applying delta method we get  $E(g(\hat{p}) - g(p)) = 0$  and  $var(g(\hat{p})) = [1/p(1-p)]^2 var(\hat{p})$ .

Thus ,

$$\sqrt{n} \left( \log \frac{\hat{p}}{(1 - \hat{p})} - \log \frac{1}{(1 - p)} \right) \sim N \left( 0, \frac{1}{(1 - p)} \right).$$

The delta method is also used as a bias correction technique or more specifically to find the expectation of a non linear function of a statistic. Let us consider an illustrative example from (Ver Hoef, 2012) to explain this.

Let  $f(X)$  be a non linear function of a random variable  $X$ , where  $f(X) = \frac{e^x}{1+e^x} = Z$ , say, and  $X \sim N(2, 0.2^2)$ . Suppose we are interested in finding the expectation of  $Z$ .

A naive researcher may resort to the basic back- transformation method such as

$$Z = \frac{e^x}{1+e^x}, i. e., X = \log \left( \frac{Z}{1-Z} \right). \text{ Therefore, } \mu = E(X) = E \left( \log \left( \frac{Z}{1-Z} \right) \right).$$

Thus we have the expectation of the transformed variable  $\log \left( \frac{Z}{1-Z} \right)$  as we know the value of  $\mu$ . But it is obviously more desirable to report the mean of the true variable instead of the transformed one, i.e.,  $E(Z)$ . So one might do a back transformation to get  $E(Z) = \frac{e^\mu}{1+e^\mu}$  which is 0.881 for this example.

Alternatively, one can find  $E(Z)$  in a more sophisticated way with the help of delta method. Expanding the function  $Z = f(X)$  by Taylor series expansion around  $\mu$  up to the second order,

we get

$$Z = f(X) \approx f(\mu) + f'(\mu)(X - \mu) + \frac{1}{2} f''(\mu)(X - \mu)^2, \quad (32)$$

where,  $f'(x) = \frac{e^x}{(1+e^x)^2}$  and  $f''(x) = \frac{e^x(1-e^x)}{(1+e^x)^3}$ . Taking expectation on both sides of equation (32) we get

$$E(Z) \approx f(\mu) + \frac{1}{2} \frac{e^\mu(1-e^\mu)}{(1+e^\mu)^3} = 0.861.$$

Simulation studies (Ver Hoef, 2012) report the expected value as 0.862 which is much closer to that obtained by delta method than that by back transformation approach. However, accuracy of delta method depends largely on the functional form (Oehlert, 1992).

There are indeed many textbooks which cover the delta method in a more or less similar fashion. Apart from these, there have been some recent applications of delta method to find the asymptotic distribution of functionals which in simple words can be described as "function of functions" and random operators, see for instance, (Aït-Sahalia, 1994), (Beutner and Zähle, 2010) and (Cupidon, Gilliam, Eubank and Ruymgaart, 2007).

#### **4. CONNECTION BETWEEN DELTA METHOD AND CRAMÉR -RAO LOWER BOUND (CRLB)**

Let us write equation (29) as

$$\text{var}(\sqrt{n}g(\hat{\theta})) = g'(\theta)\Sigma_g g(\theta), \quad (33)$$

where,  $\hat{\theta} = (\hat{\theta}_1, \hat{\theta}_2, \dots, \hat{\theta}_n)'$  is a consistent estimator of  $\theta$  and  $\Sigma$  is the asymptotic variance of  $\hat{\theta}$ . The

finite sample version of CRLB [see (Rao, 1973: 387), equation (5a.3.1)] is also valid

asymptotically; thus

$$\text{var}(\sqrt{n}g(\hat{\theta})) \geq \text{var}(\sqrt{n}g(\hat{\theta}_{MLE})) - g'(\theta)I(\theta)^{-1}g(\theta), \quad (34)$$

where,  $I(\theta)$  is the information matrix under the true probability distribution. The lower bound in (34)

is valid independently of any method of estimation. We know that the equality holds when  $\hat{\theta} = \hat{\theta}_{MLE}$ , i. e.,

$$g'(\theta)\Sigma_g g(\theta) = \text{var}(\sqrt{n}g(\hat{\theta})) \geq \text{var}(\sqrt{n}g(\hat{\theta}_{MLE})) - g'(\theta)I(\theta)^{-1}g(\theta). \quad (35)$$

Equation (35) represents a neat connection between delta method and CRLB. In the context of testing a nonlinear hypothesis, say,  $H_0: g(\theta) = c$ , where  $c$  is a known constant, the inference results will depend on what estimation procedure is used to obtain  $\hat{\theta}$ . Use of sub-optimal methods such as, method of moments (MM) or generalised MM (GMM) may lead to frequent false acceptance of  $H_0$ .

#### **5.EPILOGUE**

The method that originated in the early 19<sup>th</sup> century is one of the most basic yet widely used in statistics and econometrics. Let us take a look back in time to get a more vivid picture of its journey.

From the book *Crossroads In The Mind Of Man* (Kelley, 1928), it is apparent that the germ of the idea of delta method originated in 1920's through (Spearman and Holzinger, 1924) and (Kelley, 1928)'s work on the tetrad difference. While Spearman and Holzinger used the symbol  $\delta$ , Kelley used the symbol  $\Delta$  to refer to the same method. Later (Doob, 1935) referred to the method as an already



established statistical technique to find the limiting distribution of a non linear function of a statistic and used the symbol  $\delta$ . (Dorfman, 1938) also used the symbol  $\delta$  to find the limiting variance of a function of a statistic, but in a more formal way. An electronic search of *delta method* reveals (Bishop, Fienberg and Holland, 2007) as the first (to the best of our knowledge) to have used the word *delta* instead of the symbol  $\delta$  or  $\Delta$ . The popularity of the use of “delta” instead of  $\delta$  or  $\Delta$  may be due to the ease of writing or typing (for electronic use) *delta* over  $\delta$ . The term “delta method” is used more liberally to address a broader spectrum of problems related to the non linearity of the function of a statistic, i.e, the purpose of delta method has diversified from being a method to find the standard error of a function of a statistic to a method that can be used to find the limiting variance and variance estimates, as a variance stabilizing transformation method, limiting distribution and as a bias correction technique of functions of random variables although it is not clear how or when this transition took place. Moreover, from the above discussion it is evident that although Spearman and Holzinger first came up with the idea of delta method, it was Doob and Dorfman who re-established it in a more formal way that is used today. Therefore in view of this it can be opined that along with Doob and Dorfman, Spearman and Holzinger also deserve recognition for their idea and hence their work (Spearman and Holzinger, 1924) should be referred to in relevant literature.

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**NONLINEAR MODELLING OF BIST-100 INDEX RETURNS VIA  
TAR AND MARKOV-SWITCHING MODELS**

**Yakup ARI<sup>1</sup>**

<sup>1</sup> Alanya Alaaddin Keykubat University, Orcid: 0000-0002-5666-5365, yakup.ari@alanya.edu.tr

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**ABSTRACT**

*The aim of this study is to use nonlinear models to estimate BIST-100 Index return. For this purpose, Threshold Autoregressive and Markov-Switching models are applied to the daily BIST-100 Index return data. Before starting the analysis, the stationarity of the data set is tested and then the various linearity tests, which are available in the literature, are applied. These linearity tests can be listed as The BDS test and the McLeod – Li test. The mentioned models are compared at the end of the study. The fitted models are used to predict the remaining data and compute the forecast errors. Then, the models are compared according to compute the root mean squares of forecast errors and the mean absolute forecast errors.*

**Keywords:** Nonlinear Modelling, TAR, Markov-Switching, BIST-100

**JEL Codes:** C4, C52, C58

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## 1. INTRODUCTION

In time series modelling, the information available in the lagged values of a variable such as  $y_t$  is very useful in predicting the future values of the  $y_t$  variable. In particular, a statistical model that reflects this idea has been tried to be estimated by autoregressive processes. In the autoregressive (AR) models introduced to the literature by Yule (1927), the current value of the variable examined is defined as a linear function with previous values of the process and a shock. Although AR (1) models are sufficient to explain many economic time series, more general autoregressive models with a delay value such as AR (p) may be required for some series. It is possible to summarize the general features of AR models as follows:

- All lagged values of  $y_t$  on the right-hand side of the equation have a cumulative effect on  $y_t$ . Therefore, it can be said that AR models have a long-term memory.
- Since the correlation between meat and  $y_t$  is zero, AR models can be estimated by the Least Squares Method (OLS).
- Partial Autocorrelation Function (PACF) of an AR (p) process theoretically takes the value of zero after p delay, and its ACF decreases exponentially.

AR(p) model can be expressed as following

$$y_t = \phi_0 + \phi_1 y_{t-1} + \phi_2 y_{t-2} + \dots + \phi_p y_{t-p} + a_t = \phi_0 + \sum_{i=1}^p \phi_i y_{t-i} + a_t \quad (1)$$

where  $a_t$  is a white noise series and  $p \in \mathbb{Z}^+$ .

Another time series structure form, called the moving average process, is also used to explain the behavior of many financial data. MA(q) model as following

$$y_t = c_0 + a_t - \theta_1 a_{t-1} - \theta_2 a_{t-2} - \dots - \theta_q a_{t-q} = c_0 + a_t - \sum_{i=1}^q \theta_i a_{t-i} \quad (2)$$

Since MA models are a finite linear combination of stationary series (white noise series), which are weakly stationary.

Separate Autoregressive processes and Moving Average (MA) processes fail to explain the dynamic structure of time series and face various difficulties. Because these models need many parameters when explaining the dynamic structure of the time series. In this case, it makes the models cumbersome and makes parameter estimation difficult. Box et al. (1994) introduced ARMA models to overcome this challenge. Thus, autoregressive processes and moving average processes were collected in a single compact structure and the number of parameters was kept to a minimum. The model is

useful for modelling business, economic and engineering time series. A general ARMA( $p, q$ ) model is in the form

$$y_t = \phi_0 + \sum_{i=1}^p \phi_i y_{t-i} + a_t - \sum_{i=1}^q \theta_i a_{t-i} \quad (3)$$

where  $a_t$  is a white noise series and  $p, q \in \mathbb{Z}^+$ . It can be concluded from this point of view that AR and MA processes are special cases of the ARMA( $p, q$ ) model (Tsay, 2012).

Two important assumptions of linear time series models; all series are stationary (or stabilized by various operations) and linear (observed data can be expressed as a linear function of current and historical data). Despite these limitations, the continued popularity of linear time series models in the time series literature indicates that linear models have significant benefits when analyzing time series. However, in reality, most of the time the series is not linear and linear models are not successful in revealing and modeling the properties of such series. Since economic variables are under the influence of different dynamics in different stages of the economy such as development and stagnation, they have different characteristics in these periods. These variables, which cannot be modeled with linear time series models, are tried to be modeled with regime change models. Nonlinear time series models frequently used in applications can be listed as Nonlinear Autoregressive Models, Volterra Expansion Models, Bilinear Models, Generalized Autoregressive Models and Exponential Autoregressive Models, which are beyond the scope of this study. Until now, the most used linear and nonlinear time series applications were briefly mentioned. The purpose of this study is to examine some of the linearity tests and then estimate the BIST-100 index returns using models such as Threshold AR and Markov Regime Shift. For this purpose, Brock-Dechert-Schienkman (BDS) and McLeod - Li tests will be mentioned in the next section. In the third part, the mentioned models will be introduced briefly. Findings and results will be given in the last section.

## **2. NONLINEARITY TESTS**

Among the tests used to test the linearity of the series examined in this part of the study, the most used tests in applications are BDS and McLeod – Li tests.

▪ The BDS test, introduced by Brock et al. (1987, 1996), is a non-parametric test that is often used to measure the nonlinear dependence of time series. The BDS test is also known as the independence test that examines the relationship between a time series and past values. The BDS test statistic is calculated based on the correlation integral calculated in different dimensions. The fact that the correlation integral is sensitive to all kinds of linearity makes this test powerful. It is a test applied to error terms obtained from linearly established models. The null hypothesis of the BDS test is that

the error terms of the series have an independent and identical distribution, in other words, that the error terms are not linearly distributed. The BDS test is based on the correlation integral. This integral is used to measure the frequency of repetitive irregular movements in the series. Brock, Hsieh, and LeBaron (1991) found that the BDS test was more successful in a large sample size as a result of Monte-Carlo simulations.

▪ The McLeod-Li test, provided by McLeod and Li (1983) to the literature, is a Portmanteau test that tests linearity by examining the Box-Pierce Q statistics of squared residuals obtained from an ARMA process. The Q statistics can be calculated expressing the autocorrelation function of the squares of the residual estimators obtained at the end of the ARMA modeling process. The Q statistics fits to chi-square distribution with degrees of freedom equals to lag length. If the calculated Q statistics greater than the critical value, the basic hypothesis showing that the residuals are independent will be rejected and the alternative hypothesis showing that there is a dependency between residuals will be accepted. This situation shows that the studied time series does not have linear properties.

### 3. NONLINEAR MODELS

In this part, some univariate nonlinear time series models are introduced briefly, and their properties and their applications are discussed and demonstrated. The models introduced include threshold autoregressive (TAR) models and Markov switching models (MSM).

#### 3.1. Threshold AR Model

Threshold AR (TAR) model is an extension of the piecewise linear regression model with structural changes occurring in the threshold space. In the time series literature, the TAR model was proposed by Tong (1978) and has been widely used since the publication of Tong and Lim (1980). TAR models, which were studied in detail by Tong (1990), are attractive nonlinear extensions of linear autoregressive models and econometrically solvable. The reason why TAR models are so popular in the nonlinear time series literature; It is easier to identify, estimate and interpret than other nonlinear time series models. A time series  $y_t$  follows a two-regime TAR model of order  $p$  with threshold variable  $y_{t-d}$  if it satisfies

$$y_t = \begin{cases} \phi_0 + \sum_{i=1}^p \phi_i y_{t-i} + \sigma_1 a_t, & \text{if } y_{t-d} \leq r \\ \theta_0 + \sum_{i=1}^p \theta_i y_{t-i} + \sigma_2 a_t, & \text{if } y_{t-d} > r \end{cases} \quad (3.1)$$

where  $a_t$  is a sequence of iid random variables with mean zero and unit variance,  $\theta_i$  and  $\phi_i$  are real-valued parameters such that  $\theta_i \neq \phi_i$  for some  $i$ ,  $d$  is a positive integer denoting the delay, and  $r$  is

the threshold. Often, it is further assumed that  $a_t$  follows  $N(0, 1)$ . The same order  $p$  for both regimes is used. This is purely for simplicity as different orders can easily be used. The parameter estimation of TAR models is often carried out by the nonlinear least squares method. TAR models can model many nonlinear characteristics such as the asymmetry observed in the increase/decrease patterns of processes belonging to rapidly changing macroeconomic variables. For the details, one can see the (Tsay, 2019).

### **3.2. Markov Switching Model**

The Markov chain consists of independent random variables. The basic idea of the Markov Switching Model (MSM) is to explain the stochastic process that determines the change from one state or regime to another through a Markov chain. The Markov chain is used to model the behavior of a state variable or combination of variables and it determines which regime is present and cannot be directly observed. In the MSM, the state of the process cannot be directly observed. The time series variable expressed as  $y_t$  can be observed. The state of the process in each period is obtained as probabilistic by using the observation values assumed to be dependent on the regime of its properties. Let  $S_t$  denote the state of the process at time  $t$ . For a two-state Markov switching model (MSM),  $S_t$  assumes two possible values. When the state of the macroeconomical variable  $S_t = 1$  is obtained in the Markov process,  $S_t = 2$  expressing the next period and other regimes are obtained based on the transition probability. For instance;  $S_t = 1$  represents expansion and  $S_t = 2$  represents contraction. Two-regime MSM can be expressed as following

$$y_t = \begin{cases} \phi_{0,1} + \phi_{1,1}y_{t-1} + \dots + \phi_{p,1}y_{t-p} + \sigma_1 a_t, & \text{if } S_t = 1 \\ \phi_{0,2} + \phi_{1,2}y_{t-1} + \dots + \phi_{p,2}y_{t-p} + \sigma_2 a_t, & \text{if } S_t = 2 \end{cases} \quad (3.2)$$

where  $\phi_{i,j}$  are real numbers,  $\sigma_i > 0$ , and  $a_t$  is a sequence of iid random variables with mean zero and variance 1.0.

In MSM, the transition probabilities depend on the intrinsic variable and are a function of the observed time series vector and depend on the last regime. In addition, the possibility of staying in regime 2 and the possibility of transition from regime 1 to regime 2 is different from each other.

MSMs were first included among nonlinear time series in 1989 with Hamilton's work. Hamilton analyzed the fluctuations in the economy with the MS-AR model. The literature on nonlinear time series has developed very close to this model that Hamilton applied to the business cycle in his 1989 article. In the first studies in which time series were tested with nonlinear models, Tong (1990) explained regime changes with the observed value being below or above a calculated threshold value, while rapidly changing volatility in markets, sudden jumps in time series, dependence on frequency

width, loop limits can not be explained by linear methods. properties have led to the development of nonlinear methods. In the following years, Chen and Tsay (1991, 1993), Tsay and Chen (2019), Tsay (1989, 1998) has been a pioneer for many researchers.

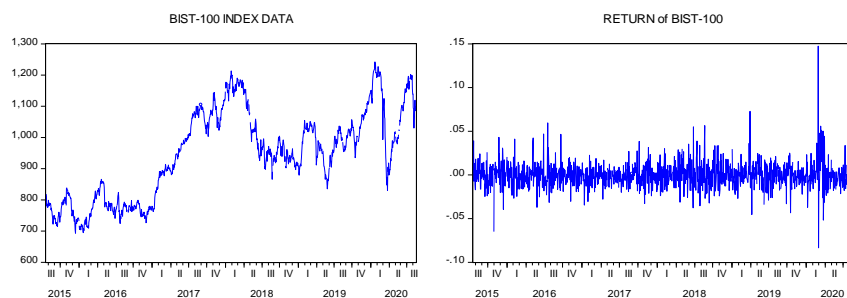
In the first example of the MSM, Hamilton modeled the US real Gross National Product (GNP) data, arguing that the transition of the economy to periods of expansion and contraction is a Markov process. The regimes described in Hamilton's study are different from the regimes in the study of Neftçi (1984), who modeled the asymmetric behavior of the US unemployment rates observed as rapid rise (regime 1) and slow decline (regime 2) in a Markov process. While Neftçi defines the periods when the unemployment rate rises and the economy shrinks in other words as regime 1, Hamilton stated that the unobservable regime is one of the factors that affects only the output level in the economy and that the output level may decrease while the economy is in the process of rapid growth.

MSMs are successful in capturing features such as the thick tail, varying variance and skewness of financial time series. In financial time series, the transition between regimes is generally smooth, and variance becomes an important factor in separating regimes. For example, when compared to the periods when the stock markets are in an average growth process, it is observed that the changes in prices accelerate and volatility increases in the periods when optimistic expectations for the future increase (bull market). The periods in which pessimistic expectations about the future increased (bear market), on the other hand, stand out with higher increases in volatility compared to the optimistic periods.

#### **4. DATA AND FINDINGS**

The data used in this study is the Istanbul Stock Exchange BIST-100 index data and includes daily data between 2015-2020. The time-series graph of the BIST-100 index and index returns is given in Figure 1.

**Figure 1. Time-Series Plot of BIST-100 Index Data and the Return of BIST-100 Index**





Stationarity analysis of the BIST-100 index and index returns are performed using Philips-Perron (PP) and Augmented Dickey-Fuller (ADF) tests and the results are given in Table 1. When the results of the stationarity tests are examined, it is concluded that the index returns are a stationary series.

**Table 1. Unit Root Tests of BIST-100 Index Data and the Return of BIST-100 Index**

UNIT ROOT TEST TABLE					
		PP		ADF	
		BIST	RBist	BIST	RBist
With Constant	t-Statistic	-1.7444	-37.0919	-1.7536	-24.2683
	Prob.	0.4086	0	0.4039	0
		n0	***	n0	***
With Constant & Trend	t-Statistic	-2.5938	-37.078	-2.575	-24.2588
	Prob.	0.2833	0	0.292	0
		n0	***	n0	***
Without Constant & Trend	t-Statistic	0.3109	-37.1024	0.3131	-24.274
	Prob.	0.7754	0	0.776	0
		n0	***	n0	***

Notes: (\*\*\*) Significant at the 1%. and (n0) Not Significant

BDS and Mcleod-Li nonlinearity tests show that BIST\_100 returns do not show linearity feature. Therefore, nonlinear models can be used in this data set. An important point to note in the results given in Table 2 is that if the Box-Ljung test is applied to the squares of the residuals, it will be equivalent to the Mcleod-Li test.

**Table 2. Nonlinearity Tests**

BDS Test for RBist				
Dimension	BDS Statistic	Std. Error	z-Statistic	p-value
2	0.011442	0.002389	4.788520	0.000
3	0.023063	0.003790	6.084979	0.000
4	0.032431	0.004505	7.199230	0.000
5	0.036327	0.004686	7.751780	0.000
6	0.036168	0.004511	8.017954	0.000
Mcleod-Li Test for RBist				
Data: Squared of RBist			Test: Box-Ljung test	
Chi-Squared: 161.65		Degrees of Freedom: 10		p-value: < 2.2e-16

According to Table A1 given in Appendix A, the best TAR model is a 3-regime model. In order to simplify the study, a 2-regime TAR model, in which the 6th lagged value of the BIST-100 index returns is the threshold value, was adopted. In addition to simplification, such a route was chosen because the MS-AR model is also 2-regime. The outputs of TAR and MS-AR models are given in Appendix A and Appendix B, respectively. As for the main purpose of the study, the comparison of the forecasting performance of the mentioned models is given in Table 3.

**Table 3. Forecasting Performance of TAR and MS-AR**

Model	RMSE	MAE	TIC	SMAPE
TAR	0.014619	0.010305	0.965583	183.227
MS-AR	0.014620	0.010301	0.990012	199.6384

When Table 3 is examined, it is seen that Root Mean Square Error (RMSE), Theil Inequality Coefficient (TIC) and Symmetric Mean Absolute Percentage Error (SMAPE) values are lower for the 2-regime TAR model. Only MS-AR model's Mean Absolute Error (MAE) value is lower. Therefore, it can be said that the 2-regime TAR model is better than the MS-AR model at predicting the BIST-100 index returns.

## **5. DISCUSSION**

Nonlinear time series models, which are frequently used in time series literature, can be successful in explaining many events that are not captured by linear models. Regime change models, one of the non-linear time series models, allow the examined variable to take place in different regimes managed by different dynamics, depending on the course of the time series. In this study, it can be developed using models such as tvAR, SETAR, STAR, TVAR and MS-VAR, and by looking at the ARCH effect on residuals, the shocks present in the BIST\_100 index returns can be modeled with volatility models such as TGARCH, MSGARCH and MCSGARCH.

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**APPENDIX A**

**Table A1. TAR Model Selection**

Model Selection Criteria Table			
Sample: 7/21/2015			
Dependent Variable: RBist 8/19/2020		Included observations: 1265	
Threshold Variable	SSR	Regimes	
RBist (-4)	0.249405	3	
RBist (-7)	0.252099	3	
RBist (-2)	0.252909	3	
RBist (-6)	0.259458	2	
RBist (-5)	0.260465	2	
RBist (-3)	0.267061	1	

**Table A2. TAR Model Output**

Dependent Variable: RB				
Method: Discrete Threshold Regression				
Threshold variable: RB(-6)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RB(-6) < 0.006265039 -- 930 obs				
RB(-1)	0.044467	0.036405	1.221450	0.2221
RB(-2)	0.106757	0.032769	3.257878	0.0012
RB(-3)	0.006640	0.034226	0.194007	0.8462
RB(-4)	0.012344	0.035616	0.346577	0.7290
RB(-5)	0.043340	0.034843	1.243874	0.2138
RB(-6)	0.019520	0.050261	0.388375	0.6978
RB(-7)	-0.030624	0.032127	-0.953229	0.3407
RB(-8)	0.077470	0.033498	2.312700	0.0209
RB(-9)	-0.019477	0.032813	-0.593570	0.5529
RB(-10)	0.047504	0.033152	1.432925	0.1521
RB(-11)	-0.033124	0.035556	-0.931600	0.3517
0.006265039 <= RB(-6) -- 335 obs				
RB(-1)	-0.161011	0.044491	-3.618970	0.0003
RB(-2)	-0.084506	0.055713	-1.516806	0.1296
RB(-3)	0.030623	0.050052	0.611820	0.5408
RB(-4)	0.011284	0.046776	0.241233	0.8094
RB(-5)	-0.110671	0.049295	-2.245073	0.0249
RB(-6)	-0.011587	0.043779	-0.264663	0.7913
RB(-7)	-0.075596	0.062304	-1.213349	0.2252
RB(-8)	-0.002387	0.053621	-0.044510	0.9645
RB(-9)	-0.046404	0.057204	-0.811209	0.4174
RB(-10)	-0.044847	0.056543	-0.793151	0.4278
RB(-11)	0.063290	0.048224	1.312399	0.1896
Non-Threshold Variables				
C	1.05E-05	0.000529	0.019757	0.9842
R-squared	0.040140	Mean dependent var		-0.000183
Adjusted R-squared	0.023137	S.D. dependent var		0.014624
S.E. of regression	0.014453	Akaike info criterion		-5.617747
Sum squared resid	0.259458	Schwarz criterion		-5.524241
Log likelihood	3576.225	Hannan-Quinn criter.		-5.582616
F-statistic	2.360825	Durbin-Watson stat		2.007485
Prob(F-statistic)	0.000392			

**APPENDIX B**

**Table B1. Markov Switching AR Model Output**

Dependent Variable: BIST-100 RETURN				
Method: Markov Switching Regression (BFGS / Marquardt steps)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
Regime 1				
RB(-1)	1.345309	0.179848	7.480259	0.0000
RB(-2)	-1.582777	0.401345	-3.943687	0.0001
RB(-3)	-0.035201	0.223037	-0.157826	0.8746
RB(-4)	-2.028565	0.227101	-8.932444	0.0000
RB(-5)	3.634973	0.273401	13.29541	0.0000
RB(-6)	2.180192	0.157972	13.80110	0.0000
RB(-7)	-1.079236	0.397721	-2.713548	0.0067
RB(-8)	0.580956	0.145936	3.980895	0.0001
RB(-9)	-2.550167	0.246433	-10.34832	0.0000
RB(-10)	-0.093083	0.144114	-0.645899	0.5183
RB(-11)	-0.846934	0.204282	-4.145904	0.0000
Regime 2				
RB(-1)	-0.050490	0.025824	-1.955141	0.0506
RB(-2)	0.018668	0.026104	0.715116	0.4745
RB(-3)	0.010217	0.025730	0.397068	0.6913
RB(-4)	0.004444	0.026556	0.167327	0.8671
RB(-5)	-0.048117	0.025832	-1.862726	0.0625
RB(-6)	-0.022547	0.027145	-0.830602	0.4062
RB(-7)	-0.027999	0.025573	-1.094866	0.2736
RB(-8)	-0.000185	0.028006	-0.006603	0.9947
RB(-9)	-0.004333	0.026891	-0.161148	0.8720
RB(-10)	-0.015088	0.026864	-0.561632	0.5744
RB(-11)	-0.002410	0.027316	-0.088235	0.9297
Common				
LOG(SIGMA)	-4.376721	0.021412	-204.4041	0.0000
Transition Matrix Parameters				
P11-C	-2.510475	1.041951	-2.409399	0.0160
P21-C	-3.831812	0.264465	-14.48893	0.0000
Mean dependent var	-0.000183	S.D. dependent var		0.01462
S.E. of regression	0.014931	Sum squared resid		4
Durbin-Watson stat	2.024718	Log likelihood		0.27688
Akaike info criterion	-5.736943	Schwarz criterion		9
Hannan-Quinn criter.	-5.698757			3653.61
				7
				-
				5.635307

**DETERMINANTS OF THE SHADOW ECONOMY. A STUDY ON POST-COMMUNIST EU  
MEMBER STATES**

**Raluca Irina Clipa, Associate Professor PhD (<sup>1</sup>), Mihaela Brindusa Tudose, Lecturer PhD (<sup>2</sup>),  
Ionel Bostan, Professor PhD (<sup>3</sup>), Flavian Clipa, PhD (<sup>4</sup>)**

<sup>1</sup> Alexandru Ioan Cuza University, Iasi, Romania, e-mail. riclipa@gmail.com, <https://orcid.org/0000-0002-0214-9568>

<sup>2</sup> Gheorghe Asachi Technical University of Iasi, Romania, e-mail. brindusa.tudose@tuiasi.ro, <https://orcid.org/0000-0003-0927-1846>

<sup>3</sup> Stefan cel Mare University, Suceava, Romania, e-mail. ionel.bostan@fdsa.usv.ro, <https://orcid.org/0000-0002-7653-7192>

<sup>4</sup> Romanian Court of Accounts, Iasi, Romania, e-mail. flaclipa@yahoo.com, <https://orcid.org/0000-0002-7310-6768>

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**ABSTRACT**

*The formation and development of the shadow economy is the result of a complex phenomenon generated by certain different economic, social and political circumstances. Although in terms of theoretical debates it is admitted that the shadow economy is correlated (directly or indirectly) with a number of macroeconomic variables, the results of empirical research reveal that there is still not enough convergent evidence. The paper assumes the objective of assessing the influence of the gross domestic product growth rate (GR), the general government gross debt (GggD) and the unemployment rate (UR) on the shadow economy (SE). In order to minimize the risks associated with the heterogeneity of the sample, we performed the analysis on 11 post-communist EU member states for the period 2007-2015. For the empirical evaluation of the nature and intensity of the relationships between the dependent variable (SE) and the independent variables (GR, GggD, UR) we assumed hypotheses and performed correlation and regression analyzes. The first hypothesis tested that there is an inverse relationship between GR and ES, meaning that with economic growth the size of the underground economy is expected to decrease. Descriptive statistics, doubled by the analysis of the annual compound growth rate, revealed a reduction in both GR and SE. The second hypothesis was developed to test whether there is a direct relationship between Gggd and SE explained by the fact that a reduction in GggD may indicate a reduction in SE. The third hypothesis tested whether there is*

*a direct relationship between UR and SE, meaning that a reduction of unemployment can be admitted as evidence of the intensification of legal activities in the economy and, implicitly, the reduction of the shadow economy. The results of the correlation analysis showed that there is a weak numerical association between SE and GR and 65.6% of the SE variation is explained by the GggD variation. The regression analysis provided data that rejected two of the three hypotheses. The only validated hypothesis indicated a direct but insignificant impact of the UR on the SE.*

**Keywords:** *Shadow Economy, Post-communist Countries, Growth Rate, Government Debt, Unemployment.*

**JEL Codes:** *E26, H26, O17*

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## **1. INTRODUCTION**

Considering the definitions of shadow or informal economy found in the literature in the field, this concept could be defined as all unregistered or undeclared economic activities with a negative economic (damaging well-functioning of the economy and reducing GDP) and social (in terms of social equity) impact on economy (Tudose and Clipa, 2016).

During the 2000s, the average size of a shadow economy varied from 19% of GDP in OECD countries, 30% in transition economies and 45% in developing countries (Schneider and Enste, 2013). In the first half of the following decade the informal economy went on a downward trend with different rates in almost all EU member countries (Schneider, 2015). Although empirical research on the determining factors of shadow economy has grown rapidly (Feld and Schneider, 2010; La Porta and Shleifer, 2008; Schneider, 2017; Schneider and Enste, 2000; Williams and Schneider, 2016), causes and size of informal sector in the former communist states has remained insufficiently studied, except some papers that focuses on a single-country analysis (e.g., Popescu, Davidescu, and Huidumac, 2018) or other studies that investigated the relationship between the state failure and institutional quality and path dependence in post-communist world (e.g., Iacobuta and Pohoata, 2015).

Informal sector determining factors should be taken into account when developing growth policies for economic systems in transition due to profound changes in the economy. In this regard, Mursa, Isan, and Ifrim (2014) showed that transformations of Eastern European economies generated new causes for the existence of informal markets: excessive taxation, low confidence in new institutions, corruption and low tax morale.

This paper attempts to provide an explanation for the dynamics in growth, government debt and unemployment in the shadow economy in post-communist economies. For this purpose, we conducted a study investigating the relationship between Real gross domestic product (GDP) growth rate (GR), General government gross debt (GggD) and Unemployment rate (UR) as independent variables and the Shadow economy (SE) as a dependent variable, for a group of 11 post-communist countries, currently members of EU, for the period 2007-2015. Our study uses data estimated by Schneider (2015) and the instruments of the Multiple Indicator Multiple Causes (MIMIC) model.

The paper is divided into five sections. In the next section, we reviewed the literature and formulated the hypotheses. The third section presents the methodology used for the empirical analysis, as well as the study database. In the fourth section, we present the empirical results and explain the causality. The fifth section discusses the results and the last section presents the conclusions.

## **2. THEORETICAL FRAMEWORK AND HYPOTHESES**

Over the years, researchers have paid a special attention to shadow economy, several studies being conducted on its estimated size and causes. Broadly, the determinants of shadow economy are economic, political (regulatory) and institutional (La Porta and Shleifer, 2008, 2014; Medina and Schneider, 2017; Schneider, 2015, 2017; Williams and Schneider, 2016) and include fiscal pressure and morals, social and cultural system, quality of public institutions, regulation, international context, peculiarities of local governance.

In the literature that examined the relationship between economic growth and shadow economy, the general explicit or implicit opinion was that informal economy shrinks with economic growth, development of financial and public sectors, increase in the quality of institutions and regulatory effectiveness.

However, the relationship between economic growth and informal economy has been controversial. While some researchers estimated a positive relationship between official and unofficial economy by conducting studies focused on developed countries (Adam and Ginsburgh, 1985; Enste, 2018; Giles, Tedds, and Werkneh, 2002; Schneider, Chaudhuri, and Chatterjee, 2003; Tedds, 1998), or on developing economies (Alañón and Gómez-Antonio, 2005; Zaman and Goschin, 2015), others (Dell'Anno, Gómez-Antonio, and Pardo, 2007; Dell'Anno and Schneider, 2003; Frey and Weck-Hannemann, 1984; Ihrig and Moe, 2004; Kaufmann and Kaliberda, 1996; Loayza, 1996; Schneider and Enste, 2000) found an inverse trend between these variables, the latter correlation being also found for transition countries (Eilat and Zinnes, 2000).



Contrary to this conclusion, Wu and Schneider (2019) found a long-run nonlinear relationship between shadow economy and growth, described by a U-shaped curve, which means that shadow economy shrinks as the economy grows, but it tends to increase when economic development surpasses a given threshold, or at least does not disappear.

On the other hand, in an attempt to explore the nonlinear impact of shadow economy on economic growth, and collecting data from 161 advanced and emerging market economies for the period from 1950 to 2010, Elgin and Birinci (2016) found an inverted-U curve between the shadow economy and growth of GDP per capita. Their findings mean that countries with small and large informal economy are associated with little growth, while countries with medium shadow economy are associated with higher levels of growth.

In this study, we depart from the assumption that post-communist countries have not exceeded the turning point of the U-curve in Wu and Schneider (2019) model and they are in their downward phase, with the decline of shadow economy (SE) and the Real GDP growth rate (GR). The first hypothesis of our analysis is that the increase of GR, measured by real GDP growth rate, causes a reduction of SE.

A higher percentage of underground economy discourages tax collection, reduction in shadow economy being therefore associated with higher revenue for the state budget. Some researchers quantify this inverse proportional relationship by increasing by 0.125 percent of tax-to-GDP ratio at each reduction with 1 percent of the underground economy-to-GDP ratio (Awasthi and Engelschalk, 2018). The role of shadow economy and corruption as determinants of public debt have been reported in the literature (Elgin and Uras, 2013; González-Fernández and González-Velasco, 2014). But is the vice versa valid? It may be a case of vicious circle: informal economy increase governmental debt, which reduces the quality of goods and services provided by the government leading to lower tax morale and poor trust in government, which in turn, leads to larger shadow economies. Torgler and Schneider (2009) found strong support that higher tax morale and higher institutional quality lead to the diminishing of governmental debt and consequently to a smaller shadow economy. We try to shed more light into this issue by analyzing the relationship between General government gross debt (GggD) as independent variable and shadow economy (SE) as a dependent variable for the post-communist EU member states. The second hypothesis of this study is that the rise in GggD leads to an increase of SE and vice versa.

The relationship between informal economy and the unemployment rate is considered ambiguous, the two variables being weakly correlated one to another (Tanzi, 1999). Institutional quality has a great impact on the relationship between unemployment rate and SE. In countries with a

strong institutional quality, the unemployment rate is not associated with the growth of the informal sector. In contrast, in countries with low institutional quality, unemployment rate determines the expansion of the underground economy. The latter is the case of post-communist economies. The causal links between the shadow economy and the unemployment rate was recently explored by Sahnoun and Abdennadher (2019) using a dynamic simultaneous-equation panel data model for 38 developing and 40 developed economies for the period between 2000 and 2015. They concluded that there is a unidirectional and negative causality running from the unemployment rate to the shadow economy in the developing countries and a bidirectional and negative causal relationship between the two variables in the developed countries.

The size of unemployment rate is closely correlated with labor regulations. Blanton and Peksen (2019) analyzed the impact of labor laws on illicit economic activity and found that labor regulations are one of the key incentives associated with formal work, this conclusion supporting again the importance of institutional strength for reducing the size of informal sector. Starting from these empirical studies, we have formulated the third hypothesis we intend to test for the selected countries: decrease of UR leads to a decrease of SE.

### **3. METHODOLOGY USED FOR THE EMPIRICAL ANALYSIS. SAMPLE AND DATA**

The analysis considers a sample of 11 post-communist countries that joined the EU. Poland was the first country that abandoned the communist regime (1989). Hungary, Bulgaria and Romania followed the same year. With the collapse of the Soviet Union (1991), Estonia, Latvia and Lithuania had regained their independence. In 1992, Croatia broke away from Yugoslavia. Also in 1992, three years after abandoning communist regime, the Czech Republic and Slovakia were the result of a peaceful division of Czechoslovakia. The first countries meeting the EU accession criteria (including the existence of a functioning market economy) were the Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovenia, Slovakia and Hungary in 2004. Three years later, Romania and Bulgaria joined the EU, Croatia joining in 2013.

The analyzed variables, determined annually included Shadow economy (SE) as dependent variable, estimated based on MIMIC model (Schneider, 2015), and the independent variables Real GDP growth rate (GR), General government gross debt (GggD), Unemployment rate (UR) and were extracted from the Eurostat database.

The measurement of GDP growth rate was made on the basis of chain-linked series, which allowed the elimination of the influence of price variation. GggD was calculated as a ratio between end-of-year outstanding public debt and gross domestic product at current prices. UR is the number of unemployed persons as a percentage of the labor force based on the International Labor Office (ILO)

definition. The research is limited to the period 2007-2015 due to lack of SE estimates by the MIMIC method after 2015.

For the empirical evaluation of the nature and intensity of the relationships between the two groups of variables, we have used correlation and regression analyses. The study aims to test the following research hypotheses:

H1. In this sample, there is an inverse relationship between GR and ES. As evidence of economic growth is recorded, we expect the size of underground economy to decrease. SE is expressed as the percentage ratio of shadow economy to official GDP, identical to Wu and Schneider (2019).

H2. In this sample, there is a direct relationship between GggD and ES. In other words, with the removal of activities / operations / revenues / earnings from taxation, we are witnessing growth of underground economy. This tax evasion negatively affects public budgets; for balancing budgets, governments are obliged to borrow.

H3. In this sample, there is a direct relationship between UR and ES. Increase of employment rate (respectively, reduction of the number of unemployed) is a proof of the intensification of legal activities in the economy. As a result, we expect a reduction of UR to cause a SE reduction.

#### **4. EMPIRICAL RESULTS AND EXPLANATION OF CAUSALITY**

##### **4.1. Shadow economy and real GDP growth rate**

In 2007, Bulgaria, Romania, Croatia, Lithuania and Latvia were the countries with the largest share of underground economy in GDP (over 30%). This shows that the three last countries that joined the EU faced most significant challenges in terms of informal economy. Only one country had maintained similar level (Bulgaria) by the end of 2015. During this period, the average\_SE amounted to 26.5%. CAGR (compound annual growth rate) indicates a decrease of informal sector for all countries in the sample (the average rate being 1.2%) (table 1). The highest efficiency of the measures aimed to reduce the share of shadow economy was recorded in the Czech Republic (for which the rate of decline of SE is 1.9%). At the opposite pole is Estonia, which recorded a decline of SE by only 0.8%. By the end of 2015, minimum thresholds of underground economy had been recorded in all countries except Bulgaria, Estonia and Slovakia.

Table 1. Shadow Economy (SE)

Countries	Dynamics	Descriptive statistics				
		Min	Max	Average	Median	CAGR
Bulgaria		32.1	35.9	33.5	32.7	-1.2
Czech Republic		16.4	19.5	17.6	17.0	-1.9
Estonia		20.2	30.7	27.5	29.3	-0.8
Croatia		29.5	32.3	30.7	30.4	-1.0
Latvia		26.5	30.4	28.1	27.5	-1.5
Lithuania		29.0	32.0	30.3	29.7	-1.1
Hungary		22.8	25.0	23.9	23.7	-1.0
Poland		25.0	27.7	26.3	26.0	-1.1
Romania		29.4	33.6	30.9	30.2	-1.5
Slovenia		24.0	26.7	25.2	24.7	-1.1
Slovakia		16.0	18.4	17.1	16.8	-1.5
Average	-	-	-	26.5	-	-1.2

Source: Processing of Schneider (2015) data. The black dots show the highest / lowest values of the axis.

Table 2. Real GDP Growth Rate (GR)

Countries	Dynamics	Descriptive statistics				
		Min	Max	Average	Median	CAGR
Bulgaria		-3.6	7.3	2.1	1.8	-7.8
Czech Republic		-4.8	5.6	1.6	2.3	-0.6
Estonia		-14.7	7.7	0.9	2.3	-14.4
Croatia		-7.3	5.3	-0.3	-0.3	-8.4
Latvia		-14.4	10.0	0.7	2.4	-12.5
Lithuania		-14.8	11.1	2.1	3.5	-17.3
Hungary		-6.6	4.2	0.6	0.9	27.2
Poland		1.4	7.0	3.6	3.6	-6.6
Romania		-5.5	9.3	2.4	3.4	-6.6
Slovenia		-7.5	7.0	0.7	1.3	-12.1
Slovakia		-5.4	10.8	3.2	2.8	-10.0
Average	-	-	-	1.6	-	-6.3

Source: Processing based on Eurostat database. The black dots show highest / lowest values of the axis.

The analysis of real GDP growth rate indicated that all countries had positive growth rates in the first year of the analyzed period. These values were highest for the period in all countries, except Hungary and Romania. Although in average terms growth rate was positive, except Croatia, CAGR was negative in 10 of the 11 countries, except Hungary, indicating that the countries included in the sample had been unable to reach the level before crisis (table 2). After the analysis of data by period segments, we could note that had been a negative economic growth by 2009. In 2009, 10 of the 11 countries had the lowest levels of growth (negative values). After 2009, economic growth became positive. In the following period, average rates of economic growth were positive, except for Croatian economy.

According to data shown in tables 1 and 2, the first research hypothesis could be confirmed if we consider the effective rates of economic growth as there is an inverse relationship between

economic growth and size of underground economy. But we should be cautious about this first confirmation as the compound annual growth rates are negative.

#### **4.2. Shadow Economy and General Government Gross Debt**

The GggD analysis indicated that all countries had lowest values in 2007 and 2008. Since 2009, gross debt of the governments has increased, reaching their highest values for the period. From the debt rate of 25.8% in GDP in 2007, it grew to 49.1% (the average value of the period being 40.2%). In terms of compound annual growth, gross government debt has increased by 9% (Table 3).

**Table 3. General Government Gross Debt (GggD)**

Countries	Dynamics	Descriptive statistics				
		Min	Max	Average	Median	CAGR
<b>Bulgaria</b>		13.0	27.1	17.8	16.3	5.4
<b>Czech Republic</b>		27.5	44.9	37.6	39.8	4.2
<b>Estonia</b>		3.7	10.5	7.6	7.0	11.6
<b>Croatia</b>		37.3	84.0	62.6	63.9	9.4
<b>Latvia</b>		8.0	47.3	34.6	39.4	18.5
<b>Lithuania</b>		14.6	42.6	32.6	37.2	11.6
<b>Hungary</b>		65.5	80.5	76.1	77.2	1.8
<b>Poland</b>		44.2	55.7	50.9	51.3	1.7
<b>Romania</b>		12.0	39.2	29.1	34.2	13.6
<b>Slovenia</b>		21.8	82.6	50.2	46.6	15.4
<b>Slovakia</b>		28.5	54.7	43.6	43.7	6.3
<b>Average</b>	-	-	-	40.2	-	9.0

**Source:** Processing based on Eurostat database. The black dots show highest / lowest values of the axis.

Data shown in Tables 1 and 3 provide the first evidence that invalidates the second research hypothesis as the increase of GggD took place concurrently with the decrease of SE.

#### **4.3. Shadow Economy and General Unemployment Rate**

The period-level analysis indicates that ten of the 11 countries recorded lowest unemployment rates in 2007-2008. UR increased for most countries in the sample during the period 2009-2012. UR decreased in the final part of the period failing to reach the values of 2007-2009, except Hungary, with the lowest unemployment rate for 2015 (Table 4).

Analysis of data shown in tables 1 and 4 does not provide enough evidence to confirm or reject the third research hypothesis. Nor does the CAGR analysis indicate a clearer direction. The CAGR of UR analysis returned negative values (indicating a decrease) only for the Czech Republic, Hungary and Poland.

Table 4. Unemployment Rate (UR)

Countries	Dynamics	Descriptive statistics				
		Min	Max	Average	Median	CAGR
Bulgaria		5.6	13.0	9.6	10.3	3.2
Czech Republic		4.4	7.3	6.2	6.7	-0.4
Estonia		4.6	16.7	9.4	8.6	3.4
Croatia		8.6	17.4	13.3	13.7	5.6
Latvia		6.1	19.5	12.7	11.9	5.5
Lithuania		4.3	17.8	11.3	11.8	8.7
Hungary		6.8	11.2	9.2	10.0	-0.9
Poland		7.1	10.3	9.0	9.6	-2.7
Romania		5.6	7.2	6.7	6.8	0.7
Slovenia		4.4	10.1	7.6	8.2	7.0
Slovakia		9.6	14.5	12.7	13.2	0.3
Average		-	-	9.8	-	2.8

Source: Processing based on Eurostat database. The black dots show highest / lowest values of the axis.

## 5. RESULTS AND DISCUSSION

### 5.1. Results of Correlation Analysis

To assess the intensity of relations between the variables (in binary system), we calculated the Pearson and R square coefficient. The results indicated for the analyzed sample that the association between GR and SE (only 8.1% of the SE variation can be explained by the GR variation) is weak. The only exception is Estonia, for which the Pearson coefficient shows a strong association (0.92) between GR and SE (table 5).

Table 5. Correlation Analysis

Countries	Correlations (Pearson coefficient)			R square		
	GR-SE	GggD-SE	UR-SE	GR-SE	GggD-SE	UR-SE
Bulgaria	0.47	-0.54	-0.85	0.222	0.288	0.722
Czech Republic	0.07	-0.94	-0.38	0.005	0.881	0.146
Estonia	0.92	0.29	-0.05	0.843	0.083	0.003
Croatia	0.17	-0.95	-0.93	0.029	0.905	0.871
Latvia	-0.14	-0.73	-0.29	0.020	0.534	0.085
Lithuania	-0.06	-0.94	-0.45	0.003	0.890	0.205
Hungary	-0.34	-0.67	-0.17	0.112	0.45	0.030
Poland	0.54	-0.68	-0.16	0.286	0.459	0.026
Romania	0.11	-0.96	-0.66	0.011	0.925	0.432
Slovenia	0.24	-0.89	-0.93	0.055	0.784	0.863
Slovakia	0.33	-0.93	-0.55	0.109	0.867	0.307
Total sample	0.29	-0.88	-0.51	0.081	0.768	0.262
Legend	Correlation	Strong	moderate	weak	very weak	

The analysis of GggD and SE indicated a strong association between the two series of data, 76.8% of the variation of the underground economy could be explained by the variation of GggD. Regarding UR and SE, we identified a moderate (negative) association, only 26.2% of SE variation could be explained by UR variation.

## 5.2. Regression Analysis Results

To estimate the SE variation when modifying the independent variables (GR, GggD and UR), we performed two regression analyses (simple linear and multiple). In the simple linear regression analysis, we identified the extent to which the ES variance is explained separately, by the variance GR, GggD, and UR, respectively (table 6).

**Table 6. Simple Regression Analysis: ES-GR, ES-GggD, ES-UR**

	ES-GR	ES-GggD	ES-UR
Multiple R	0.225626	0.810216	0.187151
R Square	0.050907	0.65645	0.035025
Standard Error	0.692478	0.416626	0.698248

The results of simple regression analysis showed that there is a weak numerical association between SE and GR; only 5% of the SE variation is explained by the GR variation. Regarding SE and GggD, we found a strong numerical association (65.6% of the SE variation is explained by the GggD variation). The third simple regression analysis showed a very weak numerical association between SE and GR; only 3.5% of the SE variation is explained by the GR variation. These results converge with the results of the correlation analysis.

The multiple regression analysis, showing the impact of independent variable modification (GR, GggD and UR) on the dependent variable (SE), indicated that 76% of the SE variance is explained by the regression equation (table 7). The ANOVA section presents the value of the Fisher test (9.7799401) and its significance. As the calculated F (0.015599) is lower than the critical F (0.05), the regression model overall is significant (with the exception that specific coefficients may be insignificant).

**Table 7. Multiple Regression Analysis**

Regression Statistics		ANOVA				
			df	SS	MS	F
Multiple R	0.924332					
R Square	0.85439	Regression	3	6.141594	2.047198	9.779401
Adjusted R Square	0.767023	Residual	5	1.046689	0.209338	
Standard Error	0.457534	Total	8	7.188283		
Observations	9					
	Coefficients	Standard Error		t Stat		P-value
Intercept	29.32996	0.919111		31.91122		5.68E-07
GR	0.073956	0.045838		1.613414		0.167574
Gggd	-0.11007	0.024631		-4.46854		0.006588
UR	0.146844	0.121269		1.210892		0.280044

The second part of table 7 shows the estimated values for the model coefficients that allowed the regression equation to be formulated:

$$ES = 29.32996 + 0.073956GR - 0.11007GggD + 0.146844UR \quad (1)$$

The first term of the equation (29.32996) represents the SE level that is not determined by the three variables included in the analysis. The second term of the equation shows that there is a direct link between SE and GR (which negates hypothesis H1); according to the model, at an increase with one unit of GR, SE increases on average by 0.073956. The third term of the regression equation shows that there is an inverse relationship between SE and GggD, rejecting the H2 hypothesis.

The last term of the equation shows that there is a direct relationship between SE and UR and confirms hypothesis H3, but shows that the impact is insignificant. At a decrease with one unit of UR, it decreases on average by 0.146844 units. The resulting values “t State” and “p-value” indicate that only two coefficients are significant (one related to the free term and another linked to GggD).

### **5.3. Discussion**

Empirical analysis led us to a set of conclusion presented below. First, sample analysis showed that the average annual share of underground economy was 26.5% of GDP, with the average rate of economic growth of 1.6%, average rate of GggD of 40.2%, and average unemployment rate of 9.8%. Second, analysis of the compound annual growth rates indicated that Real GDP growth rate was negative for the whole analyzed period (average rate being -6.3%), general government gross rate debt increasing by 9%, unemployment rate growing by 2.8% and SE decreasing by only 1.2%. Third, correlation analysis (performed on the basis of average annual values) gave us the first clues for rejecting specific hypotheses. For our sample, analysis of the relationship between GR and SE indicates a weak association; showing, in contrast, a strong association for the relationship between GggD and SE; the third correlation analysis revealing a moderate association between UR and SE. Fourth, regression analysis invalidates two of the three assumed hypotheses. The results indicate that there is a direct relationship between SE and GR, and an inverse relationship between SE and Gggd. The third hypothesis has been partially validated, the results indicating only a weak positive impact of UR on SE.

Invalidation of the regression model can be explained by the fact that the correlation and regression analysis were made on the basis of average rates and not using compound annual growth rates (indicating different situations), and the analyzed period included the last crisis, being characterized by the alternation of increased and decreased rates of indicators.

Although the results of the empirical study invalidate the regression model, we consider that the study has proven its usefulness by contributing to the development of the current knowledge through its methodology that can be used as a research model in future studies aimed to identify the impact of the determinants of the underground economy. The lesson provided by this study is that a regression



model cannot be built on a sample for which annual average rates differ from average compound annual growth rates (CAGRs).

## **6. CONCLUSIONS**

Although the results of this study do not completely align with the findings reported in other studies, our findings open new research lines. The invalidation of the first hypothesis is contrary to mainstream finding that the informal economy shrinks with economic growth. Instead, our results converge with the findings of the study conducted by Wu and Schneider (2019) and can be explained by the fact that post-communist countries have surpassed a given threshold in their economic development, positioned at the beginning of the upward slope of the U-curve in this model. Also, our results comply with the finding of Elgin and Birinci (2016), the sample economies being at the bottom of the inverted-U curve, which means that a large informal economy is associated with little growth. The rejection of the second hypothesis indicates that in the post-communist countries the increase of public debt is not a consequence of low tax moral but of weak institutional quality and unhealthy macroeconomic policies. Low institutional quality of sample countries is also indicated by the validation of the third hypothesis, the reduction of unemployment rate generating a decrease of informal economy.

Additionally, this study concludes that although the economies in the sample had, as a temporal reference, the same starting point, the time of abandoning the communist system in the period 1989-1992, they show a different relationship between the level of underground economy and the determining factors. These conclusions could be useful in the development of economic policies.

The analyzed period was limited to the period for which data were available. The results of this study will be further verified and studied by redefining the analysis period (for which data will be made available) and by extending research to compound annual growth rates (CAGR) for both the dependent variable (SE) and the independent variables (GR, GggD, UR).

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**COMPARISON OF COST-EFFECTIVE RESIDENTIAL BUILDING RENOVATION  
REGARDS TO VERIOUS INSULATION**

**Ferdinand Ziegler, PhD Candidate <sup>(1)</sup>, Samira Aien, , PhD Candidate <sup>(2)</sup>**

<sup>1</sup> Mendel University, Brno, Czechia, e-mail. Fziegler@bauphysik-ziegler.de

<sup>2</sup> Technical University of Vienna, Austria, e-mail. Samiraaien.net@gmail.com

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**ABSTRACT**

*Since in Europe, 9 billion square meters of the residential stock have been built before 1975 with high-energy demand, applying a thermal insulation layer to existing facades can improve buildings' energy performance and consequently lead to decrease the energy costs, however there is still a challenge for investors to achieve more economical investment.*

*In this context, the present study investigated the effect of various insulation materials (EPS, PUR, Aerogel, ....) on energy consumption of a residential buildings using a simulation model, regards to achieve the energy efficiency standards for houses in Germany (KfW), that provides financing as a promoting energy-efficient housing institute for reconstruction.*

*In terms of cost payback period, the cost of raw material, living space (regards to the thickness of insulation) and installation were considered as effective parameters, which significantly influences the initial investment.*

**Keywords:** Energy Efficiency, Payback Period, Initial Investment

**JEL Codes:** P18

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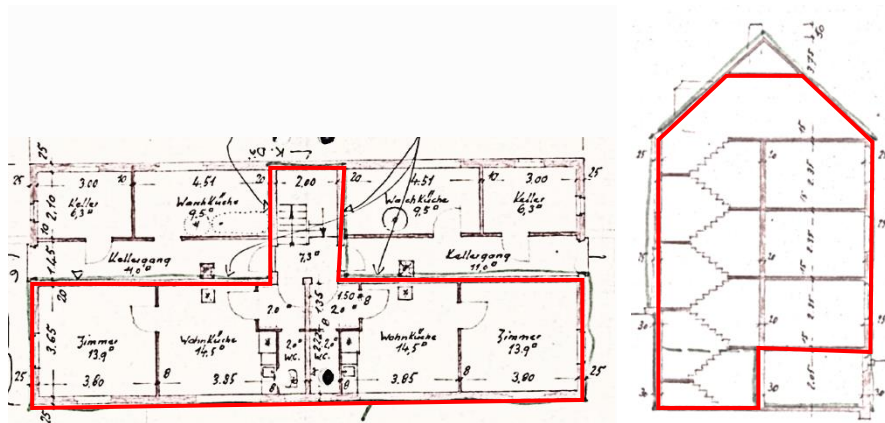
## **1. INTRODUCTION**

According to the Directive 2012/27/EU (European Commission, 2016), based on the conclusions lead by the Council on the Energy Efficiency Plan 2011, the construction sector causes 40% of the energy consumption. Building sector is responsible for one-third of global greenhouse gas emissions annually via consuming of heating and cooling energy. As buildings are responsible for around 27 % of the final end use of energy in Europe, a very high interest exists in reducing their energy consumption (Ürge-Vorsatz et al., 2015). Thermal Renders (TR) are an important solution used to improve the energy efficiency of the envelope of refurbished and new buildings and consequently lead to decrease the energy costs (Santamouris & Dascalaki, 2002). The main quality of TR is their low thermal conductivity. For this study, several insulation materials with values of thermal conductivity between 0.014 to 0.032 W/(m°C) were investigated to provide the economic Life Cycle Assessment (LCA) of insulation materials applied in the thermal rehabilitation of the external wall of a residential building using a simulation model (Barrau et al., 2014). The life-cycle stages considered were: raw material acquisition; transportation and on-site installation and living space (considering the thickness of insulation) (Garrido et al., 2017). The energy performance considers the thermal insulating characteristics, including the improvements on the energy performance of the building's envelope after its application for rehabilitation regards to achieve the energy efficiency standards for houses in Germany (KfW), and corresponding energy and cost savings.

## 2. THE CASE STUDY BUILDING

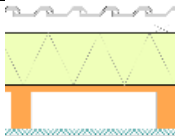
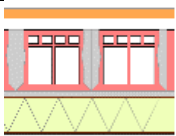
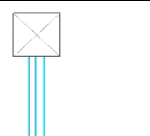
To examine annual energy demand (HWB) as performance indicator, a typical multi-unit apartment building built 1951 in the Munich, Germany was selected as a base case. Figure 1 shows the typical plan of this building. The building has one blocks in five floors (Figure 2). The basement is unheated. The building entails residential units with a total net heated space area of 304 m<sup>2</sup>.

**Figure 1. Plan and Section of Thermal Zoning of the Case Study Building Model**



The assumed data on the building's construction (see Table 1) were assumed based on the existing construction details. The existing wall construction of the case study with a total area of 304 m<sup>2</sup> (with three layers including gypsum plaster, hollow brick masonry and lime cement plaster), was assumed to be retrofitted by applying a layer of different insulation material (Table 2).

**Table 1. Construction Data of Building**

Elements	Ceiling	Floor	Window
Picture			
U-Value [W / m <sup>2</sup> K]	0.12	0.23	0.84
Construction	Wooden ceiling	Concrete	Triple glazing

**Table 2. Existing Wall Construction**

	Inside	S (cm)	R (Kg/m <sup>3</sup> )	Kg/m <sup>2</sup>	L (W/mK)	R (m <sup>2</sup> K/m)
R <sub>si</sub>						0.130
01	Gypsum plaster	1.5	1200	18	0.35	0.043
02	Hollow brick	25	1000	250	0.52	0.481
03	Cement- plaster	1.5	1800	27	0.87	0.017

<b>R<sub>se</sub></b>				0.04
	d= 28.00	G= 295.0	RT = 0.71	
Heat transfer coefficient U = 1.407 W / m²K				

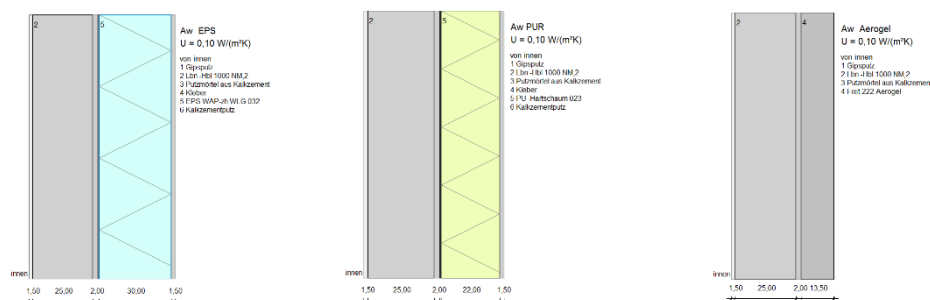
### 3. SIMULATION SCENARIOS

Multiple retrofit solutions for external wall were defined based on insulation U-value and thickness. To evaluate the thermal performance of retrofitted building model, three scenarios were designed based on alternative configurations of thickness and U-value of insulation layer (Figure 2). These configurations were labelled as Scenario S1 to Scenario S3, as listed in Table 3. It should be noted that, general simulation settings and material properties were kept constant in the aforementioned configurations.

**Table 3. Retrofit Scenarios**

Scenarios	Insulation Material	Thicknes s (m)	Thermal Conductivity (W/mK)	U-Value (W/mK)
Base case	Without insulation	-	-	1.41
S1	EPS (Expanded Polystyrene)	0.30	0.032	0.1
S2	PUR (Polyurethane)	0.22	0.023	0.1
S3	Aerogel	0.135	0.014	0.1

**Figure 2. Configuration of Three Different Constructions of Scenarios**



### 4. SIMULATION TOOL

The base simulation model is created according to current construction details, materials, and systems in the case regions. The building was modelled in Dämmwerk (2020). DÄMMWERK ("Insulation Work" in German) is the holistic software solution for EnEV and EEWärmeG certificates, for energy advice, DIN V 18599, and KfW funding applications as well as adapted for building



physics for computations of buildings and structural components with different kinds of protections like fire, moisture, noise and thermal insulation, for thermal bridges and for energy costs. The purpose of creating a base model is to estimate the annual energy consumption of conventional construction practice for the case study project. The thermal bridge influence was assumed to be  $0.05 \text{ [W/m}^2 \text{ K]}$  in all scenarios.

## 5. KfW FUNDING

The KfW, formerly KfW Bankengruppe (banking group), is a German state-owned development bank, based in Frankfurt. Its name originally comes from Kreditanstalt für Wiederaufbau ("Credit Institute for Reconstruction"). KfW Förderbank (KfW promotional Bank), the largest business unit of the group, mostly for housing and environmental protection in Germany. It is especially active in promoting energy-efficient housing for owner-occupied houses as well as for landlords, both for new houses and refurbishments. Its energy efficiency standards for houses (KfW-40 and KfW-55) have become accepted standards in Germany. Today the capital market is KfW's most important funding source, where it raises more than 90% of its funds (Figure 3).

**Figure 3. Financial Supporting of Energy Efficiency of Building by KfW**



## 6. METHODOLOGY

A methodology for the assessment of the Energy and space saving closely related to the building thermal performance has been used in this research study. The simulation's scenarios were performed aiming to achieve KfW55. For this purpose, primary energy demand (QP [ $\text{kWh/m}^2\text{a}$ ]) and transmission heat loss (HT [ $\text{W/m}^2\text{K}$ ]), are as basic parameters, which acquisition of the minimum possible amount is necessary. Note that this amount according to the conditions of each building compare with reference building can be different. Whereas the primary energy demand is more related to the HVAC system of buildings, so this factor was ignored because same conditions were considered for all cases. However, transmission heat loss as an effective factor was considered to determine the

required insulation thickness to achieve same energy level (based on total U-Value of the external wall).

Based on KfW 55, transmission heat loss value for this case should be less than 0.261 [W/m<sup>2</sup>K]. All scenarios were achieved to 0.259, with a thickness of 30cm (S1), 22cm (S2), and 13.5 cm (S3) for EPS, PUR, and Aerogel respectively. For investment decisions, investment outlay including the cost of financing must be compared to the annual expected cash flows or contribution margins, respectively, during the project's lifetime (Zwifel et al.,2017) payback period is the time taken for the total initial investment of a product to be recovered by the total accumulated savings. A simple calculation of payback period was assessed using below Eq(Wong et al., 2007). In this order to evaluate the cost of space-saving to determine the payback period of investment, the monthly rent was assumed that 17,54 Euro per m<sup>2</sup> in location of the case study-Munich- Kreuzviertel (mietpreisspiegel.de,2020).

$$\text{Payback period} = \frac{\text{Initial investment \& Maintenance costs}}{\text{Expected return per year}} \quad (1)$$

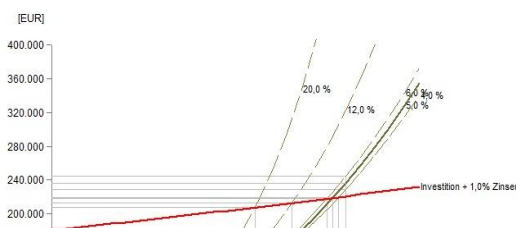
## 7. RESULT AND DISCUSSION

Design details and energy-saving features for this particular case study are available from the Dämmwerk program. The annually energy cost saving resulting from the retrofit of the existing envelop was calculated 1,847 EUR/m<sup>2</sup>, whereas, the initial investment (EUR 48,729) was calculated by multiplying 92 EUR/m<sup>2</sup> by the 30cm EPS insulation area of 395 m<sup>2</sup> total area of external walls. As shown in Table 3, 16 years payback periods were calculated at 1% discount rates, if the initial investment was paid off in the first year.

Note that the payback period can be shorter. This study focused on the effect of saving space (thickness) on the payback period and the other effective parameters which were same in all scenarios have been ignored. Figure 4 illustrated the payback period of retrofit by applying 30 cm EPS insulation with different energy price increases, whereas the cost savings or capital costs are plotted vertically in [EUR].

**Table 4. Summary of Costs Payback Period of EPS Insulation and Amortization Time with Different Energy Price Increases-EPS**

EPS	payment of interest	Savings in costs € 1,847 €/a 5,0%	investment 48,729 € 1,0%	Profit
	After 2 Years	3,936	49,705	-45,769
	After 4 Years	8,679	50,704	-42,025



After 6 Years	14,353	51,723	-37,37
After 8 Years	21,099	52,763	-31,664
After 10 Years	29,077	53,823	-24,747
After 12 Years	38,469	54,905	-16,437
After 15 Years	55,665	56,569	-904
After 18 Years	77,327	58,283	19,044
After 24 Years	138,168	61,869	76,299
After 30 Years	231,448	65,675	165,773
<b>Amortization after 16 years</b>			

A reduction 8 cm thickness of PUR compared to EPS led to space-saving of 10.28 m<sup>2</sup>, it caused corresponding annually 2,164 EUR saving which added to the annually calculated energy cost saving resulting from the retrofit of the existing envelop (3,903 EUR/m<sup>2</sup>), whereas, the initial investment (EUR 73,535) was calculated by multiplying 144 EUR/m<sup>2</sup> by the 22cm PUR insulation area of 395 m<sup>2</sup> total area of external walls. As shown in Table 4, 13 years payback periods were calculated at 1% discount rates, if the initial investment was paid off in the first year. Without considering the space cost-saving, the payback period increases to 21 years.

**Table 5. Summary of Costs Payback Period of EPS Insulation and Amortization Time with Different Energy Price Increases-PUR**

<b>PUR</b>	payment of interest	Savings in costs € 3,903 €/a 5,0%	investment 69,242 € 1,0%	Profit	
	After 2 Years	3,936	49,705	-45,769	
	After 2 Years	8,088	70,634	-62,545	
	After 4 Years	17,38	72,053	-54,673	
	After 6 Years	28,037	73,502	-45,464	
	After 8 Years	40,242	74,979	-34,737	
	After 10 Years	54,199	76,486	-22,287	
	After 12 Years	70,14	78,023	-7,884	
	After 15 Years	98,348	80,388	17,96	
	After 18 Years	132,63	82,823	49,807	
	After 24 Years	224,507	87,919	136,589	
<b>Amortization after 13 years</b>					

A reduction 16.5 cm thickness of Aerogel compared to EPS led to space-saving of 21.35 m<sup>2</sup>, it caused corresponding annually 4,493 EUR saving which added to the annually calculated energy cost saving resulting from the retrofit of the existing envelop (6,233 EUR/m<sup>2</sup>), whereas, the initial

investment (EUR 181,094) was calculated by multiplying 459 EUR/m<sup>2</sup> by the 13.5 cm Aerogel insulation area of 395 m<sup>2</sup> total area of external walls. As shown in Table 5, 20 years payback periods were calculated at 1% discount rates, if the initial investment was paid off in the first year. Without considering the space cost-saving, the payback period increases to 32 years.

**Table 6. Summary of Costs Payback Period of EPS Insulation and Amortization Time with Different Energy Price Increases-Aerogel**

AEROGEL	payment of interest	Savings in costs € 6,233 €/a 5,0%	investment 181,094 € 1,0%	Profit
	After 2 Years	3,936	49,705	-45,769
	After 4 Years	12,864	184,734	-171,87
	After 6 Years	27,421	188,447	-161,026
	After 8 Years	43,883	192,235	-148,351
	After 10 Years	62,488	196,099	-133,61
	After 12 Years	83,502	200,04	-116,538
	After 15 Years	107,223	204,061	-96,838
	After 18 Years	148,622	210,244	-61,623
	After 24 Years	198,175	216,615	-18,44
	After 30 Years	328,198	229,941	98,257
	Amortization after 20 years			

## 8. CONCLUSION

It can be concluded that the location of the project, has a significantly impact on the Payback period. Even though the initial capital of PUR was about 1.5 times of EPS, however, its payback period is 3 years less than EPS and it provided 3% space-saving. whereas with reduction of rent price to 10 Euro per m<sup>2</sup>, they will have the same payback period. This comparison for Aerogel shows that 6% space-saving, and just 4 years more payback period, which increasing the rent price to 26 euro, they will have same payback period.

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**XI JINPING AND CHINA'S QUEST FOR HEGEMONIC POWER**

**Mohammed Kamal Alhassan<sup>1</sup>**

<sup>1</sup>European University of Lefke, Cyprus, amkamal20007@gmail.com

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**ABSTRACT**

*This study discusses the role of the current President of China, Xi Jinping in the de facto quest for Chinese hegemonic power. Xi Jinping, since his assumption of leadership of the Chinese government on 14th March, 2013, has accomplished many things. The study does not neglect the role of the United States of America as a hegemonic power in international relations. It tries to analyse China's policies and programs in the international system through quantitative and qualitative methods. It examines China's role in the South China sea, its military expenditure and influence, the "one China, two systems" policy towards Taiwan, the creation of the Asian Infrastructure Investment Bank (AIIB) and the favourable balance of trade with the US. Furthermore, the role of Intergovernmental Organizations (IGO's) like the United Nations (UN) and the BRICS in international relations can not be over-emphasized. As a result of this, the study will also examine the role of China in consensus building and international cooperation. This primarily focuses on China's contributions to the UN and BRICS. Finally, the study uses qualitative and quantitative data to analyse China's foreign policies. In the end, data analysis will prove that China is on the right track to becoming the next hegemon.*

**Key Words:** Foreign Policy, National Interests, Hegemony, International Relation

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## **1. INTRODUCTION**

China has always presented the world with intrigue even long before the reign of its founder Sun Yat-Sen. The country has developed from mainly an agrarian economy to become the production hub of the world. International Relations experts and other analysts have described China's economic power and perceived military strength as a catalyst for becoming a hegemonic power. China's economic performance for the past decade has been phenomenal as key indicators are all pointing in the right direction. According to Xinhua Net (2019), the Chinese economy grew 6.1% with a gross domestic product (GDP). China set several records as the best growing economy in the world.

The Chinese President, Xi Jinping was elected on 14th March 2013 replacing President Hu Jintao. Since his election, Xi Jinping has really revitalized the "Chinese dream." The aim of this study is to analyse the contributions of Xi Jinping to the de facto quest for a Chinese hegemonic power. This would be done by subjecting his policies and programs through the lenses of the conceptual frameworks for hegemony. In the end we would be in the best position to conclude if these policies and programs connote a quest for hegemonic power. We however need to note that in analysing the Chinese quest for hegemonic power, the role of Xi Jinping, the current Chinese President can not be ignored. According to J.P Panda., (2016., p.3) leaders have a powerful effect on a state's objectives, tactics, diplomatic and military capabilities.

According to the proponents of the first image approach, the role of a leader in the foreign policy of a country is very important. They often cite leaders who were strong like Margaret Thatcher, Mikhail Gorbachev, Saddam Hussein, Ronald Reagan, and Hugo Chavez to buttress their point. According to the first image theory, strong leaders through their abilities to take sound decisions and policies are able to make a great difference in the economic development of their countries.

## **2. WHO IS XI JINPING?**

Xi Jinping was born on 15<sup>th</sup> June, 1953 in Fuping province even though some accounts put Beijing as his birth place. His parents were Xi Zhongxun, who was a revolutionary leader and Vice

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Premier and Qi Xin. He is currently married to singer Peng Liyuan. He holds a bachelor's degree and LLD in chemical engineering from Tsinghua University,

He finally joined the Communist Party of China (CPC) in 1974 after three earlier attempts failed. He rose through the ranks of the CPC and in 2000 became the Governor of Fujian Province. He became the General Secretary of the CPC on 15<sup>th</sup> November, 2012 replacing President Hu Jintao. On 14<sup>th</sup> March, 2013 Xi Jinping was named as President of the Peoples' Republic of China by Parliament. On 11<sup>th</sup> March 2018 Parliament endorsed the change to make Xi Jinping stay in power indefinitely.

### **3. DEFENCE AND MILITARY STRENGTH**

Military strength in terms of modernization and expenditure is an important indicator in acquiring hegemonic power. According to the neo-realist theory for hegemony, for a country to attain hegemonic power military force is necessary. According to Waltz., (1979., cited in Dirzauskaite and Christinel Ilinca., 2017), with the absence of a leader on the world stage, countries will intervene and use military power to advance their own interests. A critical analysis of the expenditure and degree of modernisation of the Chinese military under Xi Jinping will appraise us to that effect. The extent to which the Chinese are modernizing their military is a sign of their preparedness to offer a challenge to the US hegemonic power. Dirzauskaite and Christinel Ilinca (2017) agree that for a hegemonic power to be achieved there must be military power to coerce subordinates into submission.

#### **3.1. Military Expenditure**

China has increased its defence budget significantly under Xi Jinping. This has been done to make the Chinese military as efficient as possible and even rival that of the US. This is to prepare the country any time there is war. The proponents of defensive neo-realist approach for hegemony argue that countries should acquire military capabilities but not to use it to attack other nations. The persistent increase in the Chinese defence budget is therefore meant to modernize the Chinese military and be a deterrent to the US.

Defensive neo-realists like K.N Waltz believe that countries should not use their military unless when they are attacked by others. This is because more engagements in war makes a hegemony power vulnerable. This was clear during President of Obama's tenure because he had to reverse the negative effects of President John W. bush's military adventure in Iraq and Afghanistan. According to Einsiedel., Malone and Ugarte (2015: 2) this action helped in reconciliation in the Security (SC) and paved the way for tightening sanctions again Iran and North Korea.



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**Table 1. Chinese Military Expenditure from 2009 – 2019 (Billion Dollars)**

YEAR	MILITARY EXPENDITURE
2019	170
2018	152
2017	143
2016	140
2015	140
2014	130
2013	100
2012	90
2011	85
2010	72
2009	70

\*PRC announced defence budget 2019

**IISS**

Source: IISS Military Balance+

From figure 1 above, one can see an increasing trend in the defence expenditures of China from a meagre 70 billion dollars in 2009 dollars to a whopping 170 dollars in 2019. This increasing trend clearly demonstrates Xi Jinping's desire to modernize the army to achieve the "Chinese dream."

### **3.2. Construction of Military Bases in the South China Sea**

One other determinant of Xi Jinping's quest for a Chinese hegemonic power is the fast tracking of the construction of military bases deep into the sea because China, Vietnam, Indonesia, Brunei, and the Philippines all lay claim to the territory. project (2016) estimates that about 3.37 trillion-dollar worth of trade passes through the South China sea.

Since, 2013, the Chinese government under Xi Jinping has intensified the building of military bases in the territory defying US opposition and threats. According to J.P Panda (2016) by setting up these military bases China has maintained its presence and power in the region. Therefore, US policy of "pivot to Asia" is seen as an attempt to rebalance power in the region by Beijing.

**Figure 1. The South China Sea**



### **3.3. The “One China, Two Systems” Policy Towards Taiwan**

The communist party of China took-over the mainland after the revolution in 1949. Since then, several Chinese Presidents have tried to reunify Taiwan with the mainland. According Jiang (1995a) the people of China are one people anywhere and are bounded by flesh and blood (cited in Neil C. (2013., p. 7). Even Mao Zedong made it clear that his government was committed to the “one China” policy. As at 2019, only 14 members out of the 193 of the UN including the Holy See have recognized the sovereignty of Taiwan as an independent country. The US after recognizing Taiwan for 30 years backed down in 1979 but continues to provide military support. China has always interpreted that as U.S opposition to the “one China, two systems” policy.

However, the election of Xi Jinping has boosted the long-cherished dream of the mainland’s unification with Taiwan. In his famous “six anys” speech, Xi Jinping reiterated that china will not compromise on its “one China policy”. According to S. Chi (2017., p.7), Xi Jinping said that any one, any organisation, any political party or in any form at any time can not change any territorial boundaries of a united China. Consequently, China has intensified its military exercises around the Taiwan strait (L. Chen., 2019). Political Analysts believe China is closer to reunifying with Taiwan

under Xi Jinping than under any other former president. This is partly due to the Chinese military build-up in the north China sea and China's economic power and dominance under Xi Jinping.

#### **4. ECONOMIC POWER AND INFLUENCE**

One other factor that the theories for hegemonic power consider in assessing a country's quest for hegemonic power is economic power and influence. According to the neo-liberal approach for hegemonic power, even though military power is needed for hegemonic power the most important consideration is alliances, raw materials, sources of capital and the ability to produce at a comparative advantage.

According to Robert O. Keohane and Joseph S. Nye, even weaker countries can find protection under an alliance. Keohane and Nye (1989., cited in Dirzauskaite and Christinel Ilinca., 2017: 29) argue that even countries that are very powerful can not attack weaker nations unprovoked. They go on to say that what is important in the international system is capital resources, raw materials, viable markets and the possession of a comparative advantage (Keohane R., 1984., cited in Dirzauskaite and Christinel Ilinca., 2017: 29)

It is evident that any country that seeks for hegemonic power must have access to raw materials and natural resources, capital resources, available markets and develop comparative advantage in the production of goods. This study will therefore analyse the prevailing economic and financial policies of China under Xi Jinping. Specific policies and programs will be put under the microscope to ascertain a Chinese quest for hegemonic power.

##### **4.1. The Creation of The Asian Infrastructure Investment Bank (AIIB)**

In its quest to create a bank that can rival the Bretton woods institutions of IMF and the World Bank, China opened the AIIB in 2016. The bank currently has 102 members and was commissioned by Xi Jinping to help finance his "one belt one road" vision. The bank is also tasked to provide financial support to Africa and other emerging economies.

The one belt one road project encompasses a shift for developing countries in resisting stringent conditionalities from the Bretton woods institutions. According to Panda (2016., p.170) in doing so Xi Jinping is showing a way of boosting investments to create employment for countries along the silk road. These countries include India, Indonesia, Vietnam, Cambodia, and Pakistan. In the words of Babones (2018) the AIIB was expected to lend between US\$ 10 - 15 billion for various projects.

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**Table 2. AIIB Lending by Country (2016 – 2017)**

Country	Amount Received (Million Dollars)	No, of Projects Approved
Asia Wide	180	1
Azerbaijan	200	1
Bangladesh	280	2
China	200	1
Egypt	200	1
Georgia	200	1
India	1.2 billion	5
Indonesia	620	2
Myanmar	200	1
Pakistan	400	2
Philippines	180	1
Tajikistan	100	1

**Source:** Adapted from Forbes.com

From the above table, India is the largest recipient of AIIB loans with 1.2 billion dollars, while Tajikistan is the least recipient with 100 million dollars. We can safely conclude that China has become a hegemonic power by lending money through the AIIB.

#### **4.2. Achieving a Better Balance of Trade Against US**

China has been able to have a better balance of trade in its commerce with US. This has really resulted in trade disagreements and the imposition of exorbitant import duties on both sides. According to BBC news of 16th February 2020, US imposed a tariff amounting to US\$ 360 billion, necessitating the imposing of US\$ 110 tariffs from China in retaliation. The amount of tariffs imposed was 15% on the Chinese goods and between 5% - 25% on American goods. There is no doubt that China is winning the economic battle in its trade wars with the US. It can safely be said that China is on the move to become a hegemonic power due to its economic dominance even relative to US in the world.

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**Table 3. China and US Trade Balance (2014 - 2019)**

Year	US (million \$)	China (million \$)
2014	123.65	468.47
2015	115.87	483.20
2016	115.54	462.54
2017	129.89	505.47
2018	120.19	539.68
2019	52.00 (1st quarter)	299.04 (1st quarter)

**Source:** Adapted from statista.com

From the above table, we can see that China is dominating the economic battle with the US. Also, according to a report by Investopedia (2020), China owns US\$ 1.1 trillion in US long term bonds. It means US now depends on China for its financial resources. We can therefore safely say that China is the most dominant economic power in the world now and is poised to become the next hegemon.

#### **4.3. Comparative Advantage over the US in the Manufacturing of Several Goods**

One other yardstick for determining hegemony power is a country's comparative advantage in the manufacturing of goods over other countries, According to Batra and Khan (2015), out of 97 sectors and 4923 commodities, China has comparative advantage in 47 sectors and in the manufacturing of 1828 commodities that are exported in the world, Some of the commodities that China is competitive in its production includes items of apparel, electronic and electrical appliances, toys and leather goods. As a result of this, the US now imports many commodities from China. The table below compares the comparative advantages between China and the US in the cost of labour. The average hourly compensation for labour is \$23.17 in the US but lower in China at \$0.57. Also, if the adjusted cost of labour is 100% in the US, the same figure is 18% in China.

**Table 4. The Economics of the ‘China Price’**

	Average Hourly Compensation	Productivity Index (US = 100)	Productivity- Adjusted Labor Cost	Adjusted Cost as Percent of U.S.
U.S.	\$23.17	100	\$23.17	100%
China	\$0.57	13.7	\$4.16	18%

The Economics of the “China Price”

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A report by Robert E. Scott published by The Economic Policy Institute on 30<sup>th</sup> September 2013 suggests that 97.8% of US imports from China were manufactured goods. The report also revealed that the US lost 2.7 million jobs between 2001 to 2011 out of which 2.1 million or 76,9% were from the manufacturing sector. Goods that are produced in China have low cost of production and hence low prices. On the other hand, those produced in the US have high cost of production and hence high prices. More companies in the US are relocating to China culminating into job losses in the US. China under Xi Jinping has become a manufacturing giant in the world and therefore poised to be the next hegemonic power.

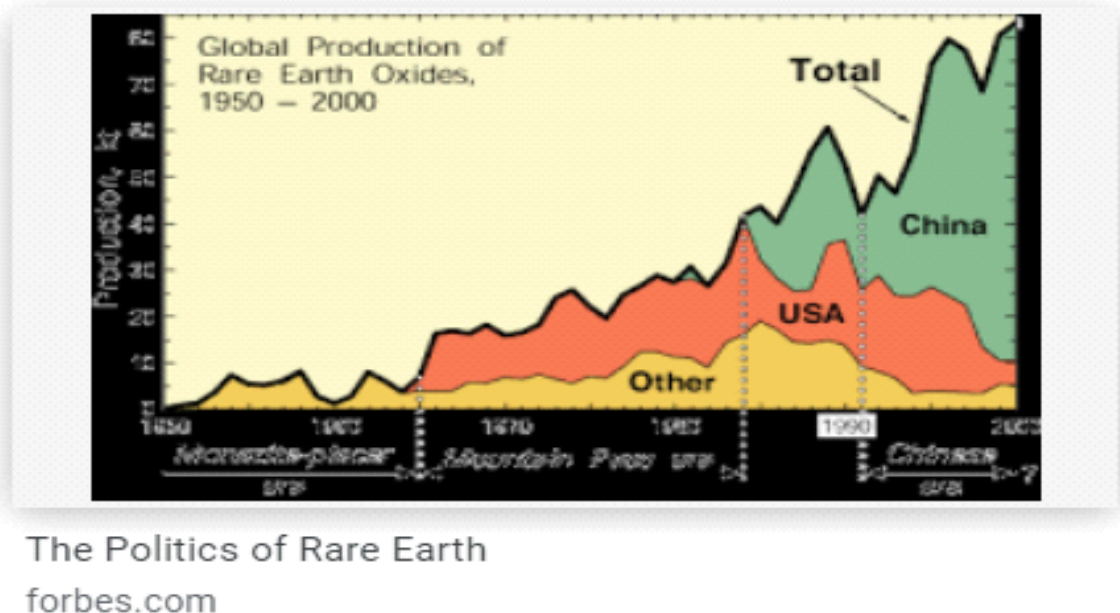
#### **4.4. Control of Rare Earth Elements -REE (Natural Resources)**

Real earth elements or REE's are elements which appear on the periodic table and have atomic numbers of between 57 and 71. These are seventeen (17) elements in total some of which are Yttrium, Lanthanum, Cerium, Praseodymium and Scandium. These elements have many uses including the manufacturing of oxides, magnets, glass, electrical and electronic parts. China has played an active part in the mining of REE.

According to Du and Graedel (2011), these elements are very essential in our contemporary world because they serve as raw materials for the manufacturing of many commodities. For instance, the aviation industry can not function without REE's. According to Mancheri (2012), China has increased its production from 1,000 tonnes in 1978 to 11,860 tonnes in 1986. In 2018, China is reported to have produced 120,000 tonnes of these elements. A report by the United States Geological Society (USGS- 2014), estimates that China alone controls 97% of the world production of REE's.

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**Figure 2. The Politics of Rare Earth**



The table above shows the global production of rare earth elements from 1950-2000. It shows that China has dominated the US in the production of REE's.

The US is arguably the leader in the world's aviation industry and heavily relies on China for its REE supplies. The US will therefore face a lot of problems if China decides to cut the supply of REE's. In order to maintain these supplies, the US must co-operate with China, China therefore uses its production of REE's as a bargaining chip against the US.

## **5. TOWARDS CONSENSUS BUILDING AND INTERNATIONAL COOPERATION**

International cooperation and consensus building are the current norm in International relations. According to the Gramscian theory for hegemony, the use of coercion to achieve foreign policy objectives is not effective but it is only when there is consensus building that a hegemon can emerge (Konrad., 2012., cited in Dirzauskaite and Cristinel Ilinca., 2017: 33).

In international relations, consensus building is achieved through institutions. The Gramscian theorists contend that in addition a hegemon must use ideology and values to be the dominant class and thus be accepted by the subordinate classes (Cox., R.W., 1996., cited in Dirzauskaite and Cristinel Ilinca., 2017: 33). This part of the study will therefore analyse the policies of Xi Jinping and China on the world stage and measure their contributions to consensus building and cooperation. According to Panda., (2016: 13), Xi Jinping has demonstrated leadership that has not been seen in any Chinese

leader for a very long time. China is now adopting a more proactive role in international relations. China has now demonstrating through its policies and programs on the international arena that it has come of age.

### 5.1. Contributions to the United Nations (UN)

Firstly, China contributes a lot to the funding of the UN. According to China daily (2019), China contributed 15.22% of the UN budget amounting to about US\$ 7 billion. This amount is very substantial in real terms. China is a regular contributor of troops to UN peace keeping duties. In 2015, more than 3,000 Chinese troops were involved in UN peace keeping operations.

**Figure 3. China's Contributions to UN Peace Keeping Operations (2000 – 2018)**

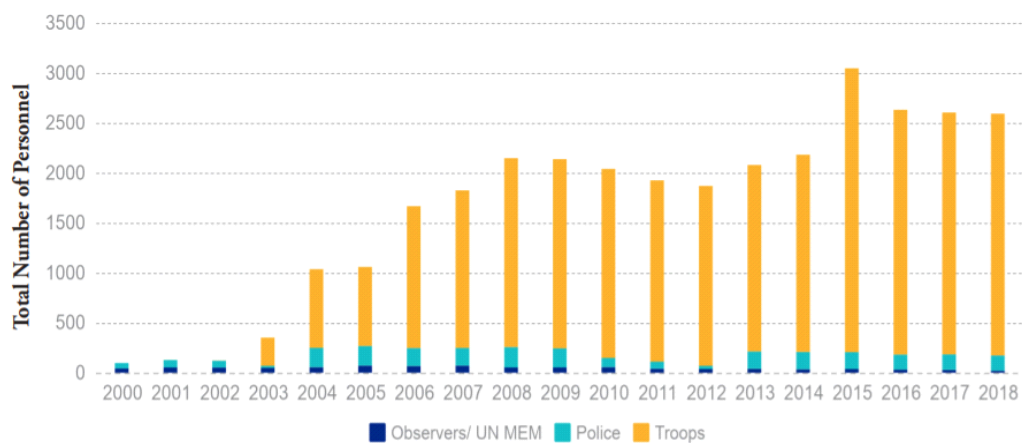


Figure 2: China's Contribution to Peacekeeping Personnel (2000-2018)

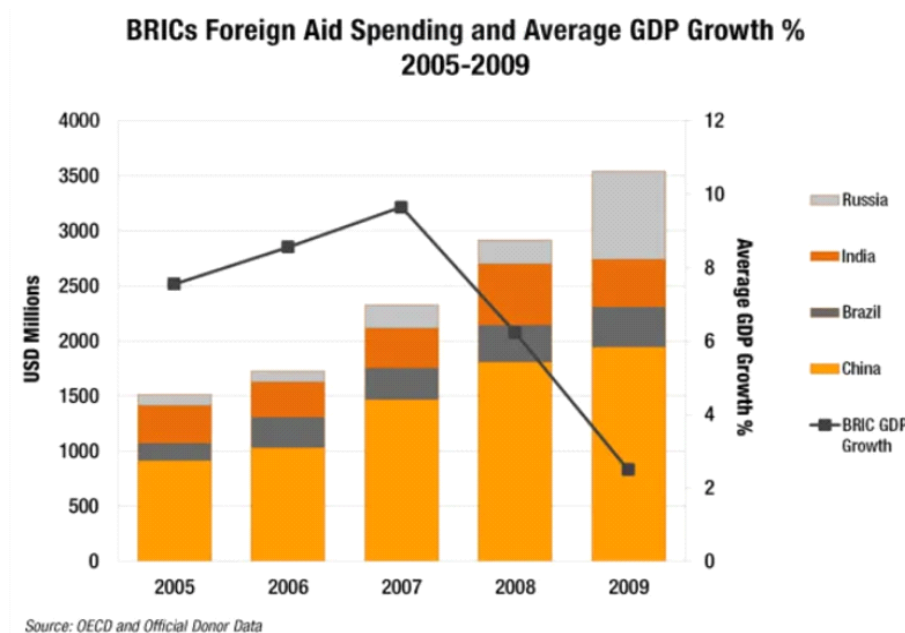
Source: ispd.eu

### 5.2. Contribution towards to BRICS

BRICS as an association for international cooperation was established in 2006. The members include B – Brazil, R- Russia, I – India and C – China but S - South Africa became a member in 2011. According to Itamaraty (2016) the organisation has as objective to cooperation on health, science, technology and digital economy. Since its inception, China has played a very important role in coordinating and financing of the organisation.



**Graph 1. BRIC's Foreign Aid Spending and Average GDP Growth % 2005-2009**



The graph above shows the growing influence of China on other BRIC members. For instance, in 2009, Chinese foreign aid to the financing of BRICS projects and programs was about US\$ 3 billion. This clearly shows the Chinese dominance in relation to the other members of the bloc.

## 6. CONCLUSION

The data provided in this study clearly shows that president Xi Jinping has contributed a lot to the Chinese dominance in international affairs. Analysing these contributions vis-a-vis the theoretical frameworks for hegemonic power, one can confidently say that China is on the right footing in its quest to become a hegemon. Its policies and programs such as military spending, construction of military bases in the south china sea, approach towards the “one China, two systems” with Taiwan, economic power in production, the establishment of AIIB, edge in trade balance and comparative advantage over the US and growing influence in international cooperation is there for all to see. Financial and Economic Analysts estimate that China will become the world’s leading economy by the year 2024 edging out the US. The outbreak of the Corona virus 2019 (COVID-19), has negatively affected the world but China has now recovered, Financial and Economic Analysts believe the pandemic has the effect of fast tracking that process. There is therefore no doubt that China is gradually moving towards the path of becoming the next hegemonic power.

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**USA, GEOPOLITICS, WAR IN AFGHANISTAN**

**Wahid Ahmad Bahir Noorzai<sup>1</sup>**

<sup>1</sup>European University of Lefke, Cyprus, wahidnoorzy222@gmail.com, icoaef@gmail.com,

ORCID: 0000-0002-9532-1143

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**ABSTRACT**

*The 11<sup>th</sup> Sept 2001 was an excuse for the Americans to reach up to their hegemonic goals. Unquestionably, the US, similar to other powers, is aware of the geopolitical significance of some regions. For this reason, the 11<sup>th</sup> September 2001 aspect formed to revive the idea of the geopolitical theories of scientists such as Mackinder, Haushofer, Spykman, and others. The US, by the application of these truths that demonstrate the strength and greatness of countries are in the pledge of the importance of regions that are underneath, could manifest new portraiture of its tricks for its presence in the global. Undoubtedly, for the United States, areas such as the Middle East and Central Asia are not only vital in their past and may have increased in importance. That's how this research examines the theme of Afghanistan's geopolitical status as the most significant reason for the US invasion of this country after 11<sup>th</sup> September. The US, by Emphasis the views of geopolitical theorists, realized that regions such as Central Asia and the Middle East remained so outstanding because their particular features and capabilities are remarkably significant. Also the Islamism, population, energy resources, sensitive situation, etc., the Middle East, Central Asia due to energy, geopolitical position, and most importantly due to its nearness to the new Russia and the impact of this potential in this zone and also the policies of the recent Russia. Going back to the past, they all joined hands to create r 11<sup>th</sup> Sept to save America's future. Finally, this study discusses the US and the Taliban's deal, which signed after almost two years of negotiation on February 29, 2020 in Doha, Qatar. Ultimately, this long war, a big failure, drained the US efforts. The United States repeat the Soviet Union's experience for leaving Afghanistan without any plan for power vacuum.*

**Key Words:** US, Geopolitics, Mackinder, Spykman,

**JEL Codes:** F59.

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## **1. INTRODUCTION**

Due to its privileged geopolitical position, Afghanistan is very significant in terms of neighborhood and proximity to other countries and competitors of past times and today. In all of the geopolitical theories, the political significance of some areas, includes Asia, Eurasia, and the Middle East, can be seen. For that intent, it has remarkably held which several of that all opinions have remained at the forefront of great wars throughout history. Therefore, it is not exaggerated that these spheres are significant to the US as the dominant power of the century. The United States was able to choose an area like Afghanistan, in addition to the current situation in this country, also controls its geopolitical circumstances, her crucial borders, and realized that by dominating Afghanistan. It could exert its influence and control over Iran, Russia, China and will be able to spread its activities in the region.

The United States came to Afghanistan for the reason of struggling against terrorism but certainly following the end of the cold war. It was for the sake of expanding hegemony power, which is considered a response to the vacuum of security strategy. The USA used the 11th September 2001 incident to proceed via this adventure to become world hegemony (Krahmann, 2005). The 11th September events marked the beginning of a series of incidences that took place one after the other. That was a historic milestone for the USA that provided acceleration for advancing and creating a new system and as well as shifting the international system.

According to John Mearsheimer, "great powers seek to maximize power a goal to gain hegemonic status" (Mearsheimer, 2001). The offensive realism can explain to some extent the American invasion in Afghanistan. However, the issue cannot finish only to occupy and attack a country but creating a structure of power after the downfall of the rival state also is more important. After the Afghanistan occupation, the United States could not succeed to constitute a strong power structure and making a space for peace. Consequently, the USA has been involved in a deep swamp. Currently, it is trying to leave this created swamp after approximately two decades of combating with the Taliban. However, America failed to form a successful structure of power. Hence, the departure of Afghanistan by the United States probably leads to a more extensive power vacuum (Shahid, 2019). So this matter could bring some disorders in the security of the USA. There are some questions for this research. A) What role has Afghanistan's geopolitical position played in the US military invasion of Afghanistan? B) What is the US economic and political interests in Afghanistan? C) Does the US have an exit plan after leaving?

## **2. GEOPOLITICAL THEORIES**

The geopolitical concept means that the geographical position of a region affects the geography of other countries. As a source of knowledge, geography has emerged from the heart of geopolitical science, and it has a long history as any other advanced concepts. It enables them to penetrate some spheres. Rise and maintain their position (Sempa, 2002)

The most significant geopolitical theories are specified below:

### **2.1. Sir Helford John Mackinder (Heartland theory)**

The heartland theory should be considered the foundation of all geopolitics discussion issues of the 20th century. Also, that term is regarded as the most popular model in the political geography of the world. According to this theory, anyone with Eurasian human and physical resources between Germany and Siberia and has central control of Siberia can rule the earth (Mackinder, 1919). This theory was promulgated by the Mackinder within an article in 1904 and later in his book in 1919.

In a message, Mackinder considered Britain superior power over earth, more vulnerable than ever before, and advocated for land-based power production. According to this theory, Eurasia's great land was an area inaccessible to maritime power that represented the character of a fortification that has constants been the center of pressure on surroundings around the throughout history. Mackinder described the three spheres of Asia, Europe, and Africa, as a global island, also declared the principal axis Hartland. He answers, "Whoever rules Eastern Europe will rule the heart of the earth and the region. Whoever rules the heart of the earth will be the ruler of the world island. Whoever rules the world island (Spykman N. J., 1942) will be the ruler of the world." (Mackinder, 1919)

### **2.2. Nicholas Spykman (Rimland theory)**

The Rimland perspective consists of Europe, Middle East, Africa, South Asia, and the East. The key to the security of the United States refers to this theory, which was submitted by Nicholas Spykman. He believes that the rule in any of these areas threatens US security, and it is because of such a situation that the siege of the new world becomes achievable (Spykman N. J., 1944). He says that "whoever controls the Rimland governs Eurasia, and whoever controls Eurasia has the destiny of the world" (Spykman N. J., 1942).

### **2.3. Karl Haushofer (Living space theory)**

Haushofer and his followers at the Munich Geographical Institute examined the principles of Germany's downfall in the first World War, and he searched plans for the German army to succeed. According to documents left by Haushofer, he had a particular strategy for German geopolitics. If his policy worked, the Globe would be distinctive now because his policies rooted upon the assumption that the main enemy of the future maritime power was Britain. For that reason, all states that possess a

chain power in zone Eurasia should unite. Haushofer was opposed to the German invasion of Russia because he believed that German forces in Russia would be defeat and also broken. (Günter, 2007)

**2.4. Admiral Alfred Thayer Mahan (sea power theory)**

The Influence of Sea Power upon History denoted Mahan's magnum opus and the cornerstone of practically full of his next work. Contained in its opening chapters was the sea power of Mahan thesis, his firm faith that sea power was the core to national security and global dominance. In The Influence of Sea Power Upon History, Mahan reconsidered the position of sea power on the rise and also the growth of the British Empire. He revealed the sea similar a "vast highway" and "wide common" with "well-worn trade routes" over which men move in whole directions. He identified numerous narrow portions or strategic "chokepoints," the handle of which contributed to Great Britain's rule of the seas. He famously recorded six primary factors of sea power: geographical position, physical conformation, territory's extent, population's size, the people character, and the government character (Mahan, 1889). Underpinned basically upon those circumstances, Mahan perceived the US as the geopolitical successor to the British Empire. Mahan's primary statutes involved the geography and environmental status of a nation (Sumida, 1999).

**2.5. Saul Bernard Cohen (Fragile Belt Theory)**

Cohen proposed the Fragile Belt Theory in which the Middle East is located. It is crushed. Cohen defines the theory of the fragile belt as "a large area with a strategic position occupied by the struggling states ... that is perceived among the clashing benefits of the tremendous capabilities" (Cohen, 2003).

**2.6. Jean-Jacques Schreiber (Schreiber's theory)**

Jean-Jacques Schreiber believed that any country that dominates the Arabian Peninsula rules the whole continent of Europe. Naturally, any state that leads Europe will rule the world (Geoffrey Sloan, Colin S. Gray: (Editors), 1919). In all of these theories, the political significance of some area includes Asia, Eurasia, and the Middle East, can be seen. For that reason, it has remarkably held which several of that all views have leftover at the forefront of great wars everywhere history. Therefore, it is not exaggerating that these areas are vital to the USA as the predominant power of the century.

**3. AFGHANISTAN'S POSITION IN GEOPOLITICAL THEORIES**

Afghanistan, as a landlocked country, is a strategic geographic complement to its neighbors. In basic, a country with a strategic position and with geopolitical realm is unavoidably part of a military strategy. It is important to note that the importance of Afghanistan, which peaked in the 18th and 19th centuries with intense competition between Russia and Britain, can be traced back to Mahan's theory of maritime power, according to Mohan, national greatness was inseparably linked with the sea, with its commercial practice in peace and its control in war (Mahan, 1889). At that time, greater access to

open waters and bottlenecks played a role. The Russians want to be available the hot springs water where were an opportunity for the Persian Gulf and the Indian Ocean to reach the waters, and Britain was trying to keep the Russians from gaining control of the region's waters by preventing the Russians from getting the warm waters, so Afghanistan became a competitive arena.

Today, Afghanistan is of special importance in Mahan theory because the powers of the Indian Ocean and the Persian Gulf can monitor and observe the most of the world's energy issues, so in Mahan's theory, Afghanistan's importance has not diminished, Indeed, it has become more important and vital in the realm of geopolitics.

By the advent of the US as a new power in the post-Cold War epoch, Afghanistan's importance can be further explored from the perspective of Hartland's theory of Mackinder according to him, a region of the globe located in Eurasia due to its sheer extent, a wealth of sources, and a huge population (Mackinder, 1919). And the Rimland theory of Spykman, according to his Rimland theory, the marginal areas or littorals of Eurasia are fundamental to regulating the World Island, not the Heartland (Spykman N. J., 1944).

The United States strove to put the Soviet Union in a too difficult and burden position by occupying the Rimland's region, and Afghanistan's role was redoubled. Afghanistan's role in the theories of Hartland and Rimland after World War II, and especially throughout the Cold War, impersonated a significant function in the politics of powerful countries. With the destruction of the Soviet Union and the termination of the Cold War, the military discussion and the geopolitical circumstances altered the way to the economic issues and the geo-economic situation. The criterion of power in the 21st century is the international economic capability, the Middle East, especially the Persian Gulf and the Caspian Sea, will be important geostrategic and geo-economics regions. Today, with the importance of Heartland Energy's vitality resources, Afghanistan can show its importance in global politics (priya, 2014).

#### **4. GEOPOLITICAL, AND AFGHANISTAN IS A SWAMP FOR HEGEMONIES**

Geopolitics reasons and the Soviet Union access to hot waters, access to Oil-rich resources, the possibility of the collapse of the Afghanistan Marxist regime. The domination of Islamists, the expansion and infiltration, and the balance of power issues between Russia and America (especially after China approached Europe) perhaps can help us to explore the reason for Afghanistan's occupation. On the other hand, after the end of the Cold War and the creation of a security vacuum in the region, the United States tried to occupy Afghanistan with a set of geopolitical reasons for expanding its influence, create a new security system, and other issues (Riedel, 2009).



The United States and the Soviet Union, after the Afghanistan occupation, faced drastic obstacles to establish a stable security system and to implement their own opinion and interest in this country. After a while, the Soviet Union encountered a barrier called the mujahidin, though, we cannot ignore the game of the bipolar system and the behind-the-scenes hand of the USA against the Soviet Union in Afghanistan. However, the Soviet Union sank in a broad swamp and faced a variety of military, economic, and security expenses. So, the continuation of the presence of this country in Afghanistan was more like sinking in the swamp (Tepperman, 2010).

The Soviet Union left Afghanistan at the time of Gorbachev. After a while, the power vacuum shaped and lead to many civil wars in the country. Thus, the United States to gain its goals and to show its hegemonic power to the world, use it from the power vacuum, and entered Afghanistan. Therefore, comparing the presence of these two great powers in Afghanistan show that both faced with a collection of expenses and failings. In addition to the two countries' militaries, casualties, and the destruction of military equipment, also these two countries encountered failing to implement their goals (Tepperman, 2010).

According to the Pentagon, the U.S. had approximately two thousand military casualties and twenty thousand wounded from 2001-2018 (Wikipedia, 2020). Also, the Americans sank to the swamp of Afghanistan without any remarkable success. Whereas, some statistics show the Soviet Union casualties were around fifteen thousand killed and fifty-three thousand wounded. The Soviet Union did not achieve its aims with these a lot of expensive and victims (Wikipedia, Soviet–Afghan War, 2020).

## **5. THE 11<sup>TH</sup> SEPT 2001 INCIDENT AND THE US RESPONSE**

The experiences of 11<sup>th</sup> Sept 2001 remained a turning position in US foreign policy and world relations. Unipolar set the USA on a new level in which it emerged as a hegemonic power. There was no clear enemy or rival that the United States and its politicians could pursue their policies and theories. America was in a theoretical crisis within its foreign policy. Therefore, there was a high percent possibility that it would operate by a new urgency in the new unipolar world as the hegemon of the world. The period of USA theoretical dissertation lasted a decade, the beginning time is with the collapse of the USSR as a particular competition to the US in 1990, and endured till 2001 when 9/11 happened.

After the termination of the Cold War in the world, the deterrence period appeared to a result. By the consequence of the 11th Sept, ideologists asked a new opinion that affirmed Dr. Bush and the doctrine of a pre-emptive strike, so paving the space for the 20th-century US hegemony in the world. For the generation of the Americans, the 11th Sept means a remarkable, dread, and memorable time in

the US past. On that indispensable day, the US was attacked in similar a path, that it disturbed all of the Americans, an invasion from within the set goals that they never imagined (Temna, 2006).

A series of occasions accomplished in the United States on 11th Sept, which destroyed two 110-story towers at the World Trade Center and caused \$ 400 billion in material damage and the painful losses of thousands of common persons. It was an adventure that has so far been complicated by global operations that had not seen before. The uniqueness of these attacks was in the type of goals that the designers chose because the set of aims had a very high value. During these towers, forty thousand people were employed daily, and one hundred and fifty thousand people moved in them every day (Betty Houchin Winfield, Barbara Friedman & Vivara Trisnadi, 2002). Then, George W. Bush looked on the media and claimed that the assaults have been designed by al-Qaeda and terrorist groups. And said, "We will go to war with those who have waged war against the United States, and we will pull the terrorists out of their holes" (James N. Schubert Patrick A. Stewart Margaret Ann Curran, 2002). Succeeding the Taliban's unwillingness for handing over Bin-Laden to American administrators, the arrangements for the military strike on the different parts of Afghanistan were in full swing.

The 11th Sept attacks marked a turning point in the United States foreign policy. With the breakdown of the Soviet Union, the US power in its foreign policy increased. Also, in the lack of definite powers against the United States in the international system. The US was capable to better and faster implement its plans and policies. The events of 11th Sept were considered the new era of Pearl Harbor, and shaped the position of the American bases in the sphere of global relationships and also diplomacies more noticeable and impression (Martin, 2001). There are some reason for the stay in Afghanistan.

### **5.1. US Political-Security Interests in Afghanistan**

One of the main goals of the United States in Afghanistan is to set pressure on China and Russia and to cease them from expanding their impact and role in the growths of Central Asia and the Middle East. The United States concerns about China's closer proximity to Russia, which could diminish the stability of power and would harm the US if great powers integration continued to form. The US regards Afghanistan as a gateway to reach Central Asia. The US sees its interests in Afghanistan merely in a long time (Saima Parveen, Syed Akhtar Ali Shah, Jehanzeb Khalil, 2020).

In other words, reaching the aspired objects needs the US to have a permanent and ongoing presence in Afghanistan and other Central Asian countries. The traces of the discourse of competition between civilizations to achieve economic and military goals can still be seen in the United States foreign policy. From this perspective, both interests and values of Asian and Russian civilizations have prompted the USA to see behind the power of these countries and determines steps to confront

their increasing influence and power. Afghanistan is as the gateway to Central Asia, has attracted the consideration of American policymakers (Simon, 2009).

In this way, the United States is taking advantage of many crises as a tool to increase its role and control other powers in the region. Therefore, it re-entered into a strategic pact between the USA and Afghanistan. Currently, the US has an agreement with the Taliban in the name of the peace agreement, and that proves the USA keen to stay Afghanistan for a long time with a different pretext. The United States officials' systems are utilizing the prerogative of the hostile condition in Afghanistan to go forward with their macro-goals and policies.

### **5.2. US Economic Interests in Central Asia with Presence in Afghanistan**

Despite oil and gas have not been the reason for the US attack Afghanistan, this country has a fundamental feature to play in the USA plans to keep the rule of much of Central Asia's oil and gas properties. In the case of Turkmenistan's oil and gas sector in northern Afghanistan. For more than a decade, the United States has been seriously pursuing plans by trade groups for oil pipelines from Turkmenistan to the Arabian Sea through Afghanistan and gasoline from Turkmenistan and Afghanistan to Pakistan. This pipeline in the interests of the United States is for these reasons: Withdrawing Central Asian's oil directions from Russian influence and strengthening the USA position in the region, hindering the expansion of Iran regional influence by preventing the Turkmenistan-Iran gas connection. By thwarting the Turkmenistan-Iran oil pipeline project to the Arabian Sea (Northeast of the ocean India between the Arabian Peninsula and India), diversifying the United States' oil and gas resources, and thereby increasing production. That helped to keep prices down, making a profit for construction and oil companies, providing the basis for economic prosperity (Tanter, 2001).

## **6. US-TALIBAN PEACE DEAL**

After nearly twenty years of war in Afghanistan, the US became weary to continue this long war. Finally, after two years of negotiations, started and finished in the capital of Doha, Qatar, the USA signed an agreement with the Taliban group on 29th February 2020. The peace agreement includes four pages. Some profound and crucial issues need to mention. Firstly, the United States, its allies, and coalition partners will depart from five base points of Afghanistan within fourteen months. Also, these fourteen months include two stages. First, The US forces will decline from fourteen thousand to eight thousand and six hundred within four months and fifteen (135) days. Second, the leftover troops will leave this country within nine and a half months. The next accord among them is the release of five thousand Taliban prisoners from Afghanistan's jails. Taliban also will release a thousand captives. Moreover, other issues mentioned in the document, such as the Taliban group, must cut off their relations with other terrorist groups. The next matter discussed in the negotiation is the

US positive relations with the new Afghan Government (Emma Graham-Harrison, Dan Sabbagh, Akhtar Mohammad Makooi and Julian Borger, 2020).

This deal seems ambiguity because the US suddenly leaves Afghanistan after near two decades of presence with a little achievement in different parts as well as a lot of spending and casualties. That means the US failed to implement its plans, and if spend more time in this country, will harmful to it. Almost after two decades of America's presence with expenses and failings in Afghanistan, now looking to leave this country, but an exit that does not impose costlier (Ari Heistein, Eldad Shavit, and Daniel Shapiro, 2020).

According to the Pentagon, the United States had approximately more than two thousand military casualties and twenty thousand wounded from 2001 to 2018. (Wikipedia, 2020). Also, the Americans sank to the swamp of Afghanistan without any remarkable success. Therefore, the United States wants to repeat the Soviet Union's experience without any plan for the vacuum of power. Two problems may create after the United States withdrawal from Afghanistan. First, the possibility of filling the vacuum power by other regional hegemonies such as China, Russia, India, Iran. This filling of the vacuum of power by the US rivals will be an enormous challenge for its hegemonic power. Thus will diminish its activities in the region. Second, the power vacuum will create several radical groups in the area, and this issue can be a vast threat to America's security.

## **7. CONCLUSION**

The United States penetrated this country under the pretext of terrorism. During less than a month, it was able to overthrow the Taliban government and liberate so-called Afghanistan. The excuse of fighting terrorism was the only American weapon to enter Afghanistan, while the United States pursues goals other than the fight against terrorism. In the shadow of this fight, some of which were mentioned respectively. It is a simplistic vision to imagine that the USA will leave Afghanistan and the region after the accomplishment of its mission. Because the 11<sup>th</sup> Sept 2001 assaults and their link to al-Qaeda shaped a golden opportunity for the United States to fight terrorism and presence in the region. Even while the definition of terrorism still does not define properly, so there is no guarantee to lead to the elimination and destruction of terrorist groups. The US and the western countries are seeking to foment unrest to justify their continued presence in the region.

That is the idea of colonialists who have profited. By creating a crisis behind the scenes in the region, they are attempting to keep their occupancy in the area under the pretense of fighting terrorism, human rights, and in the name of ensuring order. Thus, after nearly 20 years of war in Afghanistan, the US becomes exhausted to continue this long war. Lastly, the US signed an agreement with the Taliban group, after two years of negotiations on 29th February 2020, which started and

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finished in Doha, Qatar. Almost behind two decades of America's presence with a lot of expenses and fails in Afghanistan, the United States as well as looking to leave this country, but an exit that does not impose more expensive. As well, the Americans sank to the swamp of Afghanistan without any remarkable success. Thus, the United States wants to repeat the Soviet Union's experience without any plan for the vacuum of power in this country. The Afghanistan geopolitical position is forever indispensable. So, that is ambiguity whether the US will leave Afghanistan or no, or this peace deal is another game.

Given all details before, the problem of terrorism, also geographical position. All of these have been included in a collection called Geopolitics, multiplies the greatness of Afghanistan for the US. Accordingly, we would not be confused if we mention the geopolitical situation. Afghanistan and its abilities have cheered and encouraged Americans to infiltrate the region.

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**RUSSIA'S FOREIGN POLICIES UNDER VLADIMIR PUTIN BETWEEN 2000 – 2008**

**Mohammed Kamal Alhassan<sup>1</sup>**

<sup>1</sup>European University of Lefke, Ghana, amkamal20007@gmail.com, icoaef@gmail.com,

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**ABSTRACT**

*Russia has a very rich culture and history from the time of the East Slavs. The most significant event is no doubt the Russian revolution in 1917 which established the Soviet Union. The country has seen different leaders who have contributed to the development of the country. The aim of this study is to analyse the foreign policies of Russia between 2000-2008 under Vladimir Putin. The man who is sometimes referred to as the “strong man of Russia” has contributed significantly to the economic development of the country. His foreign policies will be examined vis-a-vis the conceptual frameworks of foreign policy and to ascertain its impact on the international scene. Traditionally, the Russian state has been associated with the liberal and nationalist approaches to foreign policy. Most of Vladimir Putin’s predecessors especially those who came after the collapse of the Union of Soviet Socialist Republics (USSR) adopted the liberal approach. This meant that they offered very little challenge to Washington’s hegemonic power. This study will offer an insight into what pertained during Vladimir Putin’s era. It uses qualitative method of analysis to examine Vladimir Putin and Russia's foreign policies between 2000-2008. It would be established whether he achieved a balance of power on the international scene. Furthermore, the study will examine whether these policies were*



*effective in challenging Washington's hegemonic power. Finally, using qualitative method of analysis, the study will prove that indeed Russia challenged the hegemony power of the US under Vladimir Putin between 2000-2008.*

**Key Words:** Foreign Policy, International Relations, National Interests, Power, Cooperation

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## **1. INTRODUCTION**

The foreign policies of a country are particularly important because these define its relations with other nations. According to Chancellor Otto Von Bismarck, the foreign policies (FP) of a country are a continuation of its domestic policies. The FP of any country should therefore reflect its norms, culture, beliefs, and traditions. These policies can make or unmake economic development and prosperity of the nation. According to Hoffmann, international relations is concerned with the external policies of countries which affect other countries (cited in Ahmed, J., 2019: 787).

Norman Hill, views FP as the formulation and implementation of policies which shape the behavior of states while negotiating with other states with the aim of protecting its own national interests (cited in Ahmed., J., p. 787). Russia pursued different FP during the Soviet and post-soviet era. The aim of this study is to critically analyze these FP and compare them to those pursued by Vladimir Putin during his tenure of office. According to Einsiedel, Malone and Ugarte (2015), since ascending to power Vladimir Putin has pursued FP which are not in conformity with the interests of the western world. As a result of this, he often faces criticisms from US and its allies.

## **2. EURASIANISM AS THE CORNERSTONE OF RUSSIA'S FOREIGN POLICY**

Eurasianism is a Russian school of thought which became prominent in the events leading to the collapse of the Soviet Union and afterwards. This philosophy maintains that Russia is culturally closer to Asia than Western Europe. According to Ozsaglam, M.T (2015), this theory was propounded by Alexander Dugin and has been generally accepted by the ruling class in Russia. Even Vladimir Putin's foreign policy decisions were informed by that philosophy. The net- effect of this is that no matter who is in power in Russia, Western Europe is seen as a competitor rather than a partner.

### **3. RUSSIA'S FOREIGN POLICIES BEFORE VLADIMIR PUTIN**

#### **3.1. Liberal Approach**

The Russian state used the Liberal approach in its FP with US and NATO before Vladimir Putin's tenure of office. This approach emphasized a robust market economy, democratization, and the protection of human rights. Moreover, civil, and political rights were also guaranteed under this approach.

The liberal approach was proposed by the first post-soviet Foreign affairs Minister, Andrei Kozyrev. It argues that even though there might be differences between Russia and the west that does not call for any hostilities between them. According to Andrei Kozyrev (1992), Russia and the west have the same interests and so need to work together. He goes on to propose to Russia to cooperate with the west in order to ensure economic development and prosperity. This approach sees the west as a partner rather than a competitor.

#### **3.2. The National Approach**

The nationalist approach sees Russia as different from the west. According to this approach, Russia has its own culture and traditions and should therefore stick to them. It goes on to warn Russia not to emulate the west but see it as a competitor and not a partner. According to the nationalist approach, the aim of the west is to destroy Russia so it also encourages Russia to adopt its own economic models and not to adopt that of the west. As such models are alien to the Russian people, it argues them to strive hard to be self-sufficient and not to depend on the west. Yuri Glukhov (1992) says that the national approach recommends that in any situation, Russia's interests should supersede any other interests. He goes on to say that the west can not be trusted to solve Russia's problems and that only Russia can solve its own problems.

### **4. RUSSIA'S FOREIGN POLICIES DURING VLADIMIR PUTIN'S ERA**

According to Spechler (2010), Vladimir Putin's foreign policies went through four (4) distinct phases. These were targeted at the west especially United States of America (US) and the North Atlantic Treaty Organization (NATO). The first image approach in international relations puts emphasis on the role of a leader as the initiator of all policies. The proponents of this leader centric approach enumerate several reasons why the role of the leader is crucial in FP. According to Parasiliti, Byman and Pollack (2001), the leadership of any country affects state objectives, strategies, diplomatic and military capabilities. For example, while the predecessors of Putin saw China as a competitor, he rather saw that country as a partner. As a result of this, these two countries worked together to achieve mutual FP objectives.

#### **4.1. Consolidation (2000 - 2001)**

When he ascended the presidency, Vladimir Putin tried to consolidate his position and perpetuate his rule. He was therefore mainly concerned with domestic policies. He tried to renew Russia's strength and revitalize its social, political, and cultural foundations. The Russian orthodox church was also given a key role to play in energizing the people through religion.

The re-awakening of the Russian people was his priority and so was his desire to promote the role of the Russian orthodox church.

There were some issues that Russia had to contend with during the consolidation stage and these included:

- . The bombing of former Yugoslavia
- . The expulsion of fifty (50) Russian "spies" by the west
- . The US proposed withdrawal from the anti-ballistic missile treaty (ABM)
- . The US desire to build a national missile defense system (NMD)
- . The intended eastward expansion of NATO

After, consolidating and perpetuating his rule and strengthening the social, cultural and political foundations of the country, Putin set his eyes on the global arena. The activities of the Chechnya separatist movements were now undermining Moscow's authority. As a result of this, Putin needed to adopt a different approach in Russia's FP.

#### **4.2. Realist Approach (2001- 2002)**

Vladimir Putin in his desire to cooperate with US adopted the realist approach in FP. This approach promotes friendship with US. It explains that Washington does not seek to destroy Russia despite the fact that the two nations have divergent interests. Also, according to the spirit of cooperation, they could still work together. This approach to FP was articulated by Igor Ivanov, the Russian Foreign affairs Minister from 1998- 2004. The realist approach also emphasizes the use of diplomacy and cooperation and the skills of political leadership in negotiations to achieve specific national interest objectives.

According to this approach, Russia must try to resist the hegemonic powers of US but if it fails, Russia can still benefit by shaping US policy and actions.

It also advocates the use of negotiations in exchange for supporting US position on specific issues. According to Igor Ivanov (2002), instead of building coalitions to curtail US power, the approach rather recommends cooperation with America. This way, Russia will be in the best position to influence US policies and actions.

The Chechen separatist movements presented Putin with a situation which compelled him to cooperate with the west. This opportunity finally came after the September 11, 2001, when Islamic extremists attacked the World Trade center and other targets in the US. According to Spechler (2010) one of the reasons why Putin adopted the realist approach to FP was to help him get the support of the west in crushing the Chechnya separatist movements. As a result of this, Russia's FB changed after September 11, 2001. Andrew F. Tully (2001), alleges that Putin pledged his support and also resolved not to oppose US in setting-up military bases in any former Soviet republic. According to Dinesh, alliances play a major role in shaping the FP directions of any country (cited in Sotong M., 2013).

Putin resolved to cooperate with the US on its war on terror. He promised to share intelligence with US on Taliban, Al-Qaeda, and Afghanistan in a televised address to the nation. Moreover, Putin openly conceded that it was the beginning of cooperation between the two countries.

He went further to say that even the US withdrawal from ABM treaty would afford US the readiness to respond to threats from future terrorist attacks (David Sanger, 2002). Due to this reason, Igor Ivanov, the Russian Foreign Affairs Minister announced "the emergence of a new world order" (Todd Purdem, 2002).

#### **4.3. Great Power Activism Approach (2002-2003)**

Putin's cooperation with US and its allies lasted within a short time as Moscow began criticizing Washington again. According to D'Estaing, V. G., Nakasone, Y., & Kissinger, H. A. (1989), the world is in a cycle of change and countries must therefore change their relationships with other nations based on circumstances. Under the Great power activism approach to FP, Russia saw the US and its allies as competitors. This approach was first proposed by Yevgeni Primakov, who was the Foreign Minister of Russia from 1996- 1998 and Prime Minister from 1998-1999. The great power activism is concerned with the struggle for power in international relations. This simply meant that Russia had to engage in a struggle for power with US for world dominance. Putin used this approach to develop economic and military alliances with countries considered as enemies of US,

Constructivists and Liberal institutionists stress the important roles played by Intergovernmental Organizations such as the UN. As a result of this, Russia became pro-active in the UN. Using its veto power to frustrate US plans in a bid to demonstrate the power of Russia. According to Yevgeni Primakov (2001), the Great power activism calls for a cool but limited relationship between Russia and US because a direct confrontation with Washington was not convenient for Moscow.

Under this approach, Moscow rejected the US intervention in Iraq. Putin also rejected calls by US to join an intervention coalition in Iraq. He also travelled to Germany to meet Chancellor Gerhard Schoeder of Germany and meet Jacques Chirac of France to campaign against US intervention in Iraq.

Moreover, Putin threatened to use Russia's veto power in the SC to block the US-led invasion of Iraq. According to Arkady Dubnov and Pyotir Rozvarin (2003), he also rejected a US call to Saddam Hussein to dismantle his weapons of mass destruction (WMD) and give UN inspectors access to Iraqi military installations.

#### **4.4. Natural Resources as a Political Tool (2003)**

To ensure the success of this approach, Vladimir Putin recognized the need for a state-control of the energy sector. That sector was then largely controlled by an Oligarch named as Mikhail Borisovich Khodorkovsky. Khodorkovsky was arrested in 2003 and jailed. The shares of his oil- company Yukos were taken over by the state. According to Hedlund, S. (2014) and Sakwa, R. (2014), Vladimir Putin's strategy of using energy as a political tool was put into play. By 2013, Russia's state-owned oil-company Gazprom was exporting natural gas to the following countries: Estonia, Latvia, Lithuania, Slovakia, Bulgaria, Hungary, Austria, Greece, Czech Republic, Germany, Italy, France, Netherlands and Belgium. As a result of this Vladimir Putin was able to influence the policy decisions of these countries because of the fear of Russia cutting their natural gas supply. Since the success of nationalizing the oil industry, Vladimir Putin has used Russia's natural gas supply to other countries as a political tool. For instance, in 2006 Ukraine was confronted with a fourfold increase in the prices of natural gas by Putin. When Ukraine complained that they could not pay, Russia responded by cutting gas supply to Ukraine.

#### **4.5. The Assertive Approach (2004-2008)**

The assertive approach to FP was proposed by Sergei Ivanov, who was a former defense Minister and Putin's political strategist, Vladislav Surkov. This approach declares US as the greatest enemy of the Russian people.

It also explains that the US and its allies seek the destruction of the Russian people (Surkov, 2006). According to Ivanov and Surkov, US and its allies seek to push towards a change in the political system of Russia. They go on to say that the US will stop at nothing and is even ready to use military force to achieve that goal.

Therefore, according to this approach, Russia should adopt any strategy including the use of military power to prevent US and its allies from achieving that goal. According to Valery Chernikov (2007), this approach also advocates for the upholding of Russia's national interests in situations where Russia works together with US and its allies. Russia must not compromise its position and make any concessions to appease US and its allies.

Also, in applying this approach, Putin put the deterrence policy under the Soviet-era into practice. Russia intervened and invaded Crimea citing national interests. Although Crimea was under

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Ukraine, majority of those living on the Island are native Russians. This therefore gave him an excuse to invade and turn it into a de facto Russian territory.

Putin also deepened Russia's relations with China. According to Einsiedel, Malone and Ugarte (2015), Russia and China's close relationship was clear because the two cast six (6) joint vetoes between 2007-2014. Russia used its veto at the SC to block any resolution on Crimea. Putin also had military cooperation and sold sophisticated military technology to China. According to analysts that act was a challenge to US hegemonic power.

Putin also dropped a large missile on Georgia and shot down a Georgian spy-plane over Abkhazia in 2008 (Mikhail Vignansky, Mikhail Kukushin and Andrei Denisov, 2006). Even though Putin had given NATO the green-light to expand eastwards under the realist approach to FP, he now warned NATO to refrain from doing so. This was seen by Analysts as a slap in the face of US and a challenge to its hegemony.

Finally, Russia under Vladimir Putin implemented some policies with the aim of protecting its interests on the international scene. These were well calculated policies to announce Russia's adoption of the assertive approach to FP. These were some of them:

- . Russia moved to threaten commonwealth of Independent States (CIS) members of its intentions of cutting down natural gas supply to these countries if they cooperate with US and its allies.

- . Putin concluded an agreement with Syria to re-open a Soviet-era military base in that country.

- . Also, Putin made a trip to Saudi Arabia, a key US ally in the middle east to discuss the future of that region. This was aimed at courting Saudi Arabia to be on Russia's side.

- . Furthermore, he invited the new leaders of Hamas who had won elections in Palestine to Moscow even though US and its allies refused to recognize the new government.

- . To crown it all, Putin invaded Georgia in 2008 despite opposition from US and its allies to protect its interests. This proved the fact that Russia was now at a full circle with its assertive approach in FP.

## **5. CONCLUSION**

The current Russian President Vladimir through his training a Russian Secret service (KGB) agent in Berlin to the Mayor of Moscow, has achieved a feat unmatched by any leader in the history of Russia. According to Spehler (2010), his FP changed based on the situation on the ground. He was there to negotiate when he needed to and used the stick when circumstances warranted it. From what has been discussed so far, one can safely conclude that Russia's FP under Putin between 2000-2008

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were highly successful. This was seen in the incessant use of hard power in the face US resistance. This way, Russia proved to the world that the era of US hegemonic power was long gone.

Moreover, in Russia Putin is seen as the defender of the poor and the vulnerable in the society. Many ordinary Russians have moved up the poverty ladder during his Presidency because of the many pro-poor policies that he implemented. On the international front, he has proven to be a hawk and sometimes a dove as the situation may demand. To the “strong man of Russia,” I say well done and more grease to your elbow. I am sure now more than ever that posterity will prove Vladimir Putin to be the best President that Russia has ever seen.

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## **THE THEORY OF SOCIAL DEMOCRACY AND WELFARE STATES**

**Mohammed Kamal Alhassan<sup>1</sup>**

<sup>1</sup>European University of Lefke, Cyprus, amkamal20007@gmail.com

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### **ABSTRACT**

*Social democratic and welfare states have become very important in delivering development and improving the quality of life in our contemporary world. First of all, the aim of this paper is to trace the historical background of this important political theory. This will include the key contributors and the timelines to its development. Also, the study will analyse the contributions and the criticisms which are often labelled against social democratic and welfare states in our contemporary world. This will be done using qualitative and quantitative data analysis. What we see today in all political systems is the introduction of deliberate policies and programs to redistribute incomes and cushion the poor and most vulnerable in societies. As a result of this, the study uses qualitative and quantitative data analysis to prove that social democratic and welfare states are very relevant in our contemporary world.*

**Key Words:** *Social Democracy, Welfare States, Policies, Government*

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## **1. INTRODUCTION**

The study of political theory has been characterized by intrigue since the time of Aristotle, Plato and John Locke. It provides an area of study that is so diverse and highly opinionated. However, what is clear in the contemporary world is that we need political theory more than ever. This is against the backdrop of the fact that human societies, behaviours and actions have become so complex and very difficult to predict. There is therefore the need for a social revolution based on deliberate systemic socialization by the social democratic class (Tingsten,1973: 131. cited in Przeworski.1986: 32).

According to Beitz (1999: 3), this is due to the “increasing insensitivity of domestic societies to external economic, political and cultural events, the widening gap between rich and the poor countries, the growth centres of economic power beyond the effective regulation and the appearance of serious shortages of food and energy”.

As a result of this, political theorists have a herculean task to provide answers to these serious problems especially how to bridge the ever-widening gap between the rich and the poor. The political theory that has proven over the years to have an antidote to these problems is social democracy (SD). The social democratic theory as it exists today, has gone through different stages in its development.

## **2. SOCIAL DEMOCRACY**

Jonathan Garber., (2019), defines SD as a system in which governments elected democratically as we have in Sweden and Denmark, use extensive state regulations to redistribute incomes without destabilizing economic growth. From the definition, it is evident that in any social democratic country, the state plays an important role in bridging the gap between the rich and poor. Moreover, such roles

are performed using deliberate policies and programs to enable the poor and the in society to enjoy a reasonable standard of living.

### **3. HISTORICAL BACKGROUND OF SOCIAL DEMOCRACY**

The social democratic theory has its roots from Marxist ideology. The Marxists believed that there exists a class system with the bourgeoisies (factory owners) on one hand and the proletariat (factory workers) on the other hand. They also believed that the bourgeoisie was exploiting the proletariat class as the latter was paid low salaries and little benefits. The Marxists predicted that there would be a revolution by the bourgeoisie to overthrow the tyranny of the factory owners

There were disagreements among the Marxists partly due to the introduction of suffrage in the 19th century. “At best many thought universal suffrage one of the instruments among others albeit one that had” (Przeworski., (1986: 9) “the comparable higher merit unchanging the class struggle” (Tingsten., (1973., cited in Przeworski., (1986: 9).

The suffrage that was introduced therefore placed sovereignty in the hands of the factory workers because they instantly became those who elected their leaders. One other reason that changed the minds of some of the Marxists was the exploitation of the ruling class that had replaced the exploitation of the bourgeoisie. People saw at first hand the atrocities and suffering that factory workers were going through even after Russian revolution in 1917.

These new developments caused a split in the Marxist front. Those who felt there was the need to reflect on and change the philosophy of a violent overthrow of capitalism became social democrats (reformists). On the other those who still believed in the revolution to overthrow capitalism or the classical Marxists later changed their name to become communists.

The social democratic theory is distinct from Marxist leftists' ideas because they believed in electoral participation. According to Przeworski, (1986: 10) parliamentary battles was what Marx called “parliamentary cretinism” (Marx.1952a: 77, cited in Przeworski,1986: 10).

Moreover, the social democratic theory is also different from Marxists philosophy because the reformists also believed in the use of reforms and evolution to overthrow capitalism. They believed that capitalism would die a natural death so there was no need to overthrow it through violence. According to Benjamin Barber, (1970: 929) surely the concessions made by capitalism annihilated capitalism (cited in Przeworski,1985: 31)

### **4. ERFURT CONFERENCE (1891)**

The Social democratic party of Germany (SPD) adopted the Erfurt program to use legal and political participation to overthrow capitalism during the Erfurt conference of 1891. The leader of the

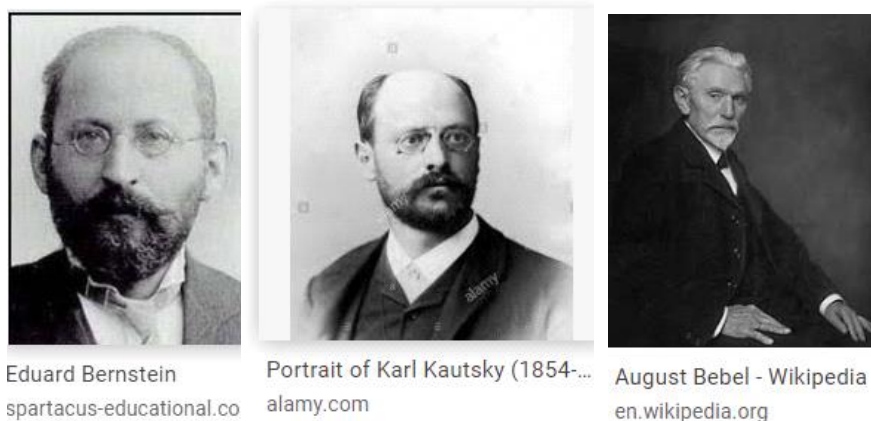
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party was Eduard Bernstein and was assisted by August Babel and Karl Kautsky. The conference adopted the Erfurt programs which shaped the social democratic movement. Some of the highlights of the conference were the adoption of the following which differentiate it from the leftist Marxists theory:

- The believe in participatory elections and suffrage.
- The need to use legal and peaceful means such as reforms and evolution to overthrow capitalism.
- The respect for human rights and freedoms.
- The working class becoming the core members of the social democratic movement.
- The need to use social welfare to cushion the poor and the needy in society. Some of the

contributors of the social democratic theory are shown below in fig. 1.

**Fig. 1. Some of the Contributors of the Social Democratic Theory**



The philosophy is concerned with the ever-increasing gap between the rich and the poor. The philosophy professes the use of policies and programs aimed at cushioning the poor and the most vulnerable in the society. In order to perform that task, social democratic countries use welfare states (WFS) as conduits. The next chapter of this study will analyse the important roles played by WFS in operationalizing the ideas of SD.

## **5. SOCIAL DEMOCRACY VERSUS POLITICAL DEMOCRACY**

According to Hewitt (1977), any democratic nation must have the following characteristics: First of all, the executive arm of government must be elected by the people or an institution representing them like the legislature. This is due to the fact that in democracy it is the people who decide those who should rule them. Also, universal adult suffrage and hence secret ballot is a feature of democracy. Finally, the people must choose their leaders through free and fair elections devoid of any manipulations. It can be observed that both Social democracy and political democracy have all these features. What are then their differences?

Parkin (1972), argues that the mere fact that a country practises democracy does not guarantee equity in the distribution of resources. This is because it is only Social democratic parties that have equal distribution of resources as their core mandate. This is aimed at cushioning the poor and most vulnerable in society.

Contrarily, Lipset (1960), maintains that one of the natural effects of political democracy is that political parties tend to introduce policies aimed at equity in the distribution of resources. In my opinion, accountability is very important in governance and political parties must account for their stewardship. This is because whereas Social democratic parties can be held accountable for their inability to redistribute incomes but in a political democracy parties can not be held accountable.

## **6. WELFARE STATES**

According to Dominelli (1991., p.9), WFS are states which use public and domestic policies with the aim of ensuring the well-being of people (cited in Cochrane and Gewirts.,2001., p.6). Giddens., (2013., p.8). On the other Becky Hall., (2020) defines WFS as states that use centrally controlled policies by government like Sweden and Denmark to redistribute income and cushion the poor and the needy in the society. What were then the origin of welfare states?

## **7. HISTORICAL BACKGROUND OF WELFARE STATES**

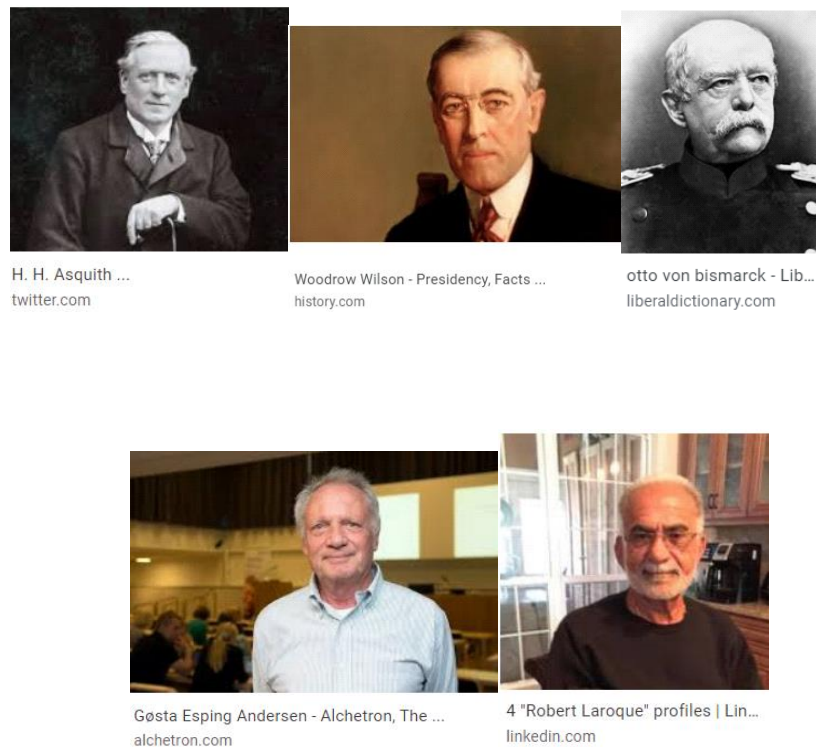
When suffrage was introduced in Europe, ordinary people were given the sovereignty to elect their own leaders. Due to the new earned freedoms, the people demanded for more reforms especially those pertaining to welfare. These incessant demands for welfare were spear-headed by social democratic movements especially those in Germany. The then Chancellor Otto von Bismarck was compelled to introduce welfare in Germany. His concessions were as follows: he introduced National health care in 1883, Accident insurance was in 1884, Old age and disability insurance had it turn in 1889 but in 1927, Chancellor Wilhelm Marx (1863-1946) introduced unemployment benefits. These new welfare policies were later adopted by other European nations.

These were the timelines for the introduction of welfare policies in the Nordic countries according to Alestalo and Kuhnle (1984): In Denmark, Old age pension law was introduced in 1891,

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Sickness insurance was in 1892 and Employers' liability was launched in 1898. For Norway, accident insurance law was introduced in 1894 and for Sweden Sickness insurance law was launched in 1891 (5-6). Some key contributors to the welfare system are found below in fig. 2.

**Figure 2. Some Key Contributors To the Welfare System**



## **8. FORMS OF WELFARE STATES**

According to Esping-Anderson., (1990) there are three (3) forms of welfare states:

- Liberal welfare states
- Conservative welfare states
- Social democratic welfare states (pp. 45-69)

Liberal welfare states like UK and US, give welfare to those who work and therefore contribute. So those who do not work can not enjoy welfare. Also, more benefits are set aside to those who are working and less for those on pension. The conservative welfare system is practiced in Germany, France, Belgium, Austria and Luxembourg. This system fuses some of the features of the other two systems together. What one enjoys as benefit depends on his/her contribution. The social democratic welfare system is practiced by Nordic countries of Norway, Sweden, Denmark and Finland. This system of welfare is by far the most generous as it is universal and automatic for all citizens.

## **9. THE LINK BETWEEN SOCIAL DEMOCRACY AND WELFARE STATES**

The SD philosophy aims at redistribution of income to cushion the poor and the needy in society. It therefore needs a vehicle to haul these policies through and this is where WFS. Therefore, WFS help social democrats to implement their policies.

## **10. FEATURES OF SOCIAL DEMOCRATIC AND WELFARE STATES**

SD & WFS no matter where they have some characteristics that as explained below:

Firstly, these countries respect human rights and freedom of individuals. It is a well-known fact that democratic countries respect freedoms and liberty and according to Esping-Anderson (1990., p.15) “it holds that welfare states are more likely to develop the more democratic rights”.

Also, social justice is a feature of SD & WFS. According to Holm, Liss and Norheim, (1999); Ferrera, (2013)., there is solidarity so that there is a special consideration to the needs of those who have less (cited in EASPD., (2016).

Moreover, these states provide health care benefits to their citizens. This is to help those who cannot afford basic health services have access. According to the ILO report (2014/2015)., the people are protected under general health-care schemes: for instance, the treatment of certain occupational diseases may require specific types of specialist care (p. 55). Finally, the payment of unemployment benefits is also a feature of SD & WFS. Svallfors., S., (1997: 4) agrees that social democratic and welfare states “ensure a reasonable standard of living for the unemployed” and those who cannot find work are also taken care of.

## **11.CRITICISMS AGAINST SOCIAL DEMOCRATIC AND WELFARE STATES**

There is nothing perfect under the sun and for even good theories like SD & WFS also have their shortfalls and sometimes come under criticisms. In criticizing SD & WFS, Hall Becky (2020)., enumerates the following:

- 1.They encourage high unemployment and low productivity
- 2.They encourage welfare fraud
- 3.They discourage citizens from marrying
- 4.There are high tax levels in those countries
- 5.Welfare expenditures are high and unsustainable

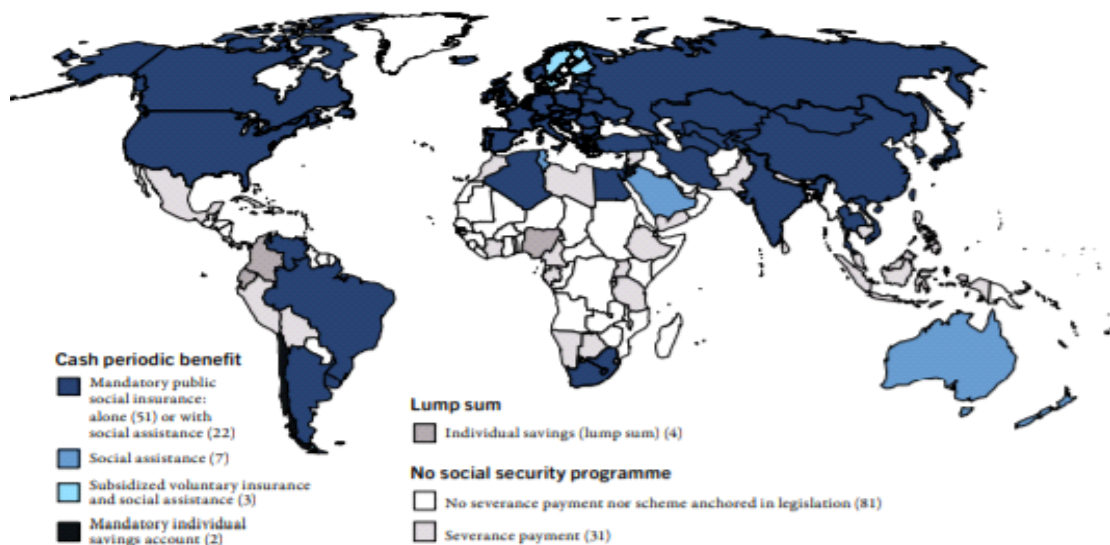
First of all, SD & WFS encourage high unemployment and hence low productivity. This is mainly due to the unemployment benefits that they give to their citizens. As those who are not working can at least receive something at the end of the month, naturally most of the time they will

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refuse to work. According ILO (2014/2015., p. 29)., 28% of the global labour force were potentially eligible for unemployment benefits were 80% in Europe, 38% in Latin America and 21% in the Middle East.

Distribution of unemployment benefits worldwide by type of scheme 2012/2013, fig. 4 below:  
The figure shows unemployment benefits for different countries.

**The Figure 3. Above Proves That Unemployment Benefit Payments are Popular in Europe and in North America**



Note: Figures in brackets refer to the number of countries in each group. Information on the type of programme by country is available in Annex IV, table B.3.  
Sources: SSA and ISSA, 2012; SSA and ISSA, 2013a; SSA and ISSA, 2013b; SSA and ISSA, 2014; ILO Employment Protection Legislation Database (EPLex).  
Link: <http://www.social-protection.org/gimi/gess/RessourceDownload.action?ressource.ressourceId=37034>.

Also, those who criticize SD & WFS say they encourage fraud. This is due to the fact that people collude with some accountants and administrators to inflate the amount of unemployment benefits due them. According to Viechnick et al., (2016)., as much as 137 billion US dollars was lost through fraud, wastage and abuse in the US in 2015 alone. The improper payments in large benefits programs (US) 2005 – 2015, fig. 4 below:

For example, in America, 12.1% of all med care free-for-service involves fraud. Also, in 2015, the government lost 29.1 billion dollars through welfare fraud.



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**Figure 4. The Improper Payments in Large Benefits Programs (US) 2005 – 2015**

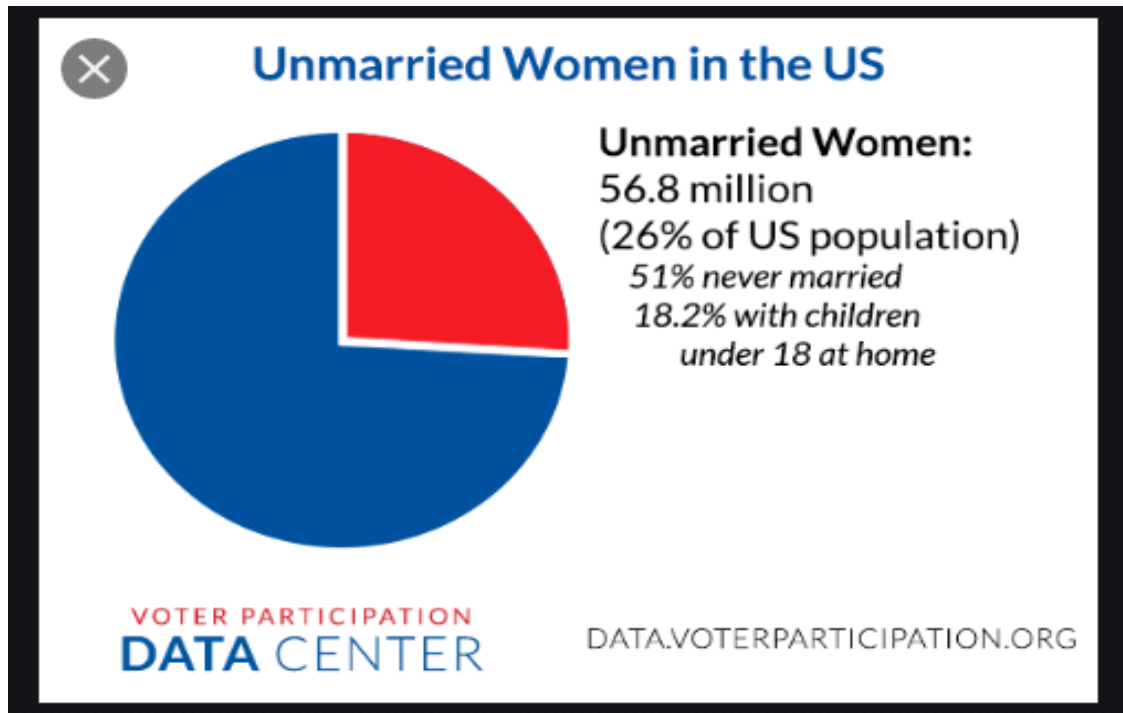
Program	Total outlays in 2015 (in \$ billion)	Improper payment rate in 2015	Total improper payments in 2015 (in \$ billion)
Medicare Fee-for-Service	358.3	12.1%	43.3
Medicaid	297.7	9.8%	29.1
Earned Income Tax Credit (EITC)	65.6	23.8%	15.6
Medicare Advantage (Part C)	148.6	9.5%	14.1
Old Age, Survivors and Disability Insurance (OASDI)	862.7	0.6%	5.0
Supplementary Security Income (SSI)	56.5	8.4%	4.8
Unemployment Insurance (UI)	32.9	10.7%	3.5

Source: Office of Management and Budget, *Office of Federal Financial Management improper payments dataset*.

Furthermore, one other disadvantage of SD & WFS is that they discourage marriage due to the fact that single parents tend to enjoy more benefits than married couples. The net-effect is that most of those raised by single parents are more prone to drugs. Accordingly, the trend is a cycle, as single parents refuse to become married couples.

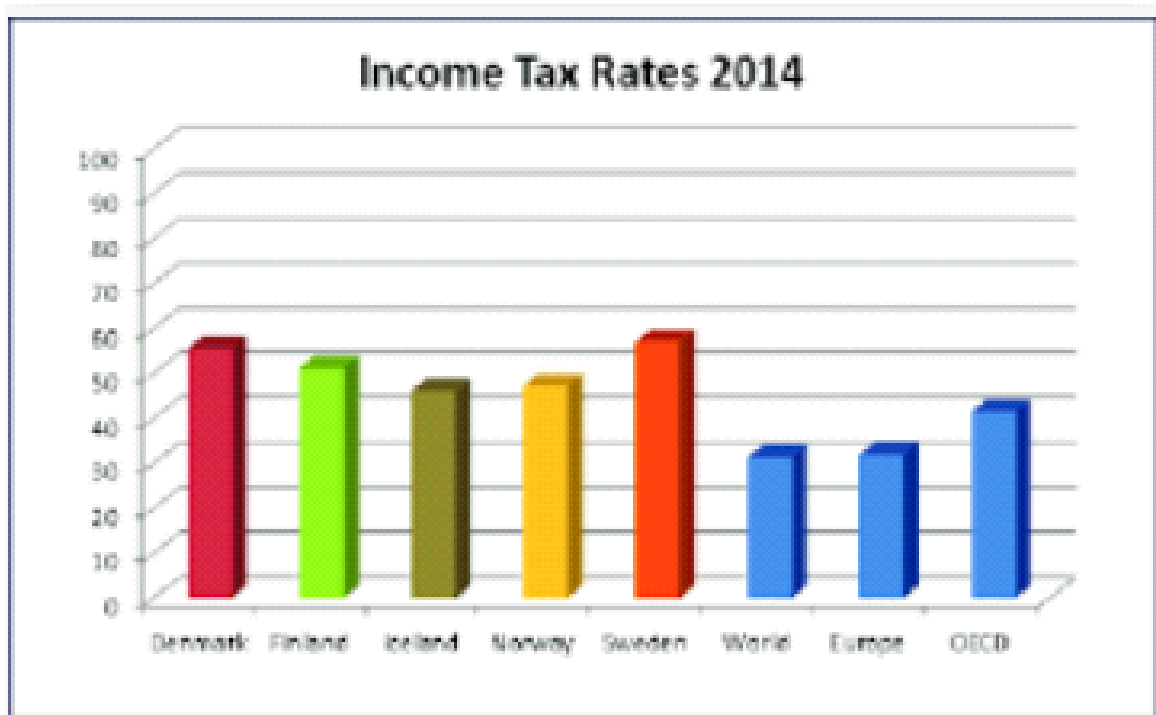
This is due to the fact that those who are single parents enjoy more benefits, people resolve not to marry at all in SD & WFS. The figure below in fig. 5 shows that in US alone there were about 56.8 million women, representing about 26% of the American population who were unmarried. This is because as single mothers they stand to benefit more than as married women.

**Figure 5. Unmarried Women in America**



In addition to these, detractors of SD & WFS say that tax levels are relatively high in those countries. This often due to the fact that most of these countries rely heavily on tax revenue to finance their welfare programs. However, one principle of SD & WFS is solidarity that is those who are rich are willing to pay higher taxes to enable governments to cushion the poor. So that in the end, the poor and the most vulnerable in these societies can also enjoy a reasonable standard of living. In Sweden, as fig. 6 indicates taxes can be as high as 55%.

**Figure 6. Income Tax Rates in 2014**



Tax rates of Nordic countries, world ...  
researchgate.net

Finally, one of criticisms that is often levelled against SD & WFS is that fact that their welfare expenditures are too high and therefore unsustainable in the contemporary world. This is partly true against the backdrop of the fact that most welfare states especially those in the Nordic countries are considering revising and reforming their welfare regimes. In 2013 as fig. 7 indicates, France's expenditure on Welfare in relation to its GDP was about 35%. This figure is very high in relative terms.

**Figure 7. Government Social Expenditure (as Percentage of GDP, 2013)**

## **12.THE RELEVANCE OF SOCIAL DEMOCRATIC AND WELFARE STATES**

Today, even communist states like Russia has made reforms and introduced some level of welfare policies and benefits to cushion the poor and the most vulnerable in society. Moreover, countries like US which hitherto criticized SD & WFS for sharing monies to their citizens have also embraced the introduction of welfare programs. The addition to the list definitely African countries. These countries are also beginning to introduce welfare programs to cushion the poor and the needy in

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their societies. There is therefore no doubt that SD & WFS have had tremendous effects on other countries in the implementation of policies and programs.

### **13.CONCLUSION**

Social democratic and welfare states, no matter where they are do agree that the use of social welfare programs and benefits is the only way to cushion the poor and the most vulnerable in society. History has proven that no matter the form of a political system, that system must embrace reforms, changes and evolution in order to be relevant in the contemporary world.

The founding fathers of the political theories of social democratic and welfare states have been vindicated today because posterity has judged them right. What is needed is for social democratic and welfare states to continue to reform and deal with the changing demands of the people, globalization, economic and demographic changes.

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## **TÜRKİYE'DE PARA POLİTİKASININ ETKİNLİĞİ: FOURIER TERİMLİ VAR MODELİ**

**Prof. Dr. Erdal Tanas KARAGÖL<sup>1</sup>, Dr. Önder ÖZGÜR<sup>2</sup>**

<sup>1</sup>Ankara Yıldırım Beyazıt Üniversitesi, Siyasal Bilgiler Fakültesi, İktisat Bölümü, erdalkaragol@hotmail.com

<sup>2</sup>Ankara Yıldırım Beyazıt Üniversitesi, Siyasal Bilgiler Fakültesi, İktisat Bölümü, oozgur@ybu.edu.tr

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### **ÖZET**

*Bu çalışma, Türkiye ekonomisinde para politikası şoklarının ekonomik aktivite, döviz kuru, dış ticaret dengesi, tüketim harcamaları, borsa endeksi ve fiyatlar genel düzeyi üzerindeki etkilerini 2003Q1-2020Q1 dönemi için Fourier terimli VAR modeli vasıtasıyla incelemiştir. Bu modelde yapısal değişimler keskin kırılmalardan ziyade kademeli dönüşümler olarak düşünülmekte ve spesifik olarak kırılma sayısı tayin edilmesine gerek bulunmamaktadır. Böylelikle yapısal kırılmaların göz ardı edildiği geleneksel VAR modellerinde ortaya çıkabilecek tanımlama problemleri de bertaraf edilebilmektedir. Çalışmadan elde edilen sonuçlar modele eklenen Fourier terimlerinin geleneksel VAR modeli sonuçlarında ortaya çıkan price-puzzle problemini ortadan kaldırmaktadır. Öte yandan, yapısal değişimlerin kademeli dönüşüm süreçleri olarak model dahil edilmesi para politikasının diğer makroekonomik değişkenler üzerindeki etkilerini de farklılaştırmaktadır.*

**Anahtar Kelimeler:** Para Politikası, Fourier VAR, Yapısal Kırılma, Makroekonomik Değişkenler

**JEL Kodları:** B23, E31, E52.

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**MONETARY POLICY EFFECTIVENESS IN TURKEY: FOURIER VAR MODEL  
EVIDENCE**

**Prof. Dr. Erdal Tanas KARAGÖL<sup>1</sup>, Dr. Önder ÖZGÜR<sup>2</sup>**

<sup>1</sup>Ankara Yıldırım Beyazıt Üniversitesi, Siyasal Bilgiler Fakültesi, İktisat Bölümü,  
erdalkaragol@hotmail.com

<sup>2</sup>Ankara Yıldırım Beyazıt Üniversitesi, Siyasal Bilgiler Fakültesi, İktisat Bölümü, oozgur@ybu.edu.tr

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**ABSTRACT**

*This study examines the impact of monetary policy shocks on economic activity, exchange rate, trade balance, consumption expenditures, stock market, and price level throughout 2003Q1 and 2020Q1. The study employs multiple smooth breaks in the VAR model. This model includes structural changes in smooth and gradual processes and does not consider them as sharp changes. Also, the model does not require to identify a specific number of breaks into the analysis. Therefore, the model does not have a misspecification problem. Empirical findings of the study demonstrate that the inclusion of Fourier terms into the VAR model solves the price-puzzle in the Turkish economy. Also, the results of the Fourier VAR model provide quite different results on other macroeconomic indicators in terms of sign and magnitude.*

**Keywords:** Monetary Policy, Fourier VAR, Structural Breaks, Macroeconomic Variables

**JEL Codes:** B23, E31, E52.

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## **1. GİRİŞ**

Politika yapıcılar ekonomi politikası araçlarını pek çok amaç için kullanmaktadırlar. Para politikası, bir ekonomi politikası çeşidi olarak, tüm ekonomilerde fiyat istikrarı ve finansal istikrarın sağlanması, ekonomik büyümenin desteklenmesi ve işsizliğin azaltılması, döviz kurlarındaki dalgalanmaların bertaraf edilmesi gibi pek çok amaç için kullanılmaktadır (Kasapoğlu, 2007). Para politikalarının özellikle fiyat istikrarı ve ekonomik büyüme üzerindeki etkilerinin birçok kanaldan ve altta yatan pek çok karmaşık mekanizma aracılığıyla işlediğinden Bernanke ve Gertler (1995) bu süreç “kara kutu” olarak adlandırılmıştır. Bu bağlamda para politikasında meydana gelen değişimlerin makroekonomik değişkenler üzerindeki etkileri hem akademisyenlerin hem de politika yapıcıların dikkatini çekmektedir.

Türkiye ekonomisi de para politikasının makroekonomik değişkenler üzerindeki etkilerinin analiz edilmesi açısından oldukça önemli bir deney ortamı sağlamaktadır. Şöyle ki, Türkiye ekonomisi 2000’li yılların başında yaşadığı krizler sonrasında mali ve parasal açıdan pek çok düzenlemenin gerçekleştiği bir döneme girmiştir. Bunlar başlıca yeni Merkez Bankası Kanunu’nun çıkartılması, sabit döviz kuru rejiminin terkedilerek dalgalı kur rejimine geçilmesi, enflasyon hedeflemesi rejiminin uygulanması düzenlemelerinden oluşmaktadır (Kara, 2016). 2008 global finansal krizi sonrasında özellikle fiyat istikrarı yanında finansal istikrarın önem kazandığı dönemde Türkiye Cumhuriyet Merkez Bankası (TCMB) tarafından geleneksel olmayan para politikası adımları olarak ifade edilebilecek rezerv opsiyon mekanizması (ROM), faiz koridoru, bankalar arasında farklılaştırılmış zorunlu karşılık oranları gibi farklı uygulamalara gidilmiştir (Varlık ve Berument, 2017).

Böylelikle, son on yıllar içerisinde meydana gelen global finansal kriz ve sonrasında gelişmiş ekonomilerce uygulanan ekonomi politikalarının ortaya çıkardığı etkiler, gerekse Türkiye ekonomisinin hem global hem de iç dinamikler sebebiyle karşı karşıya kaldığı politika şokları para politikasının etkinliğinin analiz edilmesi için bir fırsat oluşturmaktadır. Bu nedenle, literatürde Türkiye’de para politikası şoklarının ekonomiyi nasıl etkileyeceğine yönelik ampirik çalışmalar oldukça yaygındır. Bu çalışmalardan bir kısmı para politikası şoklarının makroekonomik değişkenler üzerindeki etkilerini analiz ederken (örn., Kibritci Artar, 2011; Ülke ve Berument, 2016; Erdogdu, 2017; Tiriyaki vd., 2019) bir kısmı ise para politikasının aktarım kanallarının etkinliğini irdelemiştir (örn., Aktaş ve Taş, 2007; Kasapoğlu, 2007; Cengiz, 2009; Koç ve Şahin, 2015; Atgür ve Altay, 2018).



Bu çalışmalarda inceleme dönemi ve kullanılan yönteme paralel olarak farklı sonuçlar elde edilmekle birlikte, kullanılan ampirik yöntemler içerisinde yapısal kırılmaların analize dahil edilmesi oldukça önem arz etmektedir. Bu çalışmada Türkiye’de para politikasının makroekonomik değişkenler üzerindeki etkileri çeyreklik veriler kullanılarak 2003Q1-2020Q1 dönemi için Enders ve Jones (2015) tarafından literatüre kazandırılan Fourier Terimli Vektör Otoregresyon (Fourier VAR) modeli aracılığıyla incelenmiştir.

Fourier VAR modeli incelenen dönemde meydana gelen yapısal değişimlerin modele keskin kırılmalar olarak eklenmesi yerine bu değişimlerin modele daha yumuşak ve esnek formda dahil edilmesine olanak sağlamaktadır. Öte yandan, inceleme döneminde meydana gelen kırılmaların adedi ve yapısının da önsel belirlenmesine gerek olmaması Fourier VAR modelinin avantajı olarak karşımıza çıkmaktadır (Enders ve Jones, 2015).

Çalışmanın ikinci bölümünde veri seti ve ampirik yöntem tanıtılmış, üçüncü bölümde ampirik sonuçlara yer verilmiştir. Dördüncü bölümde ampirik sonuçların tartışmalarına yer verilirken beşinci bölümde çalışma sonuçlandırılmıştır.

## **2. VERİ VE YÖNTEM**

### **2.1. Veri**

Bu çalışmada Türkiye ekonomisinde para politikasının makroekonomik değişkenler üzerindeki etkileri 2003Q1-2020Q1 dönemi verileri kullanılarak incelenmiştir. Çalışmada para politikası şokuna karşı seçili makroekonomik değişkenlerin tepkileri Fourier VAR modelinden elde edilen etki-tepki fonksiyonlarıyla elde edilmiştir. Çalışmada para politikası değişkeni olarak TCMB politika faizi (INT) kullanılmıştır. Fourier VAR modeline dahil edilen diğer serileri ise Reel Efektif Döviz Kuru (REER), Dış Ticaret Dengesi’nin Gayrisafi Yurtiçi Hasılaya Oranı (TB), Borsa İstanbul (BIST100) endeksi (BIST), Hanehalkı Tüketim Harcamaları (CONS), Tüketici Fiyat Endeksi (CPI) ve Gayrisafi Yurtiçi Hasıla (GDP) değişkenlerinden oluşmaktadır. Çalışmada kullanılan değişkenlerin tanımlamalarına ve veri kaynaklarına Tablo 1’de yer verilmiştir.

Tablo 1. Değişkenlere Ait Bilgiler

Değişken Adı	Kısaltması	Brimi	Veri Kaynağı	Dönüşüm*
TCMB Faiz Oranı	INT	%	IFS	Birinci Fark
Reel Efektif Döviz Kuru	REER	Endeks	EVDS	Birinci Fark ve Logaritma
Dış Ticaret Dengesi	TB	Oran	EVDS	Logaritma
BIST100 Endeksi	BIST	Endeks	EVDS	Logaritma
Hanehalkı Tüketim Harcamaları	CONS	Bin TL	EVDS	Logaritma
Tüketici Fiyat Endeksi	CPI	Endeks	EVDS	Birinci Fark ve Logaritma
Gayrisafi Yurtiçi Hasıla	GDP	Bin TL	EVDS	Birinci Fark ve Logaritma

**Not:** IFS, Uluslararası Para Fonu (IMF) tarafından sağlanan Uluslararası Finansal İstatistikler veri setini, EVDS ise TCMB tarafından sağlanan Elektronik Veri Dağıtım Sistemi'ni ifade etmektedir. \*Yer tasarrufu sağlamak adına birim kök testi sonuçlarına yer verilmemiştir. Sonuçlar yazarlardan temin edilebilir.

## 2.2. Yöntem

Eş anlı denklem sistemlerinin içsel ve dışsal değişkenler tanımlanarak tahmin edilme yöntemi Sims (1980) tarafından eleştirilmiştir. Sims (1980) elde olan örneğin  $m$  tane değişkene birbirinden farklı davranmanın doğru olmadığını, dolayısıyla aynı denklem sisteminde yer alan tüm değişkenlerin içsel değişken olarak tanımlanması gerektiğini ifade etmiştir (Gujarati, 2014). Değişkenler için ortaya çıkacak bu tanımlama problemini çözmek için Vektör Otoregresyon (VAR) modelleri tanımlanmıştır. Sims (1980) tarafından literatüre kazandırılan bu modelin işleyişi şu şekildedir:

İki seriden oluşan bir denklem sistemi düşünelim. Bu seriler  $Y_t$  ve  $X_t$  olsun (Enders, 2014):

$$Y_t = \beta_{10} - \beta_{12}X_t + \alpha_{11}Y_{t-1} + \alpha_{12}X_{t-1} + \varepsilon_{Yt} \quad (1)$$

$$X_t = \beta_{20} - \beta_{21}Y_t + \alpha_{21}Y_{t-1} + \alpha_{22}X_{t-1} + \varepsilon_{Zt} \quad (2)$$

Burada  $\varepsilon_{Yt}$  ve  $\varepsilon_{Zt}$  beyaz gürültü terimleri ve  $Y_t$  and  $X_t$  ise durağan serilerdir.

Bu sistemde hem  $Y_t$  hem de  $X_t$  birbirini etkileyebilirler. Yani,  $Y_t$  ve  $X_t$ 'nin birbirleri üzerinde sürekli etkileri vardır. Dolayısıyla (1) ve (2)'de yer verilen eşitlikler En Küçük Kareler (EKK) yöntemi kullanılarak tahmin edilemez. Çünkü,  $Y_t$  ve  $X_t$ ,  $\varepsilon_{Yt}$  ve  $\varepsilon_{Xt}$  ile ilişkilidir. Bu durumda EKK tahmini eş

zamanlı denklem yanlılığına sebep olacaktır. Bu problemten kurtulmak için birbiriyle ilişkili olan değişkenlerin tarafını değiştirebiliriz.

Gerekli dönüşümleri yaptıktan sonra aşağıdaki standart VAR modelini elde ederiz.

$$Y_t = \gamma_{10} + \gamma_{11}Y_{t-1} + \gamma_{12}X_{t-1} + e_{1t} \quad (3)$$

$$X_t = \gamma_{20} + \gamma_{21}Y_{t-1} + \gamma_{22}X_{t-1} + e_{2t} \quad (4)$$

Burada hata terimleri,  $\varepsilon_{Yt}$  ve  $\varepsilon_{Zt}$ 'nin birleşik şoklarından oluşmaktadır. Aynı zamanda, bu hata terimleri sıfır ortalama ve sabit varyansa sabit olmakla birlikte otokovaryansı sıfırdır.

Geleneksel VAR modellerinde yapısal değişimlerin modele dahil edilmesi kukla değişkenler vasıtasıyla ve dışsal olarak gerçekleştirilmektedir. Ancak Fourier VAR modelinde yapısal değişimler yumuşak ve yavaş geçişkenli olarak modele dahil edilmektedir. Fourier VAR modeli Enders ve Jones (2015) tarafından literatüre kazandırılmıştır. Bu modelde deterministik bileşen olarak Gallant (1981)'in esnek Fourier fonksiyonu dahil edilmiştir.

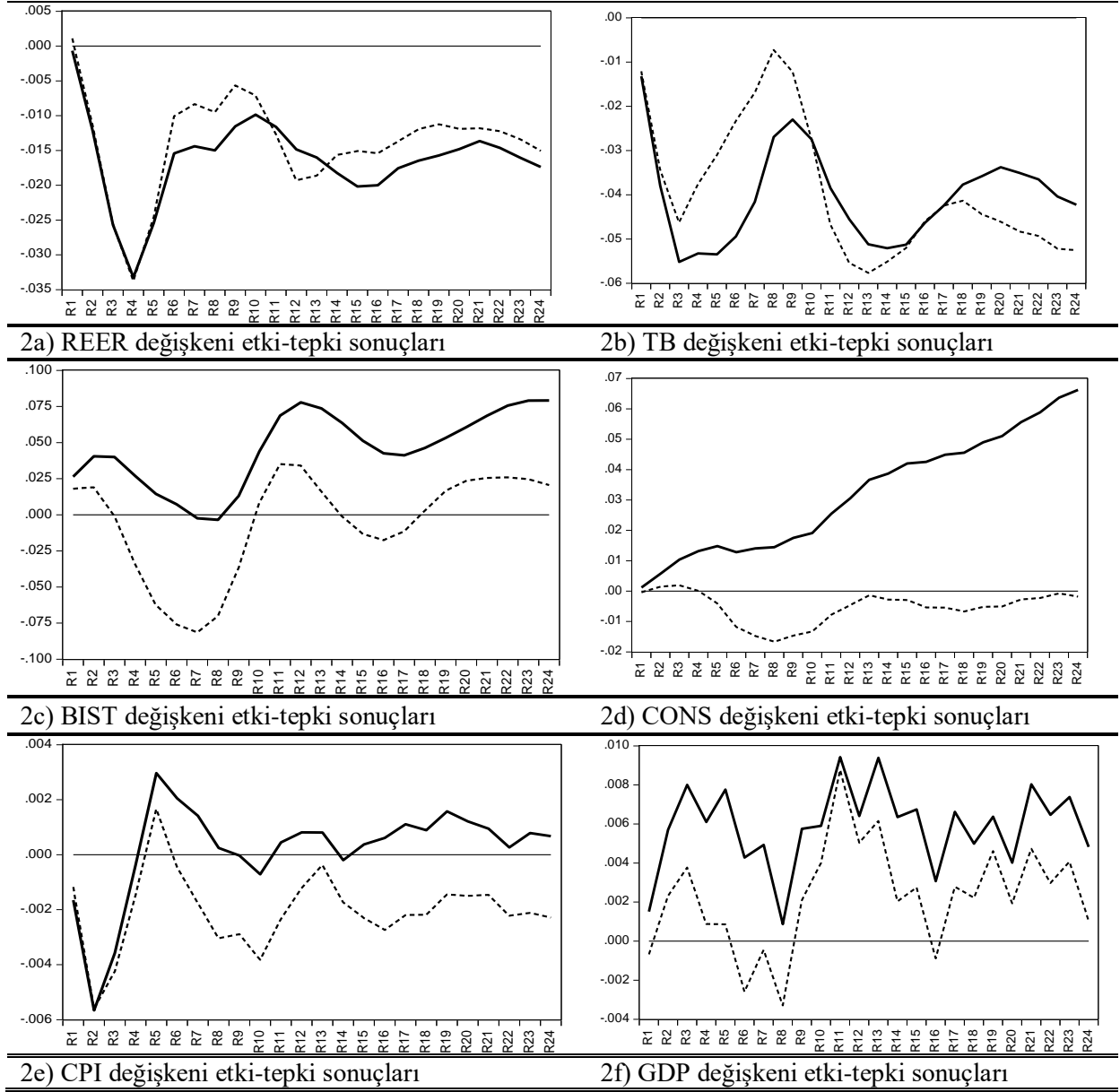
$$d_t = \delta_0 + \alpha_k \sin\left(\frac{2k\pi t}{T}\right) + \beta_k \cos\left(\frac{2k\pi t}{T}\right) \quad (5)$$

Burada k frekans sayısını, t trendi, T örneklem sayısını ifade etmektedir.

### **3. AMPİRİK SONUÇLAR**

Türkiye'de para politikası şoklarının makroekonomik değişkenler üzerindeki etkileri geleneksel VAR modeli yanında Fourier VAR modeliyle incelenmiştir. Bu modellere ilişkin etki-tepki fonksiyonlarından elde edilen sonuçlar Tablo 2'de yer verilmiştir.

Tablo 2. Etki-Tepki Fonksiyonları Sonuçları



Tablo 2’de, modele dahil edilen her bir makroekonomik değişken için parasal genişlemeyi temsil eden negatif faiz şokuna ilişkin etki-tepki fonksiyonları yer almaktadır. Her bir değişken için kesikli çizgiler geleneksel VAR modelinden elde edilen etki-tepki fonksiyonlarını göstermekle birlikte kesiksiz çizgiler ise yapısal kırılmaların Fourier fonksiyonlarıyla modele dahil edildiği Fourier VAR modeli etki-tepki fonksiyonları sonuçlarını göstermektedir.

Reel efektif döviz kuru, dış ticaret dengesi ve gayrisafi yurtiçi hasıla değişkenleri için geleneksel VAR modeli ve Fourier VAR modeli etki-tepki fonksiyonlarından elde edilen sonuçların

birbirleriyle benzerlikler gösterdiği anlaşılmaktadır. Genişletici para politikası şoku neticesinde her iki modelde de REER değişkenin verdiği tepkinin negatif olduğu, diğer bir ifadeyle yerli paranın değer kaybettiği anlaşılmaktadır. Her ne kadar yerli paranın değer kaybıyla sonuçlansa da genişletici para politikasının dış ticaret dengesi üzerindeki etkisinin negatif olması para politikasının dış ticaret kanalının etkin olmadığını göstermektedir. Genişletici para politikasının reel ekonomik aktiviteyi temsil eden GDP değişkeni üzerindeki etkisi ise pozitifdir. Dolayısıyla, genişletici para politikasının ekonomik aktiviteyi canlandırıldığını söylemek mümkündür.

BIST, CONS ve CPI değişkenlerinden elde edilen etki-tepki fonksiyonlarında Fourier VAR modeli ve geleneksel VAR modeli sonuçları birbirinden farklılaşmaktadır. Yapısal kırılmaların göz önüne alındığı Fourier VAR modeli sonuçlarına göre genişletici para politikasının BIST ve CONS değişkenleri üzerinde genişletici etki yarattığı görülmektedir. Genişletici para politikasının GDP üzerindeki genişletici etkisi de göz önünde bulundurulduğunda para politikasının varlık kanalının Türkiye ekonomisi için etkin olduğu ifade edilebilir.

Son olarak, genişletici para politikası şokunun fiyatlar genel seviyesi üzerindeki etkisine etki-tepki fonksiyonları sonuçları modele eklenen Fourier terimlerinin geleneksel VAR modeli sonuçlarında ortaya çıkan price-puzzle problemini ortadan kaldırdığını göstermektedir. Bu bağlamda yapısal kırılmaların Fourier terimleriyle modele dahil edilmesinin ampirik sonuçları geleneksel VAR modeline nazaran farklılaştırdığı görülmektedir.

#### **4. SONUÇ**

Para politikaları bir ekonomide fiyat istikrarının yanında ekonomik aktivitenin canlandırılması ve pek çok makroekonomik değişkenin yönlendirilmesini sağlamaktadır. Bu bağlamda para politikası uygulamalarının makroekonomik değişkenler üzerindeki etkilerinin analiz edilmesi oldukça önemlidir. Türkiye 2000 ve 2001 yıllarında yaşadığı krizler sonrasında merkez bankacılığı alanında da çeşitli düzenlemeler yapmış ve fiyat istikrarı problemlerinin giderilmesi amacıyla 2002 yılı itibarıyla enflasyon hedeflemesi rejimi uygulanmaya başlanmıştır.

Özellikle Türkiye gibi geçmişte yüksek enflasyon tecrübeleri yaşamış ekonomilerde para politikalarının etkinliği pek çok akademik çalışmanın da konusu olmuştur. Bu çalışmalardan bir kısmı para politikası değişikliklerinin parasal aktarım mekanizmaları aracılığıyla etkinliğinin analiz edildiği çalışmalar olmakla birlikte diğer gruptaki çalışmalar ise para politikası değişikliklerinin makroekonomik değişkenler üzerindeki etkilerini incelemiştir.

Türkiye ekonomisinde para politikası şoklarının ekonomik aktivite, döviz kuru, dış ticaret dengesi, tüketim harcamaları, borsa endeksi ve fiyatlar genel düzeyi üzerindeki etkilerinin 2003Q1-

2020Q1 dönemi için incelendiği bu çalışmada geleneksel VAR modeline ek olarak Fourier terimli VAR modeli kullanılmıştır. Bu yöntemin başlıca avantajı yapısal değişimlerin keskin kırılmalardan ziyade kademeli dönüşümler olarak düşünülmesi ve spesifik olarak kırılma sayısının tayin edilmesine gerek bulunmamasıdır.

Bu çalışmadan elde edilen sonuçlar modele eklenen Fourier terimlerinin geleneksel VAR modeli sonuçlarında ortaya çıkan price-puzzle problemini ortadan kaldırmaktadır. Öte yandan, yapısal değişimlerin kademeli dönüşüm süreçleri olarak model dahil edilmesi para politikasının özellikle borsa endeksi ve hanehalkı tüketim harcamaları üzerindeki etkilerini de farklılaştırmaktadır. Çalışmadan elde edilen sonuçlar özellikle içsel ve dışsal şoklarla sıklıkla karşılaşılan gelişmekte olan ülke ekonomileri için yapılan çalışmalarda yapısal değişimlerin dikkate alınması gerektiğini göstermektedir.

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## **KÜRESEL FİNANSAL PİYASALARDA BULAŞMA ETKİSİ**

**Eray Gemici, Dr. Öğretim Üyesi (<sup>1</sup>)**

<sup>1</sup> Gaziantep Üniversitesi, İslahiye İktisadi ve İdari Bilimler Fakültesi, Türkiye, gemici@gantep.edu.tr, ORCID: 0000-0001-5449-0568

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### **ÖZET**

*Bu çalışma, gelişmiş piyasalar (ABD, Fransa, Almanya, İtalya ve İngiltere) ve gelişmekte olan piyasalar (Brezilya, Rusya, Çin ve Türkiye) arasındaki finansal bulaşmanın etkilerini 31 Aralık 2002- 31 Aralık 2019 günlük verileri kullanarak incelemeyi amaçlamaktadır. İncelenen dönemde 2007- 2008 küresel finansal krizinin etkisi de göz önüne alınmış ve çalışmanın veri seti kriz öncesi ve kriz dönemi olmak üzere ikiye ayrılarak dinamik koşullu korelasyon (DCC-GARCH) modeli aracılığıyla analiz edilmiştir. Bu doğrultuda hem ABD'den diğer piyasalara olan bulaşma etkisi hem de incelenen piyasalar arasındaki bulaşma etkisi ayrı ayrı incelenmiştir. Ampirik bulgular, kriz dönemlerinde piyasalar arasındaki zaman değişimli korelasyon katsayılarının ortalamasında kriz öncesi döneme göre önemli bir artış olduğunu ve dolayısıyla bulaşma etkisinin olduğunu göstermektedir.*

**Anahtar Kelimeler:** *Gelişmiş Piyasalar, Gelişmekte Olan Piyasalar, Bulaşma Etkisi, Finansal Krizler, DCC-GARCH Modeli.*

**Jel Kodlari:** *C32, G01, G15.*

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**THE CONTAGION EFFECT IN THE GLOBAL FINANCIAL MARKETS**

**Eray Gemici, Asst. Prof. (<sup>1</sup>)**

<sup>1</sup> Gaziantep University, Islahiye Faculty Of Economics And Administrative Sciences, Turkey,  
gemici@gantep.edu.tr, ORCID: 0000-0001-5449-0568

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**ABSTRACT**

*This study aims to examine the financial contagion effect between developed markets (US, France, Germany, Italy, and the UK) and the emerging markets (Brazil, Russia, China, and Turkey) using daily data for the period from December 31, 2002, to December 31, 2019. In the analyzed period, the impact of the 2007 - 2008 global financial crisis was also considered, and the data set of the study was split into two as the pre-crisis and the crisis period and analyzed using the dynamic conditional correlation (DCC-GARCH) model. Accordingly, both the effect of contagion from the USA to other markets and the effect of contagion between the markets in studied were examined separately. Empirical findings show that there is a significant increase in the mean of the time-varying correlation coefficients between the markets in the crisis periods compared to the pre-crisis period and thus there is a contagion effect.*

**Keywords:** *Developed Markets, Emerging Markets, Contagion Effect, Financial Crises, DCC-GARCH Model.*

**JEL Codes:** *O43, O14, O11*

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## **1. GİRİŞ**

Para politikası, optimal varlık tahsisi, risk ölçümü, sermaye yeterliliği ve varlık fiyatlandırması noktasında küresel ekonomi üzerinde önemli sonuçları olan finansal bulaşma (Çelik, 2012, s. 1946) tek bir ülke veya bir grup ülkede meydana gelen bir şokun piyasalar arası bağlantılarda belirgin bir artışa neden olmasına yol açmaktadır (Dornbusch vd., 2000: 178). Bu tanıma göre, bulaşma etkisinin varlığı, ancak bir şoktan sonra piyasalar arası ortak hareketliliğin önemli ölçüde artmasına bağlı olmakla birlikte şokun etkisiyle ortak hareketliliğin önemli bir şekilde artmadığı fakat devam eden yüksek korelasyon, sadece iki ülke ekonomisi arasında güçlü bir bağlantılılığın olduğunu göstermektedir (Forbes ve Rigobon, 2002: 2224). Piyasalar arasındaki ortak hareketleri tetikleyen faktörler Karolyi (2003: 184) tarafından iki şekilde kategorize edilmiştir. Bu faktörlerden birisi ortak küresel faktör olarak sanayileşmiş ülke ekonomilerindeki büyük değişim veya emtia fiyatlarında meydana gelebilecek bir şok, krizleri veya büyük sermaye akışlarını tetikleyebilmektedir. İkinci faktör ise irrasyonel bulaşma olarak adlandırılan makroekonomik veya diğer temel değişikliklerle ilgili olmayan ancak yatırımcıların veya diğer finansal kurumların davranışlarının bir sonucu olarak ortaya çıkan finansal krizleri içermektedir.

Tarihsel süreçte 1995 Meksika krizi, 1997 Asya krizi, 1998 Rusya krizi ve 1999 Brezilya krizi karşısında finansal varlık piyasaları günlük bazda çok ciddi volatilitelere maruz kalmış ve aynı zamanda bu krizler finansal piyasalarda bulaşma dönemlerini de beraberinde getirmiştir (Kodres ve Pritsker, 2002:769). Yaşanan bu krizlerden farklı olarak en büyük ve en etkili ekonomi olan ABD piyasasından kaynaklanan 2007–2009 küresel finansal krizi tüm ekonomileri etkisi altına almıştır (Jin ve An, 2016:179). Nitekim Eylül 2008'den Mart 2009'un başına kadar yaklaşık altı aylık dönemde ABD borsası %43 değer kaybederken, gelişmekte olan piyasalar %50 ve gelişme ihtimali olan piyasalar %60 düşüş yaşamıştır (Samarakoon, 2011:725). Örneğin, İngiltere hisse senedi piyasası yaklaşık %49 ve Rusya hisse senedi piyasası yaklaşık yüzde %52 değer kaybetmiştir (Dungey ve Gajurel, 2014:162). Dolayısıyla kur ve finansal krizler sırasında, piyasalar ve sınırlar ötesi varlık fiyatı değişiklikleri, stabil dönemlere kıyasla açık bir şekilde artış eğilimi sergilemesi analistlerin ve piyasa yorumcularının uluslararası para aktarımında ve finansal krizlerde "bulaşma" hipotezini gündemlerine almalarına neden olmuştur (Corsetti vd., 2005:1179). Diğer yandan kriz dönemlerinde

varlık fiyatlarının ülkeler arası korelasyonlardaki değişikliklerin izlenmesi de uluslararası portföy yönetimi ve risk değerlendirmesi için çok önemli girdiler sağlamaktadır (Yiu vd., 2010:345).

Literatürde bulaşıcılığın test edilmesinde esasen üç yöntem kullanılmaktadır: Birinci yöntemde istikrarlı bir dönem boyunca iki piyasa arasındaki getirilerin korelasyonu hesaplanmakta ve hesaplanan bu korelasyon katsayısının şok sonrası önemli bir artış gösterip göstermediği test edilmektedir. İkinci yöntemde ARCH ve GARCH çerçevesinde ülkeler arasındaki varyans-kovaryans aktarım mekanizması tahmin edilmektedir. Üçüncü yöntemde ise piyasalar arasındaki bağlantılılık, eşbütünleşme vektöründeki değişiklikler ile test edilmektedir (Forbes ve Rigobon, 2002:2227-2228).

Bu çalışmada, Engle (2002) tarafından geliştirilen dinamik koşullu korelasyon modeli kullanılarak piyasalar arasındaki korelasyonların kriz öncesi dönem ve kriz döneminde zaman içinde nasıl bir değişim izlediği incelenmiştir.

Çalışma beş bölümden oluşmaktadır. Çalışmanın ilk bölümü olan giriş bölümünü takiben ikinci bölümde konuya ilişkin literatür incelemesine yer verilmiştir. Üçüncü bölümde çalışmanın veri setine ilişkin bilgiler verilmiştir. Dördüncü bölümde çalışmadan kullanılan yöntem ve analiz bulguları hakkında bilgi verilmiş çalışma sonuç bölümünün yer aldığı beşinci bölümle ile sonlandırılmıştır.

## **2. LİTERATÜR İNCELEMESİ**

Literatürde bulaşma etkisinin varlığının birçok yöntemle farklı piyasalarda test edildiği görülmektedir. Bu yöntemlerden basit korelasyon katsayılarındaki değişimi test eden (Forbes ve Rigobon, 2002; King ve Wadhwani, 1990), VAR modele dayalı (Baig ve Goldfajn, 1999; Favero ve Giavazzi, 2002; Samarakoon, 2011), DCC–GARCH modellere dayalı (Billio ve Pelizzon, 2003; Chiang vd., 2007; Çelik, 2012; Kazi vd., 2011; Naoui, 2010), rejim değişim modellerine dayalı (Guo vd., 2011; Rotta ve Pereira, 2016) çalışmaların olduğu görülmektedir.

Asya mali krizi döneminde Asya piyasaları arasındaki finansal bulaşma etkisini inceleyen 1 Ocak 1990-21 Mart 2003 dönemi için inceleyen Chiang vd. (2007), 1997 Asya mali krizi döneminde finansal piyasalar arasında bulaşma etkisinin varlığını tespit etmişlerdir. Naoui vd. (2010), gelişmiş ekonomiler ve gelişmekte olan ekonomiler üzerinde 3 Ocak 2006-26 Şubat 2010 dönemi için ABD küresel finansal krizi takiben finansal bulaşmayı inceledikleri çalışma sonucunda gelişmiş ekonomiler arasında küresel finansal krizle birlikte yüksek korelasyon bulgusu elde etmişlerdir. Kazi vd. (2011), 17 OECD ülkesi için 2 Ocak 2002-1 Haziran 2009 dönemini kapsayan çalışmalarında kriz dönemlerinde ABD ve OECD ülkeleri arasında bulaşma etkisinin olduğu sonucuna ulaşmışlardır. Aloui vd. (2011), BRIC ülkeleri ve ABD arasındaki finansal bulaşmanın varlığını 22 Mart 2004-20 Mart 2009 dönemi için inceledikleri çalışma sonucunda yükselen ve düşen piyasalarda tüm piyasa

çiftleri için yüksek düzeyde bağımlılık tespit etmişlerdir. Çelik (2012), Döviz kuru piyasalarında 03 Ocak 2005-31 Ağustos 2009 dönemi için finansal bulaşmanın varlığını test ettiği çalışmada, ABD'den gelişmiş ve gelişmekte olan ülkelere bulaşma etkisinin varlığını tespit etmiştir. Mighri ve Mansouri (2013), gelişmiş ve gelişmekte olan borsalar özelinde finansal bulaşmanın varlığını 1 Ocak 2003-31 Aralık 2010 periyodu için inceledikleri çalışmada, kriz dönemlerinde koşullu korelasyonlarda artış olduğu sonucuna ulaşmışlardır. Bekiros (2014), ABD, AB ve BRIC Borsaları kapsamında 5 Ocak 1999-28 Şubat 2011 BRIC borsalarının 2008 küresel krizden sonra daha da entegre hale geldiğini tespit etmiştir. Chittedi (2015), ABD ve Hindistan piyasası arasındaki finansal bulaşmanın varlığını Ocak 2002-Aralık 2011 dönemini kapsayan verilerle incelediği çalışma sonucunda, piyasalar arasındaki korelasyon katsayısının kriz döneminde, kriz öncesi döneme göre arttığını tespit etmiştir. Jin ve An (2016), ABD ve BRICS borsaları arasındaki finansal bulaşma etkisini 02 Temmuz 1997-31 Aralık 2013 örneklem dönemi için test etmişlerdir. Çalışma sonucunda ABD'den BRICS borsalarına doğru önemli bulaşma etkileri tespit etmişlerdir. Kırar ve Çiçek (2017), Üst, üst-orta ve alt-orta gelir grubunda yer alan 12 borsa kapsamında 01 Ocak 2005-31 Temmuz 2014 örneklem dönemi finansal bulaşma etkisini incelemişlerdir. Çalışma sonucunda üst gelir grubu ülkelere yönelik bulaşma etkisinin özellikle kriz döneminde daha fazla olduğu bulgusuna ulaşmışlardır. Trabelsi ve Hmida (2018), 1 Ocak 2004-31 Aralık 2012 örneklem dönemi için Avrupa borsaları arasındaki finansal bulaşmanın varlığını test ettikleri çalışmada, 2008 küresel krizi sırasında tüm piyasa çiftleri arasında ve Avrupa borç krizi sırasında Yunan ve Portekiz borsaları arasında bulaşıcı bir etkinin varlığını tespit etmişlerdir. Mohti vd. (2019), gelişme ihtimali olan piyasalar kapsamında 04 Ocak 2005-27 Nisan 2012 dönemi için finansal bulaşma etkisini incelemişlerdir. Gelişme ihtimali olan piyasaların ABD mortgage krizi ve Avrupa borç krizinden etkilendiği sonucuna ulaşmışlardır. BenSaïda ve Litimi (2020), G10 Ülke borsaları üzerinde finansal bulaşmanın etkilerini 1 Ocak 2000-31 Aralık 2018 dönemi kapsamında test ettikleri çalışma sonucunda küresel finansal kriz ve Avrupa borç krizi döneminde ciddi bulaşma etkileri tespit etmişlerdir. Okorie ve Lin (2020), korana virüs enfekte olmuş 32 ülke özelinde finansal bulaşmanın etkilerini 1 Ekim 2019-31 Mart 2020 dönemi verileriyle inceledikleri çalışmada COVID-19 salgınının bir sonucu olarak borsalarda önemli ancak kısa süreli borsa getiri ve oynaklıklarında bir bulaşma etkisi olduğunu tespit etmişlerdir.

## **2. VERİ SETİ**

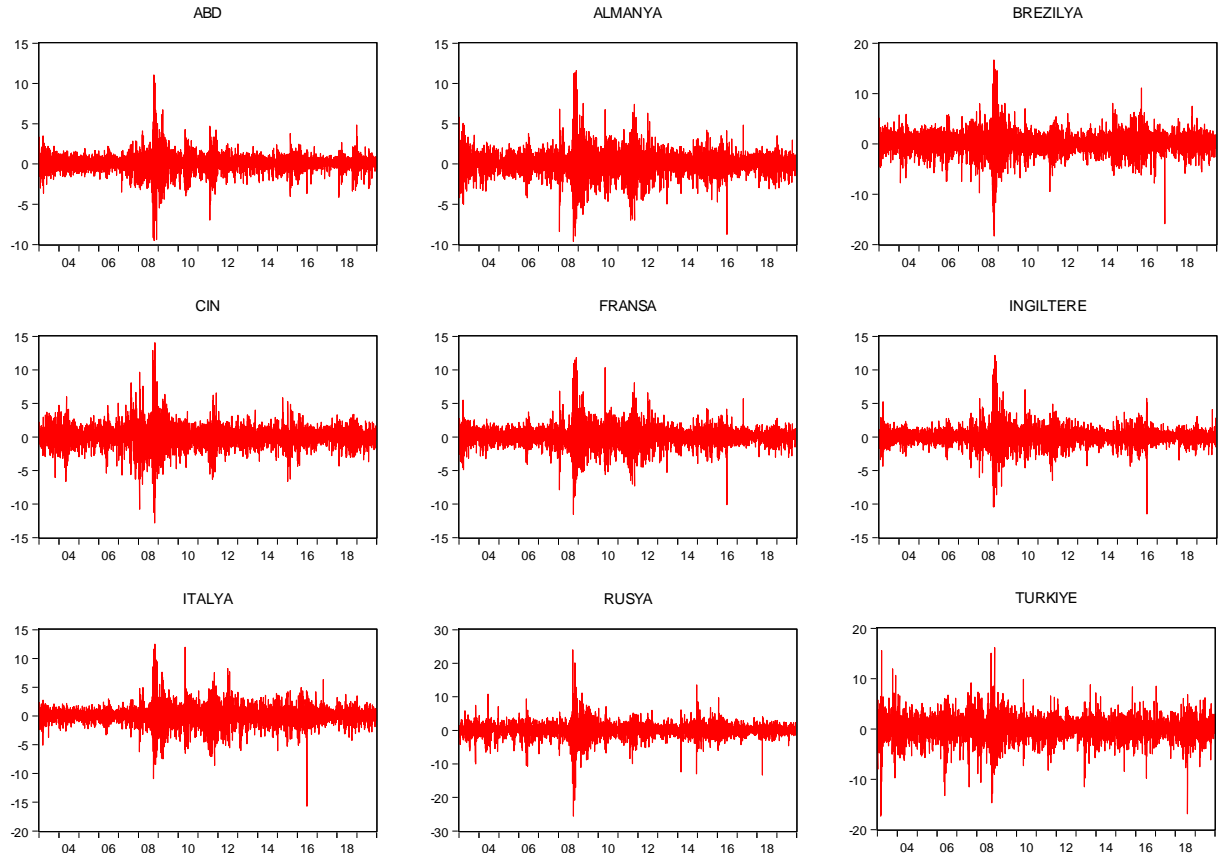
Çalışmada gelişmiş piyasalar (ABD, Fransa, Almanya, İtalya ve İngiltere) ve gelişmekte olan piyasalar (Brezilya, Rusya, Çin ve Türkiye) arasındaki finansal bulaşmanın etkileri 31 Aralık 2002-31 Aralık 2019 günlük verileri kullanılarak incelenmiştir.

Çalışmanın tüm örneklem dönemi olan 31 Aralık 2002- 31 Aralık 2019 dönemi 2007-2008 küresel finansal krizinin etkisi de göz önüne alınarak Çelik (2012)'in çalışmasını takiben 1 Ocak 2003-16 Temmuz 2007 kriz öncesi dönem; 17 Temmuz 2007-31 Ağustos 2009 kriz dönemi olmak üzere ikiye ayrılarak dinamik koşullu korelasyon (DCC-GARCH) modeli aracılığıyla analiz edilmiştir.

31 Aralık 2002-31 Aralık 2019 dönemi için söz konusu ülkelerin hisse senedi piyasası endekslerinin günlük kapanış fiyatları MSCI web sitesinden elde edilmiştir. Endeks serileri  $P_t = \ln(P_t/P_{t-1})$  dönüşümü ile logaritmik getiri serilerine dönüştürülmüştür.

Tüm örneklem dönemi boyunca ülke borsa endeks serilerinin logaritmik getiri formu Grafik 1'de verilmiştir.

**Grafik 1. Borsalara Ait Logaritmik Endeks Getirilerinin Zaman Yolu Grafiği**



Grafik 1 incelendiğinde ülke borsa endeks getirilerinin küresel finansal krizin yarattığı belirsizliğin etkisiyle 2008 yılının üçüncü çeyreğinde oynak bir yapı sergilediği görülmektedir.

Tüm örneklem dönemi, kriz öncesi dönem ve kriz dönemi tanımlayıcı istatistikleri ise sırasıyla tablo 1, tablo 2 ve tablo 3'te sunulmuştur.

**Tablo 1. Tüm Örneklem Dönemi (31 Aralık 2002-31 Aralık 2019) Tanımlayıcı İstatistikler**

	Ortalama	Min	Mak	S.Sapma	Çarpıklık	Basıklık	Jarque-Bera	ARCH (10)	ADF	PP
ABD	0,03	-9,51	11,04	1,11	-0,38	15,11	27196,60***	174,61***	-16,36***	-73,81***
Almanya	0,02	-9,64	11,59	1,48	-0,11	9,51	7833,34***	104,99***	-31,81***	-66,97***
Brezilya	0,04	-18,32	16,62	2,12	-0,35	10,68	10992,97***	168,89***	-13,14***	-63,10***
Çin	0,04	-12,84	14,04	1,63	-0,06	10,37	10043,13***	148,94***	-11,66***	-63,46***
Fransa	0,02	-11,57	11,84	1,47	-0,09	11,17	12348,29***	95,21***	-15,46***	-68,50***
İngiltere	0,01	-11,47	12,16	1,31	-0,26	14,39	24017,41***	130,54***	-11,30***	-68,44***
İtalya	0,00	-15,69	12,47	1,64	-0,26	10,53	10520,07***	75,05***	-14,48***	-67,91***
Rusya	0,02	-25,59	23,98	2,20	-0,48	19,18	48574,57***	71,32***	-10,75***	-61,45***
Türkiye	0,02	-17,34	16,16	2,32	-0,43	8,71	6151,39***	41,26***	-17,27***	-64,80***

Not: \*\*\*, %1 önem düzeyinde anlamlılığı ifade etmektedir.

Tablo 1, tüm örneklem dönemi için borsa endeks getiri serilerinin tanımlayıcı istatistiklerini göstermektedir. Tablo 1'deki sonuçlara göre, tüm örneklem dönemi için günlük ortalama getiri açısından Brezilya ve Çin borsa endeksinin en yüksek ortalama getiriyi sağladığı ve bunu ABD borsa endeks getirisini takip ettiği, İtalya borsa endeksinin ise en düşük ortalama getiriye sahip olduğu görülmektedir. Oynaklık açısından standart sapma değerlerine göre özellikle gelişmekte olan ülke borsa endeksleri sırayla Türkiye, Rusya, Brezilya borsa endekslerinin daha oynak bir yapı sergilediği görülmektedir. Endeks getiri serilerinin normal dağılım özelliği göstermediği, serilerde 10. gecikmede ARCH etkisi olduğu ve son olarak ADF ve PP birim kök test sonuçları tüm borsa endeks getiri serilerinin düzey seviyelerinde durağan olduğunu göstermektedir.

**Tablo 2. Kriz Öncesi Dönem (1 Ocak 2003-16 Temmuz 2007) Tanımlayıcı İstatistikler**

	Ortalama	Min	Maks.	S.Sapma	Çarpıklık	Basıklık	Jarque-Bera	ARCH (10)	ADF	PP
ABD	0,05	-3,60	3,48	0,77	-0,03	4,92	181,41***	16,94***	-14,95***	-37,49***
Almanya	0,10	-5,00	5,79	1,19	-0,16	5,10	222,56***	26,44***	-12,92***	-35,86***
Brezilya	0,18	-7,78	5,89	1,79	-0,50	4,43	149,36***	7,85***	-10,77***	-30,19***
Çin	0,13	-6,62	6,01	1,38	-0,31	5,19	255,14***	7,63***	-24,28***	-31,13***
Fransa	0,08	-4,86	5,46	1,03	-0,22	5,31	271,97***	26,25***	-15,78***	-35,46***
İngiltere	0,06	-4,36	5,26	0,88	-0,12	5,15	230,64***	16,96***	-17,10***	-37,08***
İtalya	0,07	-5,08	2,98	0,90	-0,42	4,46	139,83***	10,01***	-23,47***	-35,86***
Rusya	0,13	-10,62	10,81	1,93	-0,62	7,60	1117,38***	11,86***	-14,33***	-33,25***
Türkiye	0,15	-17,34	15,59	2,51	-0,66	9,54	2196,37***	23,94***	-10,61***	-34,71***

Not: \*\*\*, %1 önem düzeyinde anlamlılığı ifade etmektedir.

Tablo 2, kriz öncesi dönem için borsa endeks getiri serilerinin tanımlayıcı istatistiklerini göstermektedir. Tablo 2'deki sonuçlara göre, kriz öncesi dönem için ortalama getiri açısından gelişmekte olan ülke borsa endekslerinin (sırayla Brezilya, Türkiye, Rusya ve Çin) gelişmiş ülke borsa endekslerine (sırayla Almanya, Fransa, İtalya, İngiltere, ABD) nazaran daha iyi bir performans sergilediği görülmektedir. Gelişmekte olan ülke borsa endekslerinin bu performanslarına paralel olarak oynaklık açısından da standart sapma değerlerinin sırayla Türkiye, Rusya, Brezilya, Çin gelişmiş ülke borsa endekslerinden daha yüksek olduğu görülmektedir. Gelişmiş ülke borsaları içerisinde ilgili dönemde ABD, en düşük oynaklığa sahip borsa endeksi olmuştur ve bunu sırasıyla İngiltere, İtalya, Fransa ve Almanya takip etmiştir. Endeks getiri serilerinin normal dağılım özelliği göstermediği, serilerde 10. gecikmede ARCH etkisi olduğu ve son olarak ADF ve PP birim kök test sonuçları tüm borsa endeks getiri serilerinin düzey seviyelerinde durağan olduğunu göstermektedir.

**Tablo 3. Kriz Dönemi (17 Temmuz 2007-31 Ağustos 2009) Tanımlayıcı İstatistikler**

	Ortalama	Min	Mak.	S.Sapma	Çarpıklık	Basıklık	Jarque-Bera	ARCH (10)	ADF	PP
ABD	-0,07	-9,51	11,04	2,13	-0,11	7,52	473,39***	18,67***	-20,15***	-27,59***
Almanya	-0,09	-9,64	11,59	2,36	0,19	7,55	482,65***	13,28***	-10,56***	-23,89***
Brezilya	-0,02	-18,32	16,62	3,60	-0,25	7,48	468,96***	29,73***	-5,30***	-22,94***
Çin	-0,03	-12,84	14,04	3,04	0,10	5,59	155,70***	14,72***	-23,49***	-23,50***
Fransa	-0,08	-11,57	11,84	2,42	0,16	7,72	516,90***	12,86***	-8,05***	-24,94***
İngiltere	-0,10	-10,43	12,16	2,40	0,06	7,57	484,03***	17,21***	-9,20***	-24,69***
İtalya	-0,11	-10,89	12,47	2,45	0,18	7,39	448,80***	16,67***	-8,08***	-23,45***
Rusya	-0,13	-25,59	23,98	3,94	-0,28	12,04	1895,23***	7,63***	-5,44***	-20,90***
Türkiye	-0,06	-14,69	16,16	3,31	-0,05	5,69	167,39***	5,04***	-21,86***	-21,86***

Not: \*\*\*, %1 önem düzeyinde anlamlılığı ifade etmektedir.

Tablo 3, kriz dönemi için borsa endeks getiri serilerinin tanımlayıcı istatistiklerini göstermektedir. Tablo 3'deki sonuçlara göre, kriz dönemi için ortalama getiri beklenildiği üzere tüm borsa endeksleri için negatif olarak elde edilmiştir. Özellikle gelişmekte olan ülke borsaları açısından en düşük negatif getiri sırayla Rusya, Türkiye, Çin ve Brezilya için elde edilirken, gelişmiş ülkeler açısından en düşük negatif getiri sırayla İtalya, İngiltere, Fransa, Almanya ve ABD için elde edilmiştir. Rusya borsa endeksi en yüksek negatif getirinin yanı sıra oynaklık açısından da hem gelişmekte olan hem de gelişmiş piyasalar içerisinde en yüksek oynaklığa sahip borsa endeksi olarak tespit edilmiştir. Rusya'yı takiben gelişmekte olan borsa endeksleri sırayla Brezilya, Türkiye, Çin kriz döneminde daha oynak bir yapı sergilemiştir. Kriz dönemi için endeks getiri serilerinin normal

dağılım özelliği göstermediği, serilerde 10. gecikmede ARCH etkisi olduğu ve son olarak ADF ve PP birim kök test sonuçları tüm borsa endeks getiri serilerinin düzey seviyelerinde durağan olduğunu göstermektedir.

### 3. YÖNTEM

Bu çalışmada, küresel finansal krizin bulaşıcı etkilerini incelemek için Engle (2002) tarafından önerilen iki değişkenli Dinamik Koşullu Korelasyon (DCC) -GARCH modelini kullanılmıştır.

DCC-GARCH model hem stabil dönemlerde hem de kriz dönemlerinde varsa bulaşma etkilerini test etmek için zamanla değişen koşullu korelasyon katsayılarının değişen varyansı hesaba katarak standartlaştırılmış artıklar aracılığıyla elde edilmesini sağlaması yönüyle avantajlara sahiptir.

DCC-GARCH modeli iki aşamalı bir tahmin sürecinden oluşmaktadır. İlk aşamada, tek değişkenli GARCH modeli tahmin edilmektedir. İkinci aşamada dinamik koşullu korelasyonlar hesaplanmaktadır. İki değişkenli DCC-GARCH modeli aşağıdaki gibi uygulanabilmektedir:

$y_t \equiv [y_{1t} \ y_{2t}]'$  koşullu bir ortalama denklemdeki geçmiş gözlemleri içeren  $2 \times 1$  vektör olmak üzere koşullu ortalama denklemde VAR modelin indirgenmiş biçimi eşitlik 1'deki gibi gösterilebilir.

$$A(L)y_t = \varepsilon_t, \quad \varepsilon_t \sim \text{Student} - t(0, H_t) \quad t = 1, \dots, T \quad (1)$$

Eşitlik 1'de yer alan  $A(L)$  otoregresif katsayılar için bir matrisi göstermektedir.  $(L)$  gecikme operatörüdür ve  $\varepsilon_t = [\varepsilon_{1t}, \varepsilon_{2t}]$  eşitlik 2'de yer alan spesifikasyona sahip standartlaştırılmış artıkların vektörünü ifade etmektedir.

$$H_t \equiv D_t R_t D_t \quad (2)$$

Burada  $D_t = \text{diag}\{\sqrt{h_{it}}\}$ , GARCH (1,1) modelinden elde edilen zamanla değişen standart sapmaların diyagonal matrisini ifade etmektedir ve  $R_t \equiv \{\rho_{ij}\}_t$ ,  $ij = 1,2$  için standartlaştırılmış artıkların simetrik dinamik koşullu korelasyon katsayılarını göstermektedir.

$D_t$ , 'deki koşullu standart sapmalar, tek değişkenli GARCH (1,1) modelinden aşağıdaki gibi elde edilir:

$$h_{it} = \omega_i + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \beta_j h_{t-j} \quad (3)$$

Engle (2002), DCC  $(M, N)$  yapısının gösterimi eşitlik 4'te verilmiştir:

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1}, \quad (4)$$

Eşitlikte yer alan,

$$Q_t = (1 - \sum_{m=1}^M \alpha_m - \sum_{n=1}^N b_n) \bar{Q} + \sum_{m=1}^M \alpha_m (\varepsilon_{t-m} \varepsilon_{t-m}) + \sum_{n=1}^N b_n Q_{t-n} \quad (5)$$



Eşitlik (5) 'te yer alan  $\bar{Q}$ , standartlaştırılmış artıkların zamanla değişmeyen koşullu kovaryans matrisini göstermektedir.  $Q_t^*$ ,  $Q_t$ 'nin köşegen elemanlarının kareköküne sahip ters çevrilmiş köşegen matrisini ifade etmektedir. Zamanla değişen koşullu korelasyonlar,  $\rho_{12,t} = q_{12,t} / \sqrt{q_{11,t} q_{22,t}}$  olarak hesaplanmaktadır.

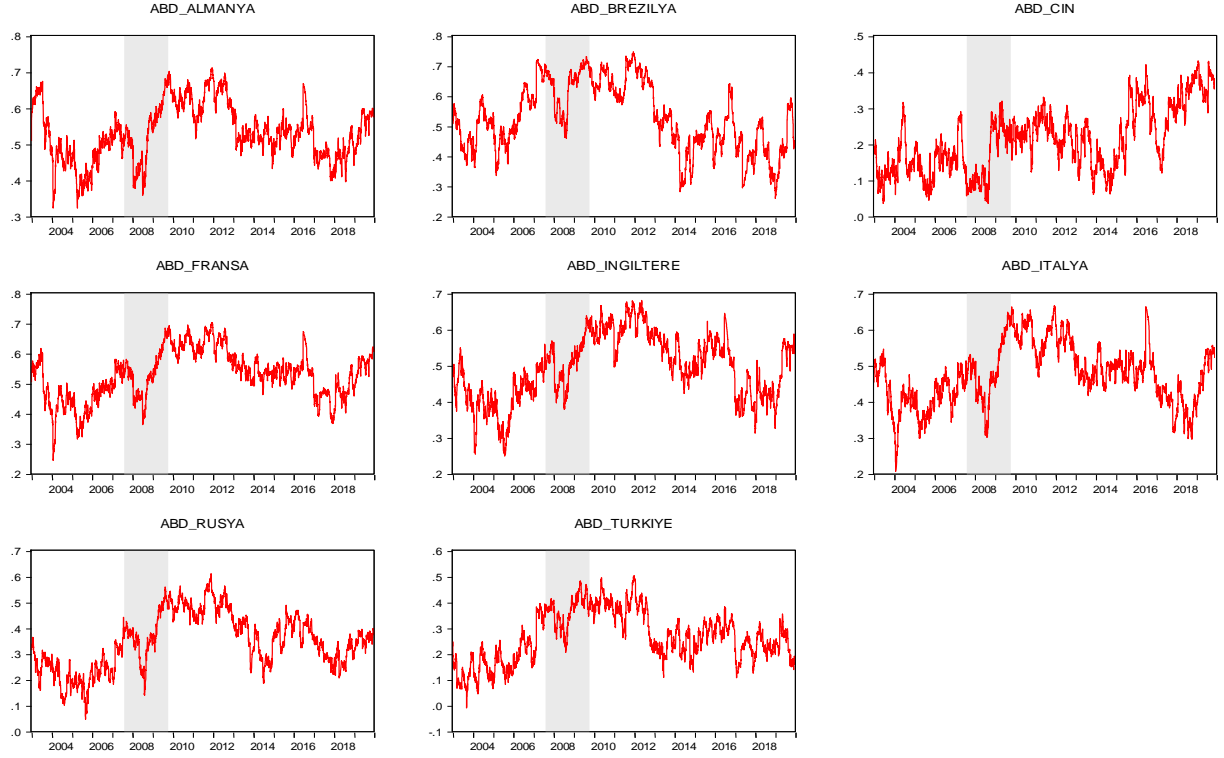
Kriz öncesi ve kriz dönemi için ABD ile diğer piyasalar arasındaki zamanla değişen korelasyonların tanımlayıcı istatistikleri ve grafikleri sırasıyla tablo 4 ve grafik 2’de verilmiştir.

**Tablo 4. Kriz Öncesi ve Kriz Dönemi İçin ABD Borsa Endeksi ve Diğer Ülke Borsa Endeksleri Arasındaki Dinamik Koşullu Korelasyonlar**

	Kriz Öncesi (1184 gün)				Kriz Dönemi (555 gün)				t-test
	Ortalama	Min.	Maks.	Std. Sap.	Ortalama	Min.	Maks.	Std. Sap.	
Almanya & ABD	0,471	0,310	0,629	0,069	0,565	0,347	0,663	0,040	-36,160***
Brezilya & ABD	0,527	0,361	0,706	0,074	0,711	0,530	0,803	0,037	-69,583***
Çin & ABD	0,118	0,015	0,270	0,049	0,186	0,039	0,343	0,049	-26,638***
Fransa & ABD	0,433	0,238	0,572	0,060	0,582	0,383	0,677	0,037	-63,310***
İngiltere & ABD	0,371	0,229	0,491	0,053	0,565	0,380	0,659	0,037	-89,246***
İtalya & ABD	0,380	0,193	0,505	0,054	0,544	0,327	0,643	0,041	-70,022***
Rusya & ABD	0,147	-0,001	0,284	0,049	0,420	0,169	0,554	0,045	-113,994***
Türkiye & ABD	0,136	-0,015	0,322	0,066	0,465	0,318	0,570	0,041	-127,146***
Grup Ortalaması	0,323				0,505				

**Not:** \*\*\*, %1 önem düzeyinde anlamlılığı ifade etmektedir.

**Grafik 2. ABD ile Diğer Piyasalar Arasındaki Zamanla Değişen Korelasyonlar**



**Not:** Gölgeli alan, kriz dönemini ifade etmektedir

Tablo 4'teki sonuçlar, kriz döneminde ABD ile diğer piyasalar arasındaki zamanla değişen korelasyon katsayılarının ortalamasının kriz öncesi döneme göre anlamlı bir şekilde yükseldiğini göstermektedir. Bu bulgu, ABD'den diğer piyasalara olan bulaşma etkisinin var olduğu hipotezini desteklemektedir. Gelişmiş ülkeler özelinde bulaşma etkisinin en fazla olduğu ülke borsaları sırasıyla İngiltere, İtalya, Fransa ve Almanya olarak gerçekleşmiştir. Gelişmekte olan piyasalarda bulaşmanın en fazla olduğu ülkeler ise sırasıyla Türkiye, Rusya, Brezilya ve Çin olarak gerçekleşmiştir.

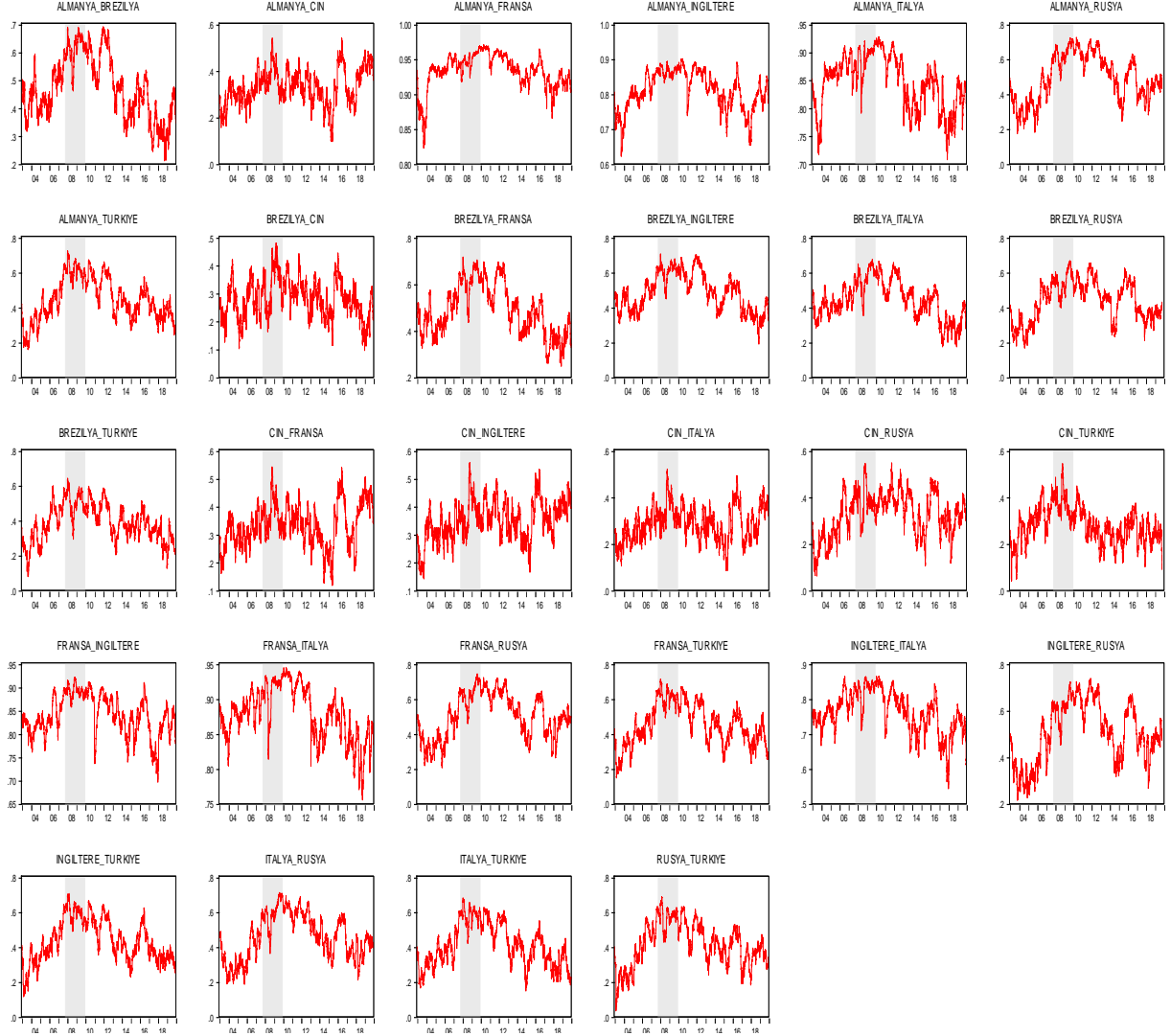
Diğer yandan ABD dışındaki piyasa çiftleri arasındaki dinamik korelasyon katsayıları da kriz öncesi ve kriz dönemi için karşılaştırılmış ve sonuçlar sırasıyla tablo 5 ve grafik 3'te sunulmuştur.

**Tablo 5. Kriz Öncesi ve Kriz Dönemi için ABD Borsa Endeksi Dışındaki Diğer Ülke Borsa Endeksleri Arasındaki Dinamik Koşullu Korelasyonlar**

	Kriz Öncesi (1184 gün)				Kriz Dönemi (555 gün)				t-test
	Ortalama	Min.	Maks.	Std. Sap.	Ortalama	Min.	Maks.	Std. Sap.	
Almanya & Brezilya	0,416	0,301	0,554	0,054	0,693	0,506	0,802	0,030	-135,817***
Almanya & Çin	0,266	0,147	0,412	0,050	0,386	0,245	0,560	0,047	-47,725***
Almanya & Fransa	0,919	0,834	0,952	0,028	0,960	0,858	0,977	0,010	-45,431***
Almanya & İngiltere	0,776	0,633	0,865	0,046	0,891	0,814	0,936	0,013	-79,281***
Almanya & İtalya	0,850	0,737	0,906	0,037	0,922	0,728	0,957	0,022	-50,583***
Almanya & Rusya	0,262	0,108	0,458	0,072	0,692	0,545	0,767	0,031	-174,873***
Almanya & Türkiye	0,322	0,149	0,489	0,083	0,695	0,544	0,819	0,033	-133,039***
Brezilya & Çin	0,207	0,066	0,368	0,058	0,382	0,227	0,540	0,050	-64,564***
Brezilya & Fransa	0,423	0,308	0,542	0,055	0,712	0,492	0,816	0,033	-136,014***
Brezilya & İngiltere	0,392	0,282	0,520	0,055	0,691	0,473	0,794	0,033	-140,915***
Brezilya & İtalya	0,381	0,255	0,508	0,053	0,663	0,492	0,782	0,039	-124,138***
Brezilya & Rusya	0,282	0,124	0,496	0,088	0,608	0,468	0,722	0,035	-110,812***
Brezilya & Türkiye	0,310	0,106	0,541	0,084	0,597	0,440	0,740	0,038	-98,400***
Çin & Fransa	0,268	0,143	0,394	0,047	0,393	0,264	0,607	0,048	-51,580***
Çin & İngiltere	0,262	0,130	0,391	0,057	0,406	0,257	0,627	0,047	-55,851***
Çin & İtalya	0,219	0,095	0,374	0,053	0,359	0,218	0,590	0,050	-53,135***
Çin & Rusya	0,227	0,059	0,447	0,081	0,382	0,171	0,629	0,053	-47,701***
Çin & Türkiye	0,286	0,092	0,434	0,064	0,404	0,284	0,632	0,048	-42,420***
Fransa & İngiltere	0,818	0,758	0,885	0,025	0,920	0,873	0,950	0,009	-124,139***
Fransa & İtalya	0,871	0,806	0,913	0,019	0,936	0,756	0,966	0,016	-74,257***
Fransa & Rusya	0,298	0,144	0,495	0,074	0,706	0,548	0,796	0,032	-160,760***
Fransa & Türkiye	0,343	0,126	0,496	0,083	0,700	0,544	0,813	0,034	-126,809***
İngiltere & İtalya	0,767	0,675	0,855	0,032	0,868	0,692	0,920	0,021	-78,604***
İngiltere & Rusya	0,284	0,155	0,483	0,076	0,677	0,525	0,797	0,033	-151,017***
İngiltere & Türkiye	0,323	0,094	0,491	0,087	0,698	0,578	0,814	0,031	-132,056***
İtalya & Rusya	0,249	0,112	0,461	0,076	0,673	0,458	0,786	0,039	-153,572***
İtalya & Türkiye	0,299	0,132	0,462	0,069	0,679	0,475	0,802	0,039	-147,460***
Rusya & Türkiye	0,303	0,034	0,524	0,107	0,649	0,425	0,781	0,037	-98,946***
Grup Ortalaması	0,415				0,655				

**Not:** \*\*\*, %1 önem düzeyinde anlamlılığı ifade etmektedir.

**Grafik 3. ABD Dışındaki Piyasa Çiftleri Arasındaki Dinamik Korelasyon Katsayıları**



**Not:** Gölge alan, kriz dönemini ifade etmektedir

Tablo 5'teki sonuçlar, kriz döneminde ABD dışındaki piyasa çiftleri arasında dinamik korelasyonların kriz öncesi döneme göre anlamlı bir şekilde yükseldiğini göstermektedir. Bu bulgu, piyasa çiftleri arasında bulaşma etkisinin var olduğu hipotezini desteklemektedir. Özellikle gelişmiş ve gelişmekte olan ülke borsa çiftleri arasındaki koşullu korelasyonlardaki artış, gelişmiş ülke borsa çiftleri arasındaki korelasyon artışından daha fazla olduğu görülmektedir. Dolayısıyla kriz aktarım mekanizmasının gelişmekte olan ülke borsaları üzerinde etkili olduğu söylenebilir.

#### **4. SONUÇ**

Bu çalışmada, ABD eşik-altı ipotekli konut piyasası (subprime) krizi sırasında gelişmiş ülke piyasaları (ABD, Fransa, Almanya, İtalya ve İngiltere) ve gelişmekte olan ülke piyasaları (Brezilya, Rusya, Çin ve Türkiye) arasında finansal bulaşmanın varlığı 31 Aralık 2002- 31 Aralık 2019 günlük verileri kullanılarak iki değişkenli Dinamik Koşullu Korelasyon (DCC)-GARCH modeli ile incelenmiştir.

Çalışma sonucunda, gelişmiş ve gelişmekte olan tüm ülke piyasa çiftleri arasında ABD küresel finansal krizi sırasında bulaşma olduğu yönünde bulgular elde edilmiştir. Gelişmiş ülkeler özelinde bulaşma etkisinin en fazla olduğu ülke borsaları sırasıyla İngiltere, İtalya, Fransa ve Almanya olarak gerçekleşmiştir. Gelişmekte olan piyasalarda bulaşmanın en fazla olduğu ülkeler ise sırasıyla Türkiye, Rusya, Brezilya ve Çin olarak gerçekleşmiştir. Diğer yandan piyasa çiftleri açısından finansal kriz döneminde gelişmiş ve gelişmekte olan ülke piyasaları arasındaki dinamik korelasyondaki artış ve daha fazla entegrasyon uluslararası çeşitlendirmenin yararlarını azaltıcı etkide bulunduğunu göstermektedir. Nitekim bu bulgu literatürde birçok çalışma tarafından da desteklenmektedir. Dolayısıyla, herhangi bir şok öncesi düşük korelasyonun sağladığı portföy getirisi, şokun etkisiyle ortadan kalkabileceğinden uluslararası yatırımcıların portföy çeşitliliği açısından piyasalar arasındaki dinamik koşullu korelasyonları dikkate alarak yatırımlarına yön vermeleri gerektiği söylenebilir.

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**FRANCE'S HEGEMONY OVER SENEGAL**

**Yawa Dieu-Donne Sehonou<sup>1</sup>**

<sup>1</sup>European University of Lefke, Cyprus, marcelinesehonou95@gmail.com, icoaef@gmail.com

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**ABSTRACT**

*This study discusses France's current influence or hegemony over Senegal. The relationship between these two countries commenced when France took over Gorée from the Dutch in 1677. This close relationship has continued even after Senegal got its independence on 4th April 1960. This paper aims at examining the extent to which France influences Senegal's socio-cultural and political life. it uses quantitative and qualitative analysis to ascertain France's hegemony over Senegal. France through its assimilation policy recognized Senegal as "an overseas French territory" and as such became the center of France's colonial policies. The study exposes briefly the concept of hegemony and does not neglect the policy assimilation in Senegal during the colonial period. Moreover, this study emphasizes the bilateral relations between both countries and is mainly dominated by France. Indeed, Senegalese institutions, laws, and constitution are inspired by France and are carbon-copies to that of the French. According to this study, Senegal's economy is dominated by French multinational companies which amass and plunder Senegal's natural resources. The FCFA is also another form of France domination and still in the heart of a deep and great debate today. Also, one aspect of France's hegemony over Senegal is its institute which is playing a crucial role. They are promoting France language and culture in Senegal. As a result, Senegal is independent but still dominated by its "old master France". At the end of this study, it would become very clear that France is losing its hegemony over Senegal due to the economic influences from the US and China.*

**Key Words:** *Hegemony, Colonialism, Bilateral, Relations*

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## **1. INTRODUCTION**

Just at the end of slavery in Africa, it has been witnessed of the great movement which is colonization and began at the end of the nineteenth century (19s). That is the case of Senegal which is a French colony.

The 1960 centuries have been a crucial period for, especially African countries. It was for almost their “Independence” regarding the settlers. But can we said that those countries are effectively independent if we turn our regards to their political, economic, and socio-cultural situation today? In fact, French colonies still in their master’s domination despite their freedom. This is the case of Senegal.

How this can be possible? In past for example and according to history, the colonial pact was established to exploit the natural resources of those colonies without paying too much.

So, what can we say today about this situation today? How France still dominate Senegal and take this country’s control? In order to provide answers to these questions, a succinct and logical analysis deserves to be done.

In the first part of our development, we will talk about the historical background between France and Senegal, the second part will concern the bilateral relations between France and Senegal then the conclusion at the end.

## **2. OVERVIEW OF THE HEGEMONY CONCEPT**

The concept of hegemony gained significant popularity with Antonio Gramsci with his book « Prison Notebooks. Hegemony as a word in international relations was first used by Robert Keohane. According to Mowle and Sacko (2007), the word is derived from a Greek word hegemony which means dominance or leadership. The concept doesn’t have a common definition and we can say that it’s the ability of a single State to spread its influence over the rest. This can be achieved by force (coercion) or by consent (a form of leadership).

In international relations hegemony refers to the ability of an actor (State often) with the overwhelming capability to shape the international system through military capabilities, economic and social-cultural means. The hegemon is the actor who uses its influence over the rest of the international actors. In this paper, the term refers to France's domination or control towards its old colony Senegal today.

### **3. FRANCE ASSIMILATION POLICY IN SENEGAL**

The legitimacy of France's assimilation policy started during the 19th and 20th centuries when France started its colonization in Africa. The purpose of this policy is to make Senegal still France subject and then they can have all control over the country. to making sure the plan, France achieve its target trough 2 ways: language and culture, According to Diouf M. (1998), the assimilation policy was meant to inculcate the French way of life into Africans.

Assimilation meant that if you adopted France culture and customs, you were a French citizen. The relative to this were the four communes of Senegal like Gorée, Dakar, Rufisque, and Saint-Louis. In fact, France selected some Senegalese Elites of those communes and transformed them into French citizens, and they had the right to participate in French affairs as normal citizens. As Elite we can mention Blaise Diagne (he was the first deputy in French Assembly and he defines original Senegalese as French citizens), Barthelémy Duran Valentin. The four communes were only French colonies that received French citizenship until 1944.

French assimilation was political, economic, and cultural. According to Tony Chafer (2013), politically, France helped Senegalese to form their government and policy, elaborate their rule and law, build their architecture all at the image of France. Economically, with the close of the colonial pact, Senegal sent its good materials to France; this combined with Senegal currency which is made by France enable France to maintain control of the currency and economy. By the policy of language through education, most Senegalese were eliminated in the political sphere and some of them couldn't get a public job. After the French assimilation policy and Senegal independence from France, both still maintain a good bilateral relation which is playing a great role in France's domination on Senegal today.

### **4. BILATERAL RELATIONS BETWEEN FRANCE AND SENEGAL**

The relationship between France and Senegal does not date from today. This relationship goes back to the 1300 centuries. At this period, France merchants traveled and trade among the Senegalese coast. They were doing import (iron, cloth, muskets to Senegal) and export (textiles, spice, ivory, slave) and France established a Trading post in Saint-Louis. According to Chafer T., (2003), France has been Senega's best trading partner for over a century. There are currently many French companies such as BNP Paribas, Orange S.A, Eramet, Necotrans, Shell, and Societe Generale operating in Senegal.

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During 1763, France lost Saint- Louis when it was doing war against Great Britain. In 1783, during the “American Revolutionary War”, France kept back again Saint-Louis as a result of the victory. France started to control the Senegal river and hinterland during the “Scramble for Africa”.

In 1895, Senegal became a part of the French West Africa Colony and during the first and second world wars, Senegalese soldiers under the pseudo of “Senegalese Tirailleurs” have participated to the war in the part of France. We should remember that Senegalese soldiers fought again in the side of France during the Battle of France and the Italian campaign under the Free France Government in exile led by Charles de Gaulle. After Paris liberation and at the end of World War I, Senegal became a part of the French Union in 1946. Since 1960 when Senegal took its independence from France, both developed some diplomatic relations, economic and maintain close political and cultural relations until today. France can dominate Senegal through such bilateral relations.

## **5. DIPLOMATIC AND POLITICAL RELATIONS**

Diplomatic and political relations between Senegal and France are closely linked. Several reciprocal visits were made by political leaders of the countries. We can see France embassy in Senegal and Senegal embassy in Paris, According to Chafer T., (2013), Senegal has a general consulate in Bordeaux, Marseille, Lyon, and consular in Le Havre. Senegal's constitution is like France constitution and every year an international seminar is held between the two countries. The most discussed subjects between both concern education, immigration, foreign policy security and defense, economy, cultural promotion, and sport. Through such seminars, France can maintain hegemony over Senegal.

## **6. ECONOMIC RELATIONS**

The economic relations between France and Senegal are very important. France is the first economic partner and investor in Senegal. Most of France companies are in Senegal and play a crucial role in the economy of Senegal and those companies gained through the benefits of privatization of formerly State-owned Senegalese companies.

Every company has its own particularity and assume its mission correctly. In term of the dominant companies, we can see as

Total: energy company offshore oversees Senegal natural gas exploitation

Bollore company: they oversee all forms of transport (maritime, air plan, and earthy) and they are controlling Senegal port.

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France telecom: in charge of Senegal communication, internet, and commercialization of all electronic materials

Eiffage: civil engineering company, build and operate a new toll motorway

Senegalese des Eaux: manage the water supply system and bring good water

Sukosim: Cement and aggregate producer

and many bank companies like SGBS and BICIS (International Bank of Commerce and Industry of Senegal) in addition, the most important thing is Senegal. This currency which is FCFA (Central African CFA Franc) is in the center of the debate. Indeed, this currency has been made by France for all its colony. In fact, France creates one central bank for that country which is using FCFA and this currency allows France to amass more than five hundred billion dollars per year and control all their economy. Actual is great debate is around this problem and most of the country wants to change this currency. Not only the rate of the currency is very low but, it profits only in France.

According to Aisha Balaraba Bawa (2013), there are more than 250 French firms operating in Senegal with about 100 being subsidiaries of firms in France. These firms produce goods and services in excess of 2 billion Euros every year and employ about 20% of the labor force in the formal sector. Altogether, these firms also produced 25% of Senegal's GDP in 2013.

## **7. SOCIO-CULTURAL RELATIONS**

France's dominance on Senegal cannot be achieved today without the socio-cultural aspect. For them, language and culture are very important and are the only way. To make sure this, many institutes are established for the promotion of the French language and culture. According to Aisha Balaraba Bawa, (2013), most Senegalese can speak the French language and France remains the first destination of many Senegalese students, In 2013, there were about 9,000 Senegalese students studying in France. We also have the following going on:

Francophonie: its target is to promote the French language especially through education and they according to many scholarships to Senegalese.

French Institute: this Institute promotes French culture. They organize many cultural activities at this issue every time.

Institute « Pasteur »: this institute concerns Scientific researchers trained in France.

## **8. THE RISING INFLUENCE OF CHINA AND THE US IN SENEGAL**

Unfortunately, recent events indicate that France's hegemony over Senegal is on the decline whiles China and the US continue to dominate in that country's economy. China's President Xi Jinping went on his first official tour of West Africa and stopped in Senegal. A DW news report on 21st July 2018 said the Chinese President, Xi Jinping visited Senegal to promote his "belt and road" initiative. Moreover, several bilateral agreements were signed between China and Senegal. China is currently the largest trade partner to Senegal as China has become Africa's largest trading partner.

Also, according to the US State Department report of 2019, the U.S. investment in Senegal has expanded since 2014, including investments in power generation, industry, and the offshore oil and gas sector. The report confirms that France is no more Senegal's best trading partner as the Senegalese government seeks to diversify its direct investment portfolio. The US and Senegal signed a bilateral agreement in 1983 which took effect in 1990. This has tremendously increased the volume of investments from the US to Senegal. Following from above, France is losing its long-held hegemony power over Senegal.

## **9. CONCLUSION**

France and Senegal maintain a good relationship after Senegal independence and through this relationship, France still maintains its dominance on Senegal. Today, this dominance is not by coercion but by soft power. As we have seen: their diplomats, multinational and socio-cultural are playing a great role. All Senegal's foreign exchange earnings are repatriated back to France and most of their population adopt French culture, French language and so. Many Senegalese students in France today do not like to come back to their country because they prefer France to their country. In the end, we can say that France dominance is not a myth but it is the sad reality and we can ask ourselves until when will this country be truly independent of the hands of its Colonial master? Despite the decline in France's control and influence on Senegal's socio-cultural and political life, it will take a long time for France's hegemony power over Senegal to completely be a thing of the past.

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**UNCERTAINTY AND CULTURE**

**Pantelis C. Kostis, Ph.D. <sup>(1)</sup>, Kyriaki I. Kafka, Ph.D. <sup>(2)</sup>**

<sup>1</sup> Department of Economics, National and Kapodistrian University of Athens, pkostis@econ.uoa.gr

<sup>2</sup> Department of Economics, National and Kapodistrian University of Athens, kkafka@econ.uoa.gr

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**ABSTRACT**

*Under high uncertainty levels cultural background may change in the short or the medium term. In this paper the effects of uncertainty on cultural behaviors are investigated. Using an unbalanced panel dataset comprised from 18 Eurozone countries for the time period from 2002 up to 2018, fixed-effects assessment method, different fixed terms between the examined economies, dummies per wave of the nine total data waves of the European Social Survey and country-specific clustered robust estimates of the standard errors, the main conclusions of the empirical analysis are the following: Uncertainty significantly affects the cultural background of the societies and leads to its change, after two years an uncertainty shock have occurred. The effects of uncertainty on specific cultural values reveals significant effects on all Schwartz's cultural values. However, the effect is the highest for the dipole "conservatism and autonomy" and the smallest for the dipole "mastery vs harmony".*

**Keywords:** *Uncertainty, Culture, Behaviors, Financial Crisis, Covid-19.*

**JEL Codes:** *D81, D91, Z10.*

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## **1. INTRODUCTION**

The change of cultural values over time is an issue that concerns, among other things, economic science as this change is responsible for the reform of the economic, political and social life of societies. Boyd and Richerson (2005) argue that cultural change should be considered an evolutionary process based on Darwin's theory, in which some cultural values become more common and others are lost.

The general observation about the change in cultural background is that it remains relatively stable over time "under normal conditions". This conclusion emerges simply if one considers that the cultural dimensions that shape the cultural background remain relatively constant over time (De Jong, 2009, Petrakis and Kostis, 2014). The cultural background often appears stable at any given time because cultural mutations occur gradually (Jones, 2006). Research (Johnston, 1996) shows that stereotypes are generally very resistant to change and redefinition. Individuals who have adopted specific cultural characteristics tend to retain them in the process of gathering information. Therefore, they do not show signs of change in existing stereotypes.

Thus, the fact that the cultural dimensions and consequently the cultural background remain stable "under normal conditions" leaves much room for reflection and control of these conditions. Eurozone has suffered much from the crisis and many of its members adopted adjustment programs, significantly changing the function of the economies and the general living conditions.

The aim of the present paper is to investigate the effects of uncertainty on cultural values change. The main hypothesis examined is whether conditions such as those related with the recent global financial crisis of 2008 have led to changes in behaviors and values and thus on the cultural background of the societies.

The main conclusions of the empirical analysis are the following: a) Uncertainty significantly affects the cultural background of the societies and leads to its change. b) The effects of uncertainty on culture start after two years an uncertainty shock have occurred. c) The effects of uncertainty on specific cultural values reveals significant effects on all Schwartz's cultural values. However, the effect is the highest for the dipole "conservatism and autonomy" and the smallest for the dipole "mastery vs harmony". d) When uncertainty is high, this leads to higher levels of hierarchy (authority, humbleness), self-direction (independent thought and action), stimulation (excitement, novelty and challenge in life), affective autonomy (pursuit of actively positive activities: pleasure, exciting life) and mastery (ambition and hard work, daring, independence, drive for success) which means their life's harmony is disrupted, at least two years later

The structure of the paper is as follows: In Section 2 a literature review is presented regarding the factors that may lead to cultural background change. Section 3 presents the data used in the empirical analysis, as well as the methodology employed. Then comes (Section 4) the presentation of the empirical results. Finally, there are presented the basic conclusions of the overall analysis.

## **2. LITERATURE REVIEW**

The factors that exogenously influence the creation and shaping of the cultural background of a society are related to specific conditions that prevail in that society. The most serious sources of external influence on the formation of the cultural background are considered to be the available resources, the climate and in general the geographical features (McClelland, 1961, Diamond, 1999, Tavassoli, 2009, Triandis, 2009, Petrakis, 2014). These are factors that do not change or change gradually over time. As these factors create the background for the formation of the cultural background of a society, any change they show affects the prevailing cultural background accordingly.

Globalization is also considered an important factor in changing the cultural values of societies. Two conflicting schools of thought regarding the impact of globalization emerge. The first school of thought is based on the theory of modernization (Inglehart and Baker, 2000) arguing that globalization contributes to the convergence of differences between cultural backgrounds, as political and social forces lead to a change in cultural values. The consequence of globalization is the creation of a network of cultural values (Hermans and Kempen, 1998). This grid is based on common features between different societies that interact with the local cultural background of the societies, ultimately leading to a cultural transformation with high coherence between cultural fields. The second school emphasizes the stability and "resilience" of traditional values to the economic and political changes that are taking place under globalization. DiMaggio (1994) argues that the resistance of traditional values to change stems from the fact that these values are independent of economic change.

The aging of the population is another cause of incremental changes in the cultural background in recent decades. While the greatest differences in personality occur in adolescence (Borghans, Duckworth, Heckman and Weel Bas ter, 2008), significant changes in personality characteristics appear -even to a lesser extent- later in life. As individuals grow older, they become more emotionally stable personalities (Roberts, Walton and Viechtbauer, 2006). At the same time, behavior associated with being open to new experiences is something that increases at younger ages and decreases at older populations (Roberts, Walton and Viechtbauer, 2006). As people get older, they tend to become more "myopic" in the sense that they appear more oriented in the present while they do not seem to be particularly interested in long term situations. In addition, older people are considered more politically active, forming the main bulk of the electorate and relying more on traditional and materialistic values.

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Besides, developments such as generational replacement, increased access to higher education, urbanization, increasing gender equality and increasing national diversity that have led to the shift of cultural values from materialistic to post-materialist, from the 1970s onwards (Norris and Inglehart, 2016, 2019). These developments have brought about - and are expected to bring about - also gradual changes in the cultural background.

The above changes in cultural background do not happen suddenly and so can be characterized as incremental. Significant but also sudden are the changes observed in the cultural background after an external shock. It is a fact that crises tend to "give birth" or accelerate cultural changes, which if accepted once, because of the crisis, tend to become permanent. Changes of this type can cause high stress in individuals (Eschbach, Parker and Stoeberl, 2001), affecting their psychological adaptation to new conditions and can be a strong shock to the context of cultural values that characterize the societies. In such cases, the result is a change in cultural background, which is usually much faster than the incremental change described above.

An example is the recent financial crisis of 2008, which has affected most economies worldwide. Economic developments significantly affect the cultural background of individuals. Thus, the economic crisis not only affects economies but also societies and more specifically their cultural background (Magee, Miller and Heaven, 2013). As a result of the global financial crisis, there were significant economic consequences for economic actors, which led to significant stress and psychological pressure (Eschbach, Parker and Stoeberl, 2001, Petrakis, 2011, Sargent-Cox, Butterworth and Anstey, 2011). Casanova (2018) focuses on political culture and values and examines whether it changed after the financial crisis of 2008 in those countries that adopted an adjustment program in Europe, noting that people's orientation towards politics and democracy got worse in those countries in relevance to rest European countries. Proponents of insecurity hypothesis argue that the economic stress, insecurity and austerity experienced by individuals as a result of the crisis have changed their cultural values and are responsible for the rise of the populist wave (Norris and Inglehart, 2019, Rodrik, 2019).

### **3. DATA AND METHODOLOGY**

To investigate the relationship between uncertainty and culture, an unbalanced panel dataset, for the Eurozone countries<sup>9</sup> for the period from 2002 to 2018, is used. The choice of the time period under consideration is determined by the availability of data regarding culture, based on the European Social Survey (ESS) waves that have been released during that period.

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<sup>9</sup> Malta is not included in the analysis, due to unavailable data regarding the cultural background.

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To examine the effects of uncertainty on cultural background, the following equation is estimated:

$$Culture_{it} = a_i + \beta Uncertainty_{it} + \lambda_t + u_{it}, \quad (1)$$

where  $i$  denotes the economies of the Eurozone ( $N_{\max} = 18$ ) and  $t$  is the ESS wave under analysis ( $T_{\max} = 9$ ). The dependent variable *Culture* is a vector of variables that represent the cultural background, *Uncertainty* is an index of economic uncertainty,  $a_i$  is a constant term that captures the country-specific fixed effects and which records the country-specific time-invariant heterogeneity and finally,  $\lambda_t$  is a set of dummies that control for specific effects per wave that are common to all economies under analysis.

The estimation of equation (1) is done through the two ways fixed effects analysis (FE), which allows the economy-specific heterogeneity using a different constant term per economy and can be estimated using the standard least squares method (OLS). In addition, time dummies for each wave are included in order to incorporate in the analysis time effects that are common to all countries in the sample. In addition, cluster - robust estimates of the standard errors were taken into account in order to control for the correlation and heteroskedasticity for each economy.

In order to construct the Economic Uncertainty Index, following our previous research work (Petrakis, Valsamis and Kostis, 2014, Kostis, 2020), daily data of high capitalization stock indices are used for the countries under analysis. Also, as a proxy for global uncertainty, an Index is calculated that expresses the Global Stock Market based on the daily prices of the largest stock markets (USA, Canada, Mexico, Brazil, Eurozone, United Kingdom, Japan, China – Hong Kong, India) as the weighted average based on the GDP of each economy (GDP at current prices) as derived from the IMF World Economic Outlook Database.

Table 1 presents the indices used for each country under analysis, as well as the major stock indices used to construct the global stock market index. This table also presents the descriptive statistics of those indices, after maintaining only the daily prices for which data were available for all countries. All data was obtained using Reuters Datastream.

**Table 1. Descriptive Statistics of Stock Market Indices**

<b>Index</b>	<b>Country</b>	<b>N</b>	<b>Med.</b>	<b>Avg.</b>	<b>St,Dev,</b>	<b>Min</b>	<b>Max</b>
AS51 Index	Austria	1045	4804,1	4705,0	1071,1	2744,0	6929,0
BEL20 Index	Belgium	1045	3000,9	3047,5	705,0	1527,3	4749,5
CYSMFTSE Index	Cyprus	1045	332,6	385,2	423,9	32,6	1864,8
TALSE Index	Estonia	1045	663,4	655,6	348,5	110,7	1316,3
HEX25 Index	Finland	1045	2450,1	2568,5	861,0	1106,1	4354,0
CAC Index	France	1045	4397,3	4444,6	926,9	2534,5	6813,7
DAX Index	Germany	1045	6851,7	7451,9	2891,9	2403,2	13483,3
FTASE Index	Greece	1045	8327,9	10064,8	8092,8	1194,1	29400,0
ISEQ Index	Ireland	1045	5459,2	5319,3	1716,3	1949,6	9963,4
FTSEMIB Index	Italy	1045	22652,9	25973,2	8768,2	12740,0	49355,0
RIGSE Index	Latvia	1045	423,5	487,9	258,7	106,9	1073,2
VILSE Index	Lithuania	1045	399,7	373,2	187,2	64,0	726,1
LUXXX Index	Luxembourg	1045	1421,8	1441,0	380,3	651,5	2578,2
MALTEX Index	Malta	1045	3524,9	3673,3	954,9	1755,5	6552,6
AEX Index	Netherlands	1045	422,6	430,0	107,7	199,5	695,2
PSI20 Index	Portugal	1045	6710,6	7270,3	2312,5	4362,1	14822,6
SBITOP Index	Slovenia	1045	824,4	940,8	428,5	501,3	2674,7
SKSM Index	Slovakia	1045	247,7	266,1	109,2	70,2	501,3
IBEX Index	Spain	1045	9600,4	9785,1	2003,3	5499,2	15823,7
SPX Index	USA	1045	1360,7	1578,0	590,3	683,4	3265,4
SPTSX60 Index	Canada	1045	708,0	695,5	176,1	330,4	1025,7
MEXBOL Index	Mexico	1045	31834,1	28833,8	15320,7	5087,9	51564,6
IBOV Index	Brazil	1045	51940,7	47842,5	24199,9	8715,9	117706,7
SX5E Index	Eurozone	1045	3156,5	3254,7	706,2	1817,2	5450,2
UKX Index	UK	1045	5951,4	5886,5	1018,1	3491,6	7778,8
NKY Index	Japan	1045	13774,5	14256,5	4432,0	7173,1	24120,0
HSI Index	China-Hong Kong	1045	20668,8	19681,8	5736,3	8409,0	33154,1
SENSEX Index	Bombay	1045	16859,7	16999,3	10697,3	2600,1	41681,5

Then, an Economic Uncertainty Index (UI) is created for each economy by calculating the rolling standard deviation of the previous 30 days of the returns of the main stock index of each economy. To isolate the shocks due to each economy, the monthly average of this index (standard deviation of 30 days) is regressed on its global counterpart and the residuals of each regression are marked as the uncertainty index for each economy. The monthly evolution of the residuals of each

regression is the monthly evolution of the uncertainty index of each country from 2001 to 2018. Next, these monthly UI data are converted into biennial data to be compatible with the culture values that get released in waves every two years by the ESS. The climate of uncertainty increases on dates of significant political and economic turmoil. Since the onset of the crisis, most Eurozone economies have been hit by a series of uncertainty shocks.

Regarding the cultural background, the ESS questions are used, which are presented in the second column of Table 2, which concern the way in which the cultural values of Schwartz (1992, 2006) are compiled. The percentage of those who answered "Very Much Like Me" was used in the sentences that appear in the second column. Based on Smith and Schwartz (1997) and Schwartz (2012) the following table is derived which relates human values to cultural values, based on specific questions that are realized in the waves of the ESS.

**Table 2. Linking Schwartz's Values to Relevant ESS Questions**

<b>Human Values</b>	<b>ESS questions</b>	<b>Cultural Values</b>
Self-direction	Important to think new ideas and being creative	Conservatism/ Embeddedness Vs Autonomy
Stimulation	Important to try new and different things in life Important to have a good time Important to seek adventures and have an exciting life Important to seek fun and things that give pleasure	Embeddedness
Hedonism	Important to understand different people	Intellectual Autonomy
Achievement	Important to show abilities and be admired Important to be successful and that people recognize achievements	Affective Autonomy
Power	Important to be rich, have money and expensive things Important to do what is told and follow rules	Hierarchy Vs Egalitarianism
Security	Important to live in secure and safe surroundings Important that government is strong and ensures safety	Hierarchy
Conformity	Important to behave properly	Egalitarianism
Tradition	Important to get respect from others Important to follow traditions and customs	Mastery Vs Harmony
Benevolence	Important that people are treated equally and have equal opportunities Important to help people and care for others well-being Important to be loyal to friends and devote to people close	Mastery
Universalism	Important to care for nature and environment	Harmony



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Table 3 presents the descriptive statistics for the ESS questions through which the Schwartz's cultural values are captured.

**Table 3. Descriptive Statistics of ESS Questions on Cultural Background**

		N	Med.	Avg	Stdev	Min	Max
<b>Conservatism/ Embeddedness Vs Autonomy</b>	Important to think new ideas and being creative	118	19,5	19,2	5,7	7,7	35,8
	Important to try new and different things in life	116	13,7	14,4	4,2	5,8	29,4
	Important to have a good time	118	12,5	13,9	6,5	3,3	31,5
	Important to seek adventures and have an exciting life	118	5,5	5,8	2,2	1,5	14,3
	Important seek fun and things that give pleasure	114	13,2	12,1	5,4	1,5	27,0
	Important to understand different people	117	19,6	19,7	6,5	4,8	32,7
	Important to show abilities and be admired	116	9,8	10,5	5,5	3,0	28,8
	Important to be successful and that people recognize achievements	114	8,7	9,7	4,8	3,8	29,4
<b>Hierarchy Vs Egalitarianism</b>	Important to be rich, have money and expensive things	116	2,2	3,1	2,3	0,4	12,2
	Important to do what is told and follow rules	116	9,2	9,5	3,5	3,6	21,3
	Important to live in secure and safe surroundings	116	24,0	25,5	11,5	3,6	63,7
	Important that government is strong and ensures safety	116	25,7	28,0	11,5	9,1	67,6
	Important to behave properly	116	15,2	17,1	6,7	6,7	33,4
<b>Mastery Vs Harmony</b>	Important to get respect from others	118	10,0	10,1	6,4	2,1	35,1
	Important follow traditions and customs	118	16,2	18,0	9,8	2,1	48,4
	Important that people are treated equally and have equal opportunities	113	32,3	33,6	9,8	14,9	57,6
	Important to help people and care for others well-being	116	25,1	25,0	8,7	8,7	48,8
	Important to be loyal to friends and devote to people close	120	35,5	33,6	10,0	10,5	52,4
	Important to care for nature and environment	116	31,4	31,4	8,0	13,2	54,6

Then, Principal Component Analyses (PCA) are realized in order to capture the cultural values dipoles “Conservatism / Embeddedness Vs Autonomy”, “Hierarchy Vs Egalitarianism”, and “Mastery Vs Harmony” based on the ESS questions that are related with each cultural value. Moreover, a PCA is performed for all ESS questions in order to capture a total measurement of cultural background.

#### **4. EMPIRICAL ANALYSIS AND DISCUSSION**

Table 4 presents a correlation matrix between the ESS questions. The questions used in the analysis present high correlation between each other, something that allows for using PCA in order to capture the overall culture measure and the Schwartz's cultural values.

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**Table 4. Correlation Matrix of the ESS Questions**

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18
Important to think new ideas and being creative	C1	1																	
Important to try new and different things in life	C2	0,74	1																
Important to have a good time	C3	0,44	0,52	1															
Important to seek adventures and have an exciting life	C4	0,58	0,67	0,25	1														
Important seek fun and things that give pleasure	C5	0,64	0,66	0,34	0,62	1													
Important to understand different people	C6	0,73	0,67	0,55	0,40	0,47	1												
Important to show abilities and be admired	C7	0,41	0,53	0,21	0,64	0,53	0,26	1											
Important to be successful and that people recognize achievements	C8	0,36	0,40	0,04	0,51	0,36	0,12	0,66	1										
Important to be rich, have money and expensive things	C9	0,20	0,14	-0,04	0,52	0,12	0,00	0,48	0,62	1									
Important to do what is told and follow rules	C10	0,35	0,42	-0,14	0,37	0,27	0,31	0,34	0,41	0,42	1								
Important to live in secure and safe surroundings	C11	0,46	0,42	0,14	0,47	0,36	0,41	0,50	0,54	0,44	0,49	1							
Important that government is strong and ensures safety	C12	0,46	0,46	0,07	0,59	0,41	0,44	0,68	0,65	0,53	0,47	0,67	1						
Important to behave properly	C13	0,59	0,72	0,41	0,61	0,55	0,65	0,66	0,39	0,29	0,49	0,59	0,76	1					
Important to get respect from others	C14	0,50	0,47	0,24	0,62	0,51	0,40	0,79	0,77	0,63	0,46	0,68	0,79	0,70	1				
Important follow traditions and customs	C15	0,47	0,40	-0,02	0,54	0,66	0,41	0,65	0,59	0,45	0,49	0,56	0,80	0,65	0,72	1			
Important that people are treated equally and have equal opportunities	C16	0,76	0,73	0,52	0,43	0,50	0,83	0,39	0,19	0,08	0,40	0,43	0,54	0,76	0,47	0,44	1		
Important to help people and care for others well-being	C17	0,74	0,61	0,31	0,48	0,58	0,82	0,42	0,29	0,05	0,35	0,46	0,58	0,69	0,50	0,58	0,78	1	

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Important to be loyal to friends and devote to people close	C18	0,60	0,44	0,60	0,26	0,38	0,82	0,21	0,03	-0,05	0,09	0,28	0,36	0,47	0,29	0,32	0,65	0,71	1
Important to care for nature and environment	C19	0,54	0,63	0,41	0,40	0,43	0,73	0,36	0,39	0,08	0,36	0,51	0,57	0,69	0,49	0,49	0,67	0,648	0,62

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Moreover, Table 5 presents the PCA for the “Conservatism/Embeddedness Vs Autonomy” cultural value.

**Table 5. PCA for Conservatism/Embeddedness Vs Autonomy**

	PC1	PC2
Important to think new ideas and being creative	<b>0,40</b>	-0,19
Important to try new and different things in life	<b>0,42</b>	-0,11
Important to have a good time	0,26	<b>-0,47</b>
Important to seek adventures and have an exciting life	0,38	0,23
Important to seek fun and things that give pleasure	0,38	0,04
Important to understand different people	0,34	<b>-0,44</b>
Important to show abilities and be admired	0,34	<b>0,43</b>
Important to be successful and that people recognize achievements	0,27	<b>0,55</b>
Eigenvalue	4,42	1,43
Var	55,28%	17,89%

**Note:** In bold are presented those values above 0.4 or below -0.4, since there are the ESS questions that more significantly shape the principal components.

The first two principal components are used. The first one has an eigenvalue of 4,42 and is related to 55,28% of total variance. It is positively configured by the following questions: “Important to think new ideas and being creative” and “Important to try new and different things in life”. In that way it is a component that is characterized by self-direction and stimulation.

The second one has an eigenvalue of 1,43 and is related to 17,89% of total variance. It is positively configured by the following questions: “Important to show abilities and be admired” and “Important to be successful and that people recognize achievements”. Moreover, it is configured negatively by “Important to have a good time” and “Important to understand different people”. In that way it is a component that is characterized by affective autonomy.

Table 6 presents the PCA for the “Hierarchy Vs Egalitarianism” cultural value.

**Table 6. PCA for Hierarchy Vs Egalitarianism**

	PC1	PC2
Important to be rich, have money and expensive things	0,37	<b>0,81</b>
Important to do what is told and follow rules	<b>0,41</b>	0,17
Important to live in secure and safe surroundings	<b>0,48</b>	-0,09
Important that government is strong and ensures safety	<b>0,51</b>	-0,15
Important to behave properly	<b>0,46</b>	<b>-0,53</b>

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Eigenvalue	3,07	0,76
Var	61,43%	15,40%

**Note:** In bold are presented those values above 0.4 or below -0.4, since there are the ESS questions that more significantly shape the principal components.

The first two principal components are used. The first one has an eigenvalue of 3.07 and is related to 61.43% of total variance. It is positively configured by the following questions: “Important to do what is told and follow rules”, “Important to live in secure and safe surroundings”, “Important that government is strong and ensures safety” and “Important to behave properly”. In that way it is a component that is characterized by power and security and thus hierarchy.

The second one has an eigenvalue of 0.76 and is related to 15.40% of total variance. It is positively configured by the question “Important to be rich, have money and expensive things” and negatively by “Important to behave properly”. In that way it is a component that is characterized by power and non-conformity and thus hierarchy as well.

Table 7 presents the PCA for the “Mastery Vs Harmony” cultural value.

**Table 7. PCA for Mastery Vs Harmony**

	PC1	PC2
Important to get respect from others	0,30	<b>0,62</b>
Important to follow traditions and customs	0,31	<b>0,60</b>
Important that people are treated equally and have equal opportunities	<b>0,41</b>	-0,15
Important to help people and care for others well-being	<b>0,42</b>	-0,08
Important to be loyal to friends and devote to people close	0,38	-0,38
Important to care for nature and environment	0,39	-0,03
Eigenvalue	4,57	1,15
Var	65,31%	16,49%

**Note:** In bold are presented those values above 0.4 or below -0.4, since there are the ESS questions that more significantly shape the principal components.

The first two principal components are used. The first one has an eigenvalue of 4.57 and is related to 65.31% of total variance. It is positively shaped by “Important that people are treated equally and have equal opportunities”, “Important to help people and care for others well-being” and “Important to understand different people”. In that way it is characterized by benevolence and thus mastery.

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The second one has an eigenvalue of 1.15 and is related to 16.49% of total variance. It is positively shaped by “Important to get respect from others” and “Important to follow traditions and customs”. In that way it is characterized by tradition and thus mastery as well.

Finally, Table 8 presents the PCA for overall culture. The first two principal components are used. The first one has an eigenvalue of 9.76 and is related to 51.39% of total variance. The second one has an eigenvalue of 3.02 and is related to 15.89% of total variance.

**Table 8. PCA for Overall Culture**

	PC1	PC2
Important to think new ideas and being creative	0,25	-0,16
Important to try new and different things in life	0,25	-0,13
Important to have a good time	0,14	-0,32
Important to seek adventures and have an exciting life	0,24	0,12
Important seek fun and things that give pleasure	0,23	-0,04
Important to understand different people	0,24	-0,32
Important to show abilities and be admired	0,23	0,22
Important to be successful and that people recognize achievements	0,19	0,34
Important to be rich, have money and expensive things	0,13	0,39
Important to do what is told and follow rules	0,17	0,18
Important to live in secure and safe surroundings	0,22	0,16
Important that government is strong and ensures safety	0,26	0,20
Important to behave properly	0,28	-0,02
Important to get respect from others	0,26	0,24
Important follow traditions and customs	0,24	0,19
Important that people are treated equally and have equal opportunities	0,26	-0,24
Important to help people and care for others well-being	0,26	-0,19
Important to be loyal to friends and devote to people close	0,19	-0,34
Important to care for nature and environment	0,24	-0,15
Eigenvalue	9,76	3,02
Var	51,39%	15,89%

Table 9 presents the estimation of equation (1). Each column represents a different estimation of equation 1 since different depended variables are used. The first eight columns represent the results when uncertainty is used as independent variable, and columns 9 to 18 represent the results when uncertainty with a lag is used as independent variable.

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Taking a look at regressions 1 to 8, no statistically significant effects of uncertainty on culture emerge. However, using a lag in uncertainty the results are completely different (regressions 9 to 16). All regressors are positive and statistically significant, at 1% level of statistical significance, except from the second principal component of the cultural value of hierarchy vs egalitarianism (regression 10). This means that when uncertainty is higher this leads to higher levels of hierarchy (authority humbleness), self-direction (independent thought and action) and stimulation (excitement, novelty and challenge in life), affective autonomy (pursuit of actively positive activities: pleasure, exciting life) and mastery (ambition and hard work, daring, independence, drive for success), at least two years later.

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**Table 9. Estimation of Equation (1) Using Different Independent Variables**

Dependent variable	Uncertainty without lag								Uncertainty with a lag							
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Hierarchy Vs Egalitarianism – PC1	0.000 (-0.00)								0.003*** (2.68)							
Hierarchy Vs Egalitarianism – PC2		0.000 (0.71)								-0,001 (-0.60)						
Conservatism/Embeddedness Vs Autonomy – PC1			-0.001 (-0.95)								0.004*** (2.82)					
Conservatism/Embeddedness Vs Autonomy – PC2				0.001 (0.67)								0.001*** (2.61)				
Mastery Vs Harmony – PC1					0.001 (0.07)								0.003*** (2.45)			
Mastery Vs Harmony – PC2						0.001 (0.70)								0.002*** (3.45)		
Overall Culture – PC1							-0.001 (-0.41)								0.007*** (3.00)	
Overall Culture – PC2								0.001 (1.00)								0.002** (1.93)
<b>N</b>	111	111	109	109	111	111	107	107	103	103	101	101	104	104	100	100
<b>R<sup>2</sup></b>	0.01%	15.99%	1.86%	2.80%	15.54%	2.40%	3.61%	19.21%	8,38%	12,14%	15.00%	8.70%	22.80%	14.19%	17.87%	18.03%
<b>F-stat</b>	0.08	8.66***	0.84	1.28	8.37***	1.12	1.63	10.34***	3.80**	5.73***	7.15***	3.86***	11.90***	6.95***	8.70***	8.80***

**Notes:** The t-statistics values are displayed in parentheses. \*, \*\* and \*\*\* represent statistical significance at 10%, 5% and 1% significance level, respectively. Each column represents a separate regression. All regressions have included the effect of the time variable (taking into account the effects common to countries in each wave), different constant terms (to take into account the effects on each economy separately) as well as corrections to standard errors (clustered robust standard errors).



## **5. CONCLUSIONS**

The analysis provided by the present paper concludes that there is significant effect of uncertainty on cultural values in the Eurozone countries during the period from 2002 up to 2018. This means that under conditions characterized by high level of uncertainty such as the global financial crisis of 2008 or the recent pandemic of Covid-19, the behaviors, the preferences and the in general the cultural background of the societies is about to change.

While cultural background is a slow-moving structure that usually is changed in an incremental way, when uncertainty shocks are present culture can change more suddenly. The empirical analysis provided by this paper revealed no effect of uncertainty within the first two years of presence of high uncertainty. However, after two years of an uncertainty shock all Schwartz's cultural values as well the overall culture significantly changed.

Besides, the empirical analysis concludes that when uncertainty is high this leads to higher levels of hierarchy (authority, humbleness), self-direction (independent thought and action), stimulation (excitement, novelty and challenge in life), affective autonomy (pursuit of actively positive activities: pleasure, exciting life) and mastery (ambition and hard work, daring, independence, drive for success) which means their life's harmony is disrupted, at least two years later.

In general, the cultural background has a long-term homocyclic effect in many Eurozone countries. In the economic prosperity phase, there are a number of "anti-growth" aspects of social values linked to lack of openness. However, in times of recession, this social model itself is giving rise to lines of defense linked to inward-looking while at the same time opposing its change. Thus, during the crisis, in-group collectivism (family) helps to reduce the negative effects of the crisis. However, the fact that in the very difficult phase of recession the cultural background works as a "life-saviour" gives it the chance to survive, possibly even stronger(!) in the development phase where it is now acting as an obstacle! This is what is called cultural anti-growth trap (Petrakis and Kostis, 2021).

These results may be critical for governments and policymakers that face increased uncertainty levels. The cultural background of the societies affects the effectiveness of economic policy, since a society has to approve firstly an economic policy in order to make it more effective (Kafka, 2020, Kafka, Kostis and Petrakis, 2020).

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**THE ANALYSIS OF RELATIONSHIP BETWEEN THE MONEY SUPPLY, BUDGET  
DEFICIT AND INFLATION IN TURKEY: 2009-2019**

**Asst. Prof. Dr. Musa BAYIR** <sup>(1)</sup>, **Res. Asst. Hüseyin GÜVENOĞLU** <sup>(2)</sup>

<sup>1</sup> Bandirma Onyedi Eylül University, Balıkesir, Turkey, musa.bayir@gmail.com, ORCID: 0000-0002-6877-4032

<sup>2</sup> Bandirma Onyedi Eylül University, Balıkesir, Turkey, hguvenoglu@bandirma.edu.tr, ORCID: 0000-0002-5220-3657

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**ABSTRACT**

*Money supply, budget deficit and inflation are among the most important macroeconomic dynamics of economies. In addition, inflation has significant costs on economies. When monetary and fiscal policies are not used in a compatible and supportive manner, this causes inflation. For this reason, it is very important to reveal the relationship between money supply, budget deficit and inflation variables. Therefore, this study aims to determine empirically the relationships between the money supply, budget deficits and inflation in the Turkish economy. Granger causality method is used in the study. The analysis include the 2009-2019 period. The analysis is performed with quarterly data. Analysis results showed that there is one-way causality from money supply and budget deficit to inflation. There is also a one-way causality relationship from money supply to budget deficit.*

**Keywords:** Money Supply, Budget Deficit, Inflation, Granger Causality Countries, Panel Data Analysis.

**JEL Codes:** H60, E51, E31, C32

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## **1. INTRODUCTION**

Money supply, budget deficit and inflation indicators are among the most important macroeconomic dynamics of economies. Because of this, they are closely concerned by the monetary and fiscal policies. In addition, it can be stated that the variables have important effects on each other. The monetary and fiscal policies which are applied in reaching the macroeconomic targets of the economies should be carried out in a healthy and coordinated manner. In other words, fiscal policies should not negatively affect monetary policy, both in terms of application and results, and monetary policy should not negatively affect fiscal policy. What is important here is the correct selection of the policies to be applied and a good analysis of the effects of the policies on the economy. Considering the practice, it is seen that the utilization of monetary policy instruments in a way that supports the expansionary fiscal policy, especially in developing countries, has a negative effect on price stability. This situation, causes high inflation initially and after that significant economic instability.

A term of chronic high inflation, public sector revenue-expenditure imbalances, fiscal dominance, significant structural breaks and economic crisis occurred in Turkey before 2001. In this term, one of the main reasons for the high inflation rates was the financing by printing money of the budget deficits resulting from the public sector income-expenditure imbalance. In addition during this term, firstly budget deficits continued and there wasn't any change in the financing method. Secondly, the increase in the money supply as a result of the printing of money reduced the interest rates in the market. This situation encouraged more consumption instead of saving. Thus, while price instabilities increased, inflation became chronic over time (Aamir, Yasir, Ullah and Ahmad, 2014: 40). Thus, public debt increased further and resources in financial markets have shifted from the private sector to the public. This situation, has deepened the fiscal dominance cases in Turkey's economy. Finally, public debt increased further and the 2001 economic crisis ensued in a high inflationary economic layout. 2001 economic crisis in Turkey's economy has been a turning point for the economic system as described above. Radical arrangements were made in many field during the economic structuring stage. Within the framework of the program called the transition to a strong economy, the independence of the central bank was legally guaranteed, the monetary policy strategy with inflation targeting was put into practice and the central bank's eventual goal was to provide and maintain price stability. Besides, important steps have been taken to decrease fiscal dominance and ensure fiscal discipline. The central bank is prohibited from financing the deficits of the treasury or other public institutions. In terms of fiscal policy, attention was paid to implementing a balanced budget while

structuring public borrowing. Thus, the inflation rate up to three-digit figures in Turkey's economy has fallen to single digits in the process.

When evaluated economically, the most important matter in choosing fiscal policy is that it produces faster and more effective results in the intervention to the economy (Elmendorf and Furman, 2008: 5-8). As a matter of fact during the 2008 financial crisis, in which the relative importance of price stability decreased, public expenditures were increased and fiscal incentive packages including tax reductions were put into effect in order to prevent negativities in production and employment levels and to increase economic performance (Karakurt, 2010: 186). In terms of Turkey, implemented expansionary fiscal policies have yielded pretty effective results. However, economic experience has shown that the long-term success of fiscal policy is closely related to the degree of application, time and type of financing. Therefore, the excessive, long-term and unplanned implementation of the expansionary fiscal policy will make the budget deficits permanent. On the other hand, the adoption of printing money in the financing of budget deficits, may have negative effects on price stability (Parlaktuna and Şimşek, 2007: 45). Another method used to finance budget deficits is borrowing. This method refers to the financing of budget deficits by issuing bonds and bills and borrowing from domestic or foreign sources (Bülbül, Ejder and Şahan, 2006: 102).

It is seen that the method of debt-financed budget deficits in Turkish economy. However, Sargent and Wallace (1981) defend that if budget deficits are financed through borrowing, inflationary effects may emerge. Accordingly, financing the budget deficits with the sale of treasury bonds will increase the wealth of individuals by increasing the bond interest rates. Increase in wealth will increase market demand and cause inflation. In this case, it is stated that the central bank will increase the money supply after a while in order to adjust the market interest rates or to ensure the sustainability of public debt (Saleh, 2003: 10). This causes price instabilities to become permanent.

With the 2008 global crisis, Central Bank of Turkey Republic (CBRT) implemented an expansionary monetary policy, depending on the increase in the global liquidity level. Accordingly, it has been observed that an expansionary monetary policy has been implemented in general. On the other hand, depending on the economic conditions, an expansionary fiscal policy has been applied in various periods. Currently, by 2019, an expansionary monetary and fiscal policy are implemented, taking into importance the global and local economic dynamics. However, inflation rates have increased significantly. When the said economic situation was evaluated, serious questions marks emerge regarding the effects of monetary policy and fiscal policy on inflation. In this context, this study aims to analyse empirically the relationships between the money supply, budget deficits and inflation in the Turkish economy in the aftermath of the 2008 financial crisis. In the next section of the

study, empirical literature is examined. In the third section, the data set, method and empirical findings are included, while the final section deals with the results and recommendations of the study.

## **2. LITERATURE REVIEW**

There is significant empirical literature on the relationship between the money supply, budget deficits and inflation in Turkey. Akçay, Alper and Özmucur (1996) analysed separately for the periods of 1948-1994 and 1987-1995. As a result of the analysis, while emphasizing the impartiality of money, it was found that budget deficits had an effect on inflation. On the other hand, Koru and Özmen (2003), based on the results of their analysis for the period 1983-1999, reached the findings that budget deficits and money supply had a positive but insignificant effect on inflation. In addition, they could not assign a direct relationship between budget deficits and inflation. Günaydın (2004) analysed for the period 1971-2002. The analysis results show that there is a relationship between budget deficits, inflation and money supply variables and that there is a causality relationship from money supply and budget deficits to inflation in the long run. Kesbiç, Baldemir, and Bakımlı (2005), in their analysis for the period 1989-2003, found that the money supply increased during the period when short-term advances were used to close the budget deficits and the increasing money supply increased inflation. Altıntaş, Çetintaş, and Taban (2008) stated in their analysis for the period 1992-2006, they reached findings that there is a positive and meaning relationship between inflation and money supply in both the long and short run, but there is not any relationship between the budget deficit and inflation in both the long and short run. Oktayer (2010) investigated between the period 1987-2009. It is found that budget deficits may have a direct impact on inflation in the long run. Özmen and Koçak (2012) found in their analysis for the period 1994-2011 that there was a meaningful relationship between money supply and inflation in the long run. However, they could not find a meaning relationship between budget deficit and inflation. Kaya and Öz (2016) researched the relationship between inflation, budget deficit and money supply using quarterly data for the period 1980-2014. As a result of the analysis, they found a statistically meaningful and positive relationship between inflation and money supply in long-term, but they could not find a statistically meaningful relationship between budget deficit and inflation.

There are empirical studies examining the relationship between budget deficit and inflation in the literature. Kırılcım (1998) examined for the period 1950-1987. It is reached that budget deficits had a important effect on inflation. Günaydın (2002) reached that two-way causality relationship between budget deficits and inflation for 1975-1998 years. Çetintaş (2005) analysed the relationship between budget deficits and inflation using data for the 1985-2003 period. As a result of the analysis, it has determined that there is a two-way causality relationship between budget deficits and inflation.



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Barişık and Kesikoğlu (2006) found that there is a two-way relationship between budget deficits and inflation for the period 1987-2003. Abdioğlu and Terzi (2009) found in their analysis for the period 1975-2005 that there was a negative relationship between inflation rate and budget deficits in the long-term. Bayrak and Kanca (2013), for the period 1980-2011, indicate that there is a relationship between budget deficits and inflation in the long-term, and there is also a one-way causality relationship from budget deficits to inflation. Doğru (2014) found in his analysis for the period 1978-2002 that there was a statistically meaning and positive relationship between budget deficit and inflation in the long run. Further, he found that there is a one-way one-way causality relationship from budget deficit to inflation in the short run. Öruç (2016) found in his analysis for the period 1950-2014 that the increase in budget deficits had an important effect on inflation. Alper (2018) researched the relationship between budget deficit and inflation using data for the period 1971-2016. As a result of the analysis, it was determined that the increase in budget deficits increased inflation. Maraş and Dumrul (2019) researched the relationship between budget deficits and inflation, using data from 2006-2018 in their study. As a result of the analysis, they found that there is a statistically meaningful and negative relationship between budget balance and inflation. Dağ and Kızılkaya (2019) investigated the relationship between inflation and budget deficit for the period 1960-2016. As a result of the analysis, they determined that the increase in inflation increased the budget deficit.

### **3. DATA SET**

This study analysed the relationship between the money supply, budget deficit and inflation in the Turkey economy. The analysis of the study was carried out using quarterly data to cover the period 2009-2019. Shortening information and data sources for the variables are indicate in Table 1.

**Table 1. Summary Information for Variables**

<b>Variables and Symbol</b>	<b>Defining Variable</b>	<b>Data Source</b>
Money Supply (MS)	M2 (Money in Circulation + Term Deposits + Demand Deposits)	CBRT
Budget Deficit (BD)	Public Expenditures-Public Revenues	CBRT
Inflation (INF)	Consumer Price Index Based on 2003 Prices	CBRT

In the study, M2 was selected as a money variable, which is among the money supply definitions of the CBRT. Budget deficit series was created by taking the difference between the expenditures and revenues of the central government budget as the budget deficit variable. Consumer price index based on 2003 was selected as the inflation variable. The data regarding the variables used

in the study were obtained from the electronic data distribution system of the CBRT. Before the econometric analysis, seasonal adjustment was performed using the CensusX12 method, since the budget deficit and inflation variables have seasonality characteristics.

#### 4. METHODOLOGY

In the study, the relationship between the money supply, budget deficit and inflation were analysed in Turkey by using Granger (1969) causality test. In the Granger causality test, dependent and independent variables are grouped separately and analysed simultaneously. In this test, firstly, equations (1), (2) and (3) are estimated with the appropriate lag length. Then, the significance of the lagged values of the independent variable is tested (Granger, 1969: 424-438).

$$MS_t = \sum_{l=1}^n \theta_l MS_{t-l} + \sum_{i=1}^n \theta_i BD_{t-i} + \sum_{k=1}^n \rho_k \Delta INF_{t-k} + u_{2t} \quad (1)$$

$$BD_t = \sum_{l=1}^n \gamma_l MS_{t-l} + \sum_{i=1}^n \beta_i BD_{t-i} + \sum_{k=1}^n \alpha_k \Delta INF_{t-k} + u_{1t} \quad (2)$$

$$INF_t = \sum_{l=1}^n \delta_l MS_{t-l} + \sum_{i=1}^n \varphi_i BD_{t-i} + \sum_{k=1}^n \omega_k \Delta INF_{t-k} + u_{3t} \quad (3)$$

In the study, firstly, the stationarity analysis was performed on the series. It is possible to make effective and consistent analyzes in time series analysis by making the relevant series stationary. In this direction, the stationarity test of the variables was performed with the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root tests, which are most commonly used in the literature, and the results obtained are indicated in Table 2. According to Table 2, the stationary state of the series was evaluated by considering both ADF and PP tests together. When the first differences are taken all series are not stationary in level. It is seen that all variables become stable at 1% significance level.

**Table 2. ADF and PP Unit Root Tests Results**

ADF - t statistics				
Variables	Level		First Difference	
	Constant	Constant+Trend	Constant	Constant+Trend
MS	(4,9842) [1,0000]	(1,8440) [1,000]	(1,7129) [0,9995]	(-8,1775) [0,0000]*
BD	(-2,5009) [0,1221]	(-5,0070) [0,0011]*	(-10,138) [0,0000]*	(-10,154) [0,0000]*
INF	(6,0418) [1,0000]	(1,6914) [1,0000]	(-3,0701) [0,0366]**	(-4,4681) [0,0049]*
PP - t statistics				
Variables	Level		First Difference	
	Constant	Constant+Trend	Constant	Constant+Trend
MS	(10,7655) [1,000]	(3,8347) [1,0000]	(-5,9216) [0,0000]*	(-8,5042) [0,0000]*
BD	(-2,4522) [0,1341]	(-5,0070) [0,0011]*	(-17,039) [0,0000]*	(-27,878) [0,0000]*
INF	(5,2785) [1,0000]	(1,3403) [1,0000]	(-2,9647) [0,0466]**	(-4,4691) [0,0048]*

**Note:** \* and \*\* indicate the stability of the variable at the 1% and 5% level, respectively. The lag length for the ADF unit root test were selected according to the Schwarz Information Criteria, and the d lag length for the PP unit root test were selected according to the Newey-West Information Criteria.

The optimum lag lengths are determined before estimating the equations (1), (2) and (3), in which all variables are considered internal, with the VAR method. For this; Criteria such as Likelihood Ratio Test (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criteria (SIC) and Hannan-Quinn Information Criteria (HQ) were used. Optimum lag length was determined as three after considering these criteria and credibility test results.

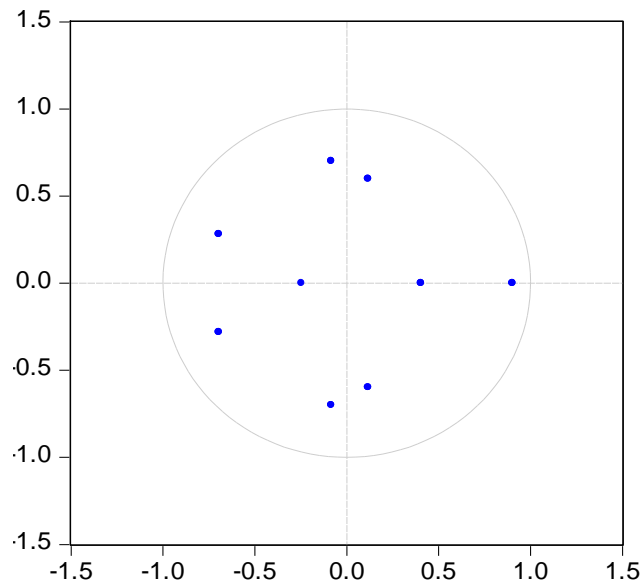
Various reliability tests have been performed related to the estimated VAR model at the specified lag length. First, the LM test was conducted to research whether there is an autocorrelation problem in the model and the test results are shown in Table 3. In the model with lag length determined as 3, there is no autocorrelation problem at the 5% significance level.

**Table 3. Autocorrelation LM Test Results**

<b>Lag Length</b>	<b>LM Statistics</b>	<b>Probability</b>
1	15,90793	0,0695
2	10,33189	0,3255
<b>3</b>	<b>14,53208</b>	<b>0,1054</b>
4	5,374501	0,8011

After determining whether there is an autocorrelation problem in the model, the reverse roots of the AR characteristic polynomial were researched in order to determine whether the VAR model exhibits a static structure or not. Results are shown in figure 1. When Figure 1 is investigated, it is seen that the inverse roots of the AR characteristic polynomial are located in the unit circle. Within the framework of these results, it is possible to say that the model has a stable structure.

**Figure 1. Reverse Roots of the AR Characteristic Polynomial**



Thirdly, in the VAR model estimation, whether the error terms have a normal distribution or not was investigated using the Jarque-Bera normality test. Jarque-Bera normality test results regarding the predictions are shown in table 4. According to the results of Jarque-Bera normality test, the probability value was found to be greater than 5%. In this case, it was decided that the error terms in the estimates for the 5% significance level had a normal distribution.

**Table 4. Jarque-Bera Normality Test Results**

	<b>Statistics</b>	<b>Probability</b>
Joint	7.209803	0.30

Finally, the variance problem is investigated by using the White test. White test results are shown in table 5. According to the results of the White test, the probability value of the model with a chi-square value of 123 was found to be greater than 5%. In this case, it was determined that there was not variance problem in the estimates at the 5% significance level.

**Table 5. White Test Results**

<b>Chi-square</b>	<b>Degree of Freedom</b>	<b>Probability</b>
123	108	0,15

After it was determined that there was not statistical problem in the estimates Granger causality test was performed. Granger causality test results are shown in table 6. When table 6 is analysed, it is concluded that there is a one-way causality relationship from money supply and budget deficit to inflation. In addition, a one-way causality relationship from money supply to budget deficit has been identified.

**Table 6. Granger Causality Test Results**

Hypothesis	F- Statistics	Probability
BD does not Granger cause MS	1,33334	0,2802
MS does not Granger cause BD	2,65151	0,0649***
INF does not Granger cause MS	1,26510	0,3023
MS does not Granger cause INF	9,83809	9,E-05*
INF does not Granger cause BD	0,29505	0,8287
BD does not Granger cause INF	2,76312	0,0575***

**Note:** \* and \*\*\* symbols indicate that the variable is significant at 1% and 10% levels respectively.

## 5. CONCLUSION

High level of budget deficit has been experienced in Turkish economy in second half of the 1980s up to the 2001 crisis. The resources of the central bank were used to finance these deficits. This situation caused high inflation. After the 2001 economic crisis, some legal arrangements were made to prevent this economic cycle. After the 2008 global economic crisis, an expansionary fiscal and monetary policy was implemented as a result of both the reflection of global conditions and the local economic situation. In an economic situation in which this policy design is maintained, relatively high inflation rates have been encountered since 2018-2019. With the COVID-19 epidemic that emerged in March 2020, the size of the economic policies that implemented in order to prevent possible economic negativities has reached larger amount. Under these economic conditions, revealing the relationship between money supply, budget deficits and inflation will provide important clues for policy makers.

Accordingly, this study, aims to determine empirically the relationships between the money supply, budget deficits and inflation in the Turkish economy the period 2009-2019. Granger causality test was used as the analysis method. Analysis results showed that there is one-way causality from money supply and budget deficit to inflation. Additionally, there is also a one-way causality relationship from money supply to budget deficit. Based on these results, firstly it is possible to say that the money supply affects the budget deficit. After the 2001 economic crisis, the central bank was prohibited from directly financing public expenditures. However, the public continued to indirectly finance its expenditures through borrowing. When evaluated together with the first result, the increase in the money supply of the central bank has an effect on both budget deficits and inflation. This situation may cause a significant deviation in price stability, which is the main target of the central bank. Finally, the conclusion that the money supply has an effect on inflation is in line with our expectations, given that the central bank's ultimate goal is price stability.

The findings of the study regarding the relationship between money supply-budget deficit and budget deficit-inflation show that the firstly applied expansionary fiscal policy will have detrimental

effects on price stability. Therefore, policy makers need to be careful. In the second stage, one of the most appropriate ways to close budget deficits is to increase tax revenues. However, the increase in tax revenues is not achieved solely by tax increases. In this context, it is important to apply optimum tax rates. The results of the study offer qualitatively important clues. However, it will be useful to use empirical methods that will obtain more quantitative and clear results.

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**OPERATIONAL EXCELLENCE DIMENSIONS IN THE OIL AND GAS SECTOR: A  
LITERATURE REVIEW**

**Muazu Hassan Muazu (<sup>1</sup>), Rosmaini Tasmin (<sup>2</sup>), Salisu Bashir Gwangwazo (<sup>3</sup>)**

<sup>1</sup> Dangote Business School, Bayero University Kano – Nigeria, [muazumuazu@gmail.com](mailto:muazumuazu@gmail.com).

<sup>2</sup> Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, [rosmaini@uthm.edu.my](mailto:rosmaini@uthm.edu.my)

<sup>3</sup> Academic Programmes Department, National Commission for Colleges of Education (NCCE), Nigeria, [salisugwangwazo@gmail.com](mailto:salisugwangwazo@gmail.com)

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**ABSTRACT**

*Operational excellence in the oil and gas sector has unique dimensions. This paper aims to review literature to elaborate on the dimensions and served as the continuation of the previous review that distinguished between manufacturing, services and oil and gas sectors dimensions of operational excellence. Journal articles, reports, professional papers, term papers and dissertations were reviewed. The paper found that operational efficiency, health and safety, assets and process reliability, and environmental performance are the dimensions of operational excellence in the oil and gas sector. Certain factors that could influence the dimensions were suggested. The paper contributed to literature and measurement of the constructs and consolidated on earlier review of the difference of the concept of operational excellence among different sectors. However, the paper's limitation lies in its inability to develop a framework showing the identified factors and how they relate to operational excellence in the oil and gas sector.*

**Keywords:** *Operational Excellence, Operational Efficiency, Health and Safety, Environment, Reliability.*

**JEL Codes:** *M11, M10*

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## **1. INTRODUCTION**

The global oil and gas industry had witnessed the transformation and related challenges due to the dynamism of the current economic environment. Operational excellence (OpEx) had been a widely accepted strategy in the oil and gas industry for its effect on firms' performance improvement (Shaw & Donovan, 2019). The contribution of OpEx in the transformation of oil and gas operation is enormous. Firms have registered drop in the cost of production, drop in emissions and waste, reduction in safety incidents and a number of a casualty had diminished (Ernst & Young, 2015).

OpEx has been well-thought-out as a cohesive management system that drives business productivity by maintaining proven practices and procedures of organisational activities. OpEx is the perspective of administrative management that underscores on the use of a variety of principles and systems, which is focussed towards the sustainable improvement of key performance metrics (Dahlgaard-Park, Reyes & Chen, 2018). Substantially, this basis was based on earlier development in the continuous improvement philosophies, such as Lean Manufacturing and Scientific Management. Antony, Escamilla and Caine (2003) postulated that the impetus of OpEx goes beyond the typical activity-based model of operational improvement; instead, it is of a complex model that also deals with risks.

Several scholars maintained that assessment of excellence is the process of determining organisational performance concerning a chosen model for continuous improvement for measuring expected outcome, achievement of result and what require improvement (Hillman, 1994). Excellence, as put by the European Foundation for Quality Management EFQM (1999), is that outstanding practice displayed by firms in managing the organisation and achieving results concerning certain notions. Practices, such as management by the process, result orientation, people development and involvement, customer focus, continuous learning, leadership and stability of purpose, innovation, partnership development, improvement, and public responsibility are what excellence is all about (EFQM, 1999).

Again OpEx is regarded as a sensation that has gone beyond quality improvement and cost reduction alone, to efficient resource management, including assets, people and their safety (Ernst & Young, 2015; Van Assen, 2012; Duggan, 2009). OpEx is viewed as a systematic management of safety, environment, health, reliability, and efficiency (SEHRE) while accomplishing a standard that is world-class in nature (Parker, 1999). Continuous improvement philosophy, employees' empowerment and ownership are critical for achieving OpEx (Fok-Yew and Ahmad, 2014a; Duggan, 2009). Thus, OpEx is a wide-ranging approach for boosting everyday operations in organisations. According to

Ciptono, Ibrahim and Sulaiman (2010), in oil and gas industries there should be critical consideration of employees' safety, security, health and environmental protection, which requires business continuity strategies and operational integrity.

Although OpEx may be viewed as a strategy in its entirety, there are variations as to what it stands for in different industries. What it may portray and targeted at achieving in a particular sector, say manufacturing, retail, education, tourism, services or oil and gas might not necessarily be the same. Literature had shown clearly some of the divergent views and dimensions of OpEx, as presented in an earlier article published by the current authors titled "operational excellence in the manufacturing, services and the oil and gas: the sectorial definitional constructs and risk management implication" in 2017. The focused of the paper was on manufacturing, services and the oil and gas sector, where a table was developed that summarised the divergence and convergence of what OpEx dimensions are among the industries as shown in Table 1 below.

Considering the development in the concerns for clarifying the dimensions of OpEx in different sectors, this paper is aimed at consolidating the work of Muazu and Tasmin (2017) and elaborating the dimensions of OpEx in the oil and gas sector. It was done with a view to strengthening literature on OpEx for research purposes that shows clearly how the concept was measured and what constructs are essential for the measurement.

## **2. MATERIAL AND METHOD**

In this review article, earlier work on OpEx across industries (manufacturing, service and the oil and gas) was reviewed and some elements and tables were recapped to show a continuation or a consolidation to works already done. Several journal articles and professional reports were reviewed and reported. Some texts and conference papers were also used as material for sourcing information for the current article. Practical company reports and real life experience were also gathered and synthesized to give deeper understanding on the various dimensions of OpEx in the oil and gas sector. Tables and charts were adapted and adopted to explain certain scenarios of OpEx individual dimensions in the oil and gas sector. Several search engines were explored for accessing the materials used in the current review, such as Google, research gate, Scopus, and Wiley online. Some of the keywords used for the search included operational excellence, operational efficiency, reliability, health and safety, environmental performance, oil and gas, dimensions, and constructs. Others were evolution, challenges, risk management, assets and machinery maintenance, supply chain management and lean strategy.

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A small sample was drawn from some oil firms in Nigeria randomly and data was collected from 50 management staff across engineering and maintenance, health and safety, productions and operations departments. An exploratory factor analysis was conducted on the measurement constructs of the OpEx dimensions in the oil and gas sector. Several iterations were conducted to stream out irrelevant measurement constructs regarded as free standing, cross-loading as well as those items with less than 0.50 coefficients of the rotated matrix.

### **3. DIMENSIONS OF OPERATIONAL EXCELLENCE IN THE OIL AND GAS**

A dimension is a basis to which a concept or variable is defined and measured. It is the direction of how a concept is looked upon and operationalised in a study. In view of the above definitions based on industry, the dimensions of operational excellence are increased in productivity, cost reduction, flexibility, lead time optimisation and efficiency (Soliman, 2017; Fok-Yew & Ahmad, 2014; Kandasamy, 2016; McCreery *et al.*, 2013). However, due to the peculiarity of the oil and gas operations, OpEx in the sector emphasises on safety and health, reliability, efficiency, downtime minimization, risk management and the concern for the environment (Parker, 1999; Wilson, 2012; McCreery *et al.*, 2013; Feblowitz, 2015; Mitchell, 2015; Chevron, 2010; Nolan & Anderson; Ernst & Young, 2015; Heath *et al.*, 2017; Edgame, 2014; Deloitte, 2015; Bellm, 2015; QEHS, 2017). In a similar notion, Elsevier (2016) maintained that achieving OpEx in the downstream sector has gone beyond skyrocketing profit margins to operational efficiency, reliability, safety and health, and environmental performance. This paper, therefore, elaborated the few dimensions of OpEx in the oil and gas sector with an emphasis on safety and health, reliability, operational efficiency and the environment. This paper is rather an extension of the current authors' previous work on OpEx dimensions in the oil and gas sector.

The previous review on the dimensions of OpEx among industries- manufacturing, service and oil and gas was conducted in 2017. It was found that there were similarities as well as differences in what OpEx stood for and the dimensions among the three industries. In Table 1, as developed by Muazu and Tasmin (2017), which showed the divergence and convergence of OpEx among manufacturing, service, and oil and gas industries.

**Table 1: Convergence and Divergence of OpEx Dimensions among Industries**

Muazu and Tasmin (2017)

Convergence	Divergence		
	Manufacturing	Service	Oil and Gas
Continuous improvement Cost reduction	Waste reduction (Lean)	Customer satisfaction	Health and Safety Environment

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Quality of product/service Time utilisation Output optimization Employee engagement Integration of all work processes	Flexibility Asset yield	Delivery period	Reliability Operational efficiency
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As an extension of previous review on OpEx in the oil and gas sector, the dimensions are further elaborated in the subsequent sections of this article. The dimensions as indicated in Table 1 shows that in the oil and gas sector, operational excellence has four dimensions that includes safety and health, operational efficiency, reliability of assets and process and environmental performance. Few researchers like Moktadir et al. (2020) conducted his study on the key performance indicators (KPI) of OpEx, which included management, operations, quality, economic, social and environmental. In the study they maintained that for a firm to attain excellence in operations they must have sound management, low cost (efficiency), care for the staff (safety and welfare) and a sound environmental management that prioritise safety of the environment at all times. An elaborate review on these dimension was done to further substantiate some of the meanings, factors, elements and fundamentally the measurement constructs that the literature assessment presents.

### **3.1. Safety and Health in the Oil and Gas**

Most businesses, in almost every industry, operate in a relatively risky environment. These risks must be reduced to a reasonable point for an organisation to be successful. Oil and gas sector is one risky industry as regards health and safety (Osabutey *et al.*, 2013). Health and safety in the occupation are referred to as the science of expectation, recognition, assessment and control of hazards emanating from the work process that impair the health and well-being of employees (Alli, 2008). Safety is the absence of adverse event that involves an unscheduled and intolerable loss often experienced by organisations, either on their staff, asset or process (Alkhaldi *et al.*, 2017). It is about staff wellbeing in the work place, the security of their lives and assurance of a healthy environment.

Health and safety represent major risks exposure firm's staffs are in the oil and gas sector, hence the need for effective management like for any other segment of the business risks (Fuller and Vassie, 2001; Mitchell, 2015). As a discipline, occupational health and safety promote the maintenance of high intensity of mental, physical and social wellbeing of employees in places of work and process (Ratna & Kaur 2016; Bennet & Foster, 2007). Generally speaking, health and safety policies are essential for organisations because it contributes to all facets of business performance as a vein of commitment to firms continuous improvement ideologies (McCracken, 2008; Mitchell, 2015). The policies assure people, the environment, regulators and every other stakeholder's expectations are fulfilled. Safety is the best starting point for improving business results leading to operational

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excellence (Wilson, 2012). It is the provision of a mechanism to enhance the working environment that provides staff and community with the assurance of safety and lesser harm to their body and their environment.

Safety and health are concerns that require strategic management attention because they can directly affect firm operational performance. According to British Petroleum BP (2016), functional safety leads to reliable operations of their assets, better efficiency and eventually, higher financial performance. As companies are working towards achieving and sustaining internal effectiveness, they also consider health and safety as a compliance issue that must be attended to for smooth operations in the oil and gas sector (Kolios & Luengo, 2016). It is a compliance risk for firms in the industry who fail to manage safety and health in their operations. However, Fuller and Vassie (2001) have it that fewer or no cases of staff accidents and fatality do not automatically indicate that safety and health are effectively managed in an organisation. There are situations where incidents frequencies will rise in an organisation despite their effective health and safety management. Generic cases like a natural disaster, terror attacks or pipeline oil spillage as a result of the explosion cannot be stopped. For example the case of BP deepwater horizon in the Gulf of Mexico started as a small operational problem in the oil field that was not contained, which later turned out to be a serious incident where the spill led to the release of gas that kindles serious explosions that led to fire, injuries to people and eventual death (Nolan & Anderson, 2015). The problem led to a severe environmental disaster that cost the company millions of dollars.

Oil and Gas exploration, refining, transportation requires safety and health program to achieve operational performance excellence. According to National Institute for Occupational Safety and Health (NIOSH) (2010), oil and gas health and safety program is aimed at identifying potential risk exposures to chemicals, preventing bodily injuries and health to the workforce in the field. Because of these issues, ILO (2016) has been promoting a three-way collective effort of government, companies and workers commitment to continue building and implementing a preventive safety and health culture in the oil and gas industry. The interactive viewpoint on health and safety concerns were for ensuring regulations and checks among all parties involved. However, at some quotas, the blame for accident events are put on human error as the primary cause of avoidable events (ILO, 2016). And since human factor is played out, work process performance would be affected, and by implication, performance variation is increased. Nonetheless, studies indicated that the management of safety and health is effective when staff participation and sound leadership are in place (Bornstein & Hart, 2010). An active firm and unit leadership are essential as well as worker participation in safety and health management.

In a study conducted by Bornstein and Hart (2010) indicated that the management respondents harmer on individual employee involvement in safety and health management. On the other hand, employee respondents capitalised on management commitment as a significant ingredient to a safe and healthy work environment. It is now evident that management commitment/leadership brings about employee engagement in the organisation's safety and health management, which in turn improve operational performance and by extension operational excellence. Similarly, the findings from the study by Bornstein and Hart (2010) further buttresses the need for strong leadership in hazard identification and prompt response to events, and improved workers are training that can change their risk perception.

The American Petroleum Institute (API) (2004) revealed in a review report on safety incidents in oil firms operations between 1959 -1978. They investigated 88 incidents, out of which above 50% of the incident were predominantly caused by fire and explosion. The findings indicated that major sources of safety issues were equipment failure (28%), human error (28%), faulty designs and construction (30%), insufficient processes (11%) and poor facilities inspection (5%). Other causes were procedural upsets (2%) and education (5%). They are considered as the causes of incidents that needed to be addressed. However, these causes are not always the case for all risk events; they do vary on the scenario and depending on the industry. Alkhaldi *et al.* (2017) posited that earlier studies indicated and proven that about 70% of the accidents in the oil and gas industry were as a result of staff error, negligence and sheer violation of operating rules. According to Penkey and Siddiqui (2015), regulatory framework and firm policies could not possibly address all the risk, the need for risk assessment approaches and safety management is eminent for handling individual case potentials and also when they occur. All the arguments are emphasising on human factor (inadequate inspection, designs, negligence and unsafe acts) as the dominant cause of industrial accidents, as such workers are often blamed for it. Well, the blame on people will continue in their capacities are not built to be conscious of potential causes and effect of certain incidents and how to identify, report and or take precautionary actions or reaction.

Information technology is becoming an essential ingredient in the operation of most establishments. According to Ratna and Kaur (2016) the introduction of IT, information about outbreak of airborne and communicable diseases could be controlled, engineering safety can be achieved, incidents that can lead to bodily injuries can be minimized and all concerns on issues of heat stress, falls, explosion and machinery operations can as well be under severe watch. IT programs are helpful in this regard, as they help virtualise incidents before they occur and send an immediate signal as they occurred. David *et al.* (2003) posited that IT reduces errors by preventing adverse events by

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facilitating rapid response after an adverse event and helps in tracking and providing feedback about the undesired incident.

Some firms use IT as a tool for activity tracking that enables data downloads to smartphones, which are further put to use for developing organisational risk profile (Harrison and Dawson, 2016). The monitoring helps in recording incidents such as near-miss, falls, and exposures to gas and other health-related issues, and by extension, reduce insurance premium chargeable to firms. Similarly, Felemban and Sheikh (2013) opined that IT, specifically Radio Frequency Identification (RFID) is helping oil and gas companies in many ways. Areas such as search and rescue in the oil rig for cases of falls into the sea or missing person using RFID badges and other sensors (GPS and water presence). The device is used to track victims; mandatory checklist equipment helps detects and verify whether personnel wears the compulsory safety gadgets; worker tracking installed across all facilities to record and track every movement of staff that help report unauthorised movements, incidents of stair falls, health-related conditions, personnel headcounts and incidence audit. The contributions of IT to health and safety management in the oil and gas sector are enormous. Although it is capital intensive, it is better to invest in the prevention than to pay for the health or life of the staff and the cost of disruption in operation due to the incidence.

Strategising ways to manage health and safety in the oil and gas using any form of IT to support in mitigating incidents requires data processing and measurement (Tan, Ortiz-Gallardo & Perrons, 2016). This data, looking at the functions of RFID elaborated above, is enormous that a Big data solutions could measure and analyse it in details. Big Data helps companies track and spot potential incidents before they occur (Campbell, Polo & Bouly, 2012; DeVol, 2004; Akoum & Mahjoub, 2013), it, however, has its lapses in oil and gas HSE characterized by already text coded, customized, and inaccessible data, also known as dark data.

In spite of increased understanding and awareness of workplace hazards, the poor performance of safety and health is prevalent in organisations which increase costs of managing incidences when they occur. Policies are made by government agencies or regulatory bodies to ensure the implementation of health and safety programs across companies (Alkhaldi *et al.*, 2017). The global oil and gas regulatory guidelines provide that hazards and risks on health and safety established after project assessment of site – host community, the assimilative capacity of the environment are to be adhered to by companies (International Finance Corporation (IFC) and World Bank Group (WBG), 2007). The guidelines cover areas of information on seismic exploration, drilling, development and production activities, transportation, pump stations and even decommissioning.



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According to IFC and WBG (2007), the guideline justifies the protection of safety and health of people and the environment throughout the processes. Regulations vary among countries; it's either on their legal regime, method, institutional engagements and or management capacities. However, they are all aiming at reducing the number of incidents among oil project employees to a zero rate, particularly accidents that could lead to loss of work hours, disabilities, infections or even fatalities (IFC & WBG, 2007). Risk management matrix development for safety and health is dependent on regulatory requirements, local legislative content, firm's standard guidance (IPIECA & OGP, 2011) and regulatory regimes (ILO, 2016). Without regulations, more companies will not appreciate the health and safety of their employees.

A regulatory regime is a context to which a country controls how oil companies operate in their territories. According to ILO (2016), oil-rich countries govern health and safety undertakings of oil and gas firms based on their regulatory regimes – Prescriptive or performance-based methods. The prescriptive regime gives the regulatory body the power to define quantifiable goals and ensures operators compliance to meet the set requirements, whereas the performance-based approach allows the operators to attain the set goals using their means (ILO, 2016). The difference between the two regulatory regimes is further explained in Table 2 In their view, Elsevier (2016) regulatory landscape regarding HSE is among the serious challenges facing oil companies because the rules and standards will continue to evolve.

**Table 2: Description of the two major regulatory regimes in the oil and gas industry**  
ILO (2016)

<b>Prescriptive regime</b>	<b>Performance-based regime</b>
Gives the competent authorities the possibility to specify exact requirements	Depends on dialogue and trust between the competent authorities and the industry
Requires comprehensive and detailed inspection	The companies need to aim for good safety culture
Reduces operators' responsibility to evaluate and manage risk	Tripartite cooperation and tripartite involvement
Depends on the industry's willingness to give access to and share information	Transparency and openness about reporting of failures and non-compliance
Can lag behind technological and social development	Requires a high degree of knowledge and competence

### **3.1.1. Health and Safety Management System (HSMS)**

Management of organisations is responsible for the health and safety of all its employees at all levels. They must reduce incidents of accidents resulting into injuries to staff and health-related issues in the organisation and the entire community (Alli, 2008). According to Alli, HSMS needs to be a strategic goal of any firm as setting targets, and customer service is to the organisation. It involves people who are the primary resources for organisational success; they manipulate other resources like

machines, raw materials and money to produce goods or services. Therefore, this means people safety and their health guarantees performance in an organisation. Thus, the management of health and safety must be integrated into the firm's business culture and procedures (Alli, 2008; Bennet & Foster, 2007). According to ILO (2009) and Alli (2008), an organisation as a whole need to prioritise health and safety as its primary objectives, then build a structure for HSMS undertakings with a clear definition of risk-prone areas, causes and consequences should they occur. Develop action plans and activities to contend the impact (reduce or prevent it) of diseases that cause ill health and bodily injuries.

The action plan would have to be evolving as situations and incidents may vary from time to time. Some incidents, fatalities, injuries recorded and lost time injury frequency has been used in recent time to measure safety and health performance in the oil and gas industry (Tang *et al.*, 2017). Some of the core drivers of HSMS in the organisation include resources and commitment from the management, employee's participation, and training.

In a study, conducted on Chinese shipping industry by Xue, Walters and Tang (2015), it revealed the existence of an imbalance between Shipmaster and crew participation in HSM, in that the latter lack of commitment to health and safety caused an indirect effect on crew's safety, health and wellbeing. The result from the shipping industry shows how inefficiency on the part of management that led to forcing the shipmaster to sail to a port in a prolonged sailing condition that affected the general performance of the crew members. For this kind of situations, a functional unit needs to be created to see the implementation of HSMS that coordinates and delegates authority alongside funding to unit managers (ILO, 2009). This responsibility should further be delegated to supervisors because they are always with workers in the field. For this reason, they should be offering technical information and support, health and safety administration and provide training to subordinates. These actions promotes OpEx successful implementation, as workers becomes motivated by the provision of health facilities and continuous surveillance organisational performance improves.

The combination of management commitment and employee participation in health and safety program is incomplete when the staffs have no relevant skills. Employee training on health and safety is vital in HSMS integration for continuous improvement in the work process (Alli, 2008; Bennet & Foster, 2007). Apart from staff training on health and safety, management needs to build a culture in that regard to make it a norm in the organisation. According to Alkhalidi *et al.* (2017), safety, risk perception and beliefs, trigger of events and safety culture are requisites for managing safety and health risks and developing preventive strategies in an organisation.

Safety and health as detailed in the above discussion, it shows that certain factors could influence the performance of health and safety as one of the dimensions of OpEx in the oil and gas

sector. These factors are comprised of leadership, staff capacity, information technology, firm ownership structure and regulations supervising oil and gas industry operations. Perhaps if the elements are applied as study variables could explain a significant effect on OpEx as a whole in the oil and gas sector.

### **3.2. Asset and Process Reliability, and Integrity**

Reliability is another essential dimension that explains operational excellence in the oil and gas sector after health and safety. A machine, apparatus or system can maintain consistency in performance as regards intended function without failure (Business Dictionary, 2017). In the oil and gas business, capital assets are integral in the operations of the sector, particularly in drilling rigs, offshore operations, upstream oil wells, pipelines, LNG terminals and refineries (midstream and downstream) activities (Ossai, 2012). According to Nolan and Anderson (2015), reliability is the assurance enjoyed by companies on their assets, and personnel performance in production and product or service availability. Reliability is the ability of firms to identify potential asset failures for elimination, tracks and investigates such failures for improvement while considering assets lifespan from design to decommissioning (Ernst & Young, 2015).

The pinnacle of operations in the oil and gas is the ability of companies to meet and sustain production expectations reliably. According to Ernst and Young (2015), all capital projects must be converted into production assets, improve daily asset uptime, prevent an unnecessary shutdown and reduce the impacts of planned outages on the performance of the firm. For the reliability to be achieved, therefore, regular and plan maintenance is needed to align with critical risks identified in operation. According to Nolan and Anderson (2015), reliability is resolving issues related to facilities, business process and people that cause challenges blocking performance in an organisation. The resolution of the problems about assets functionality, maintenance, service/product delivery and specification are aided by an IT tool called RFID (Felemban & Sheikh, 2013).

The RFID, according to Felemban and Sheikh (2013), provides solutions to asset management that are comprised of equipment identification of unreachable pipelines (underwater or buried), flanges and all other equipment deployed in a hostile environment that exposes them to corrosion, rust, abrasion and other wearing factors. Other uses of RFID on assets, according to Felemban and Sheikh (2013), are for monitoring and maintenance of equipment undersea and at drilling, exploration and transportation. Such that when the assets are due for maintenance an alert is received, this is so because the day the assets were acquired, their lifespan and periods of servicing are imputed into the database. RFID help also monitors workflow from start to the last stage of production and report any

near miss and can as well allow workers to read instruction even when there is no internet connectivity because it is cloud-enabled. According to BP (2016), when recent technology is employed in operations for effective safety management and reliability of assets, thereby reducing technical risks that block efficiency of performance. BP (2016) maintain that with new digital solutions, potential issues with facilities that could lead to unexpected shutdown, causing loss of revenue and the rise of maintenance cost can be detected earlier. The early detection helps the firm save money by managing the issues at the micro level than when it goes major because of the multiplier effects on the revenue, environment and market positioning. Robust maintenance and inspection of assets, new or old may lead to higher reliability in their performance (Khan & Haddara, 2004).

Age is critical to the optimal performance of assets because of wear and tear or depreciation. According to Ossai (2012), the continuous exploitation of assets and ageing led to failures in the oil and gas plants. He maintained that research has shown that in the period between 1980 – 2006 major hazard incidents in Europe, half of them were caused by ageing facilities. And since plant safety is somehow dependent on assets reliability, the ageing should be considered as necessary as any other operational element. According to Khan and Haddara (2004), to achieve safe and efficient asset performance, it is pertinent to uphold reliability by reducing and eliminating unscheduled breakdowns.

The nature of capital investment in the oil and gas and the cost of downtime due to unscheduled breakdown are worrisome to the industry because it affects the availability of products and reliability of assets. Hence the need for condition-based maintenance, as opined by Veldman, Klingenberg and Wortman (2011), it is a program that recommends maintenance by processing information from condition monitoring sources and the remaining productive life of an asset or its components. The program helps in predicting maintenance need in good time before it gets worse-off in oil firms. However, the condition-based maintenance is achievable when staff are knowledgeable, the existence of a technical system and a sound managerial system as postulated by Veldman *et al.* (2011). It is a clear indication that staff capacity needs to be built for condition-based maintenance to attain reliability and by extension, operational excellence. It is so because of the complexities of plants and equipment and sophistication of applications or programs; operators need the knowledge to make the diagnosis.

It is also critical in the oil and gas sector, unlike in service or manufacturing, to manage asset integrity and reliability to minimise downtime because it is costly for the industry. According to DiMatteo (2014), there are two primary approaches (risk-based inspection and reliability-centred maintenance) for managing asset integrity and reliability. Risk-based inspection (RBI) is used to minimise risk through strategic inspection plans and analysis that aligns nature and level of asset's

potential threat to determine the frequency of inspection. This technique is easy and cost-effective because the focus of inspection would be more on assets with higher risk tendencies. Thus, it ultimately reduces safety and environmental incidences (DiMatteo, 2014). The risk-based method, however, might expose other assets that are presumed to have a less potential risk to a more severe one; it is so because the frequency of inspection on them drops according to the method. In the process, the assets would develop a gradual problem that ought to be handled before it becomes big within the inspection interval period.

The other method, as put by DiMatteo (2014), is the reliability-based maintenance. This approach uses the result of assets condition analysis and performance to determine maintenance for more complex machinery whose failure or breakdown consequences are more severe. In this method, the assets performance priority and impact are considered first to avoid waste of time and resources on time-based or usage-based maintenance and breakdown repairs. To this end, a small and marginal improvement in the maintenance process brings about the rise in productivity, cycle times and profitability (DiMatteo, 2014). So to achieve the reliability of assets, maintenance is essential.

The oil and gas industry involves large capital expenditures as well as operational costs. The profitability of firms in the sector is highly dependent upon the reliability, availability and maintainability of the systems and assets employed in the production and operational process (Ostebo *et al.*, 2018). Hence, for the control of production loss in the oil and gas sector facilities and downtime in operations, a consistent, cohesive reliability procedure is required. This requirement could be made during the technology development stage, in project implementation or operations by considering global best practices (Ostebo *et al.*, 2018).

The developed framework by Ostebo (2018) covers the design, maintenance, availability of system, production and delivery of final products. These functions are broken into time-bound and volume bound. So, to achieve reliability and efficiency targets, oil and gas companies must develop data strategies that address several concerns (Bradley, 2013). These considerations, according to him, are holding the data within the firm, corporate structure and building an infrastructure to store and retrieve when needed.

From the above discussion, there is every clue that certain factors could be crucial for improving assets and process reliability in the oil sector as a dimension of OpEx. These factors include dedicated leadership, information technology tools, staff training, firm size and regulations guiding the operations of the oil and gas industry. Perhaps if the elements are applied as study variables could explain a significant effect on OpEx as a whole in the oil and gas sector.

### **3.3. Operational Efficiency**

Efficiency is the optimal level of the desired performance that maximises every resource for better output. According to Business Dictionary (2017) efficiency is the comparison between job performed with what ought to be achieved using similar resources. Efficiency in operation is considered as the relationship between business input and the output generated from business operation, where output increases with little or no change in input (Nolan & Anderson, 2015). As the case may be, these inputs are the resources put (cost, people, time) and the outputs are the revenue, customers, opportunities and productivity. The common scenarios in an improved efficiency are the same output for less input, more output for the same input and much more output for more input (Nolan & Anderson, 2015). This efficiency is fast-tracked with advancement in digital technology that offers innovative tools and systems that leverages on information to modernise operations for higher oil production output (Ernst & Young, 2015). The IT helps in compressing or merging repetitive processes to reduce the cost of production, thereby achieving efficiency in an organisation. This, of course, would be a problem as heads will roll, as employees and their unions will reject staff rationalisation by all means. However, Ernst and Young (2015) argued that companies' concerns are strategic on the hidden inefficiency and correctional work costs and not the cost of salaries and wages, and notwithstanding oil prices or projected profit.

Operational efficiency in the oil and gas is very vital as its effects cuts across so many functions of the sector because of the complexity of operating in the industry. Murshid (1988) considered efficiency as the outcome from the application of a suitable administrative principle that guides the internal performance of a firm. According to Oke and Kareem (2013), operational efficiency is an equilibrium position reached by an oil firm. This equilibrium means that the ability of a firm to create a surplus or excess revenue or output with optimum use of resources/inputs. Farrell (1957) postulated that operational efficiency is comprised of two elements, technical and allocative efficiency. These, according to Farrell, are expressed in terms of maximising output with little inputs and the utilisation of such inputs in proportion to their respective values.

Conversely, Oke and Kareem (2013) are of the view that companies could be technically and allocative efficient, but their operations might not be optimal. It means that efficiency does not guaranty a firm's profitability because of industry size, which might be efficient in one firm might turn out to be inefficient in another that is relatively bigger. On the other hand, Mitchell (2015) argued that operational efficiency is that ability to deliver a product or service with the least waste, operating, and energy costs by a firm. It means that efficiency is about how cost of operation is minimised at the same time output is optimised.

In striving to achieve operational excellence by maintaining operational efficiency, companies are employing the use of big data as an IT tool. According to Tan, Ortiz-Gallardo and Perrons (2016), companies used big data to increase operational efficiency, effective customer service delivery, explore new market opportunities and develop new products. In a more elaborate view of the role of IT, Barry (2012) posited that real-life processes combine with sustained, committed leadership and IT best practice extends beyond safety and assurances benefits to delivering efficiency gains to the firm. It means that when IT is embedded in the entire work process, it can guaranty interactions between units and also between people and machines at reduced time lag. Elsevier (2016) further emphasised the need for information data to improve agility in operational efficiency. Agility in operations means having an extraordinary capability to balance cost, quality and time to produce and exceeds changing markets requirements profitably (Carvalho *et al.*, 2017). The ability of a firm to optimise the use of resources to achieve and sustain organisational goals is about efficiency.

Efficiency is an essential factor in the path of success in the oil and gas sector. According to Bai and Liyanage (2012), enhancing process efficiency and effectiveness in the cost of oil and gas production is critically needed. In their report BP (2016) shows that their efficiency had improved because the books of the company indicated a foreseeable loss due to drop in gas realisation and unfavourable foreign exchange experience; however their lower costs and efficiency offset that potential loss scenario. The drop in cost was associated with exploration write-offs, depreciation, depletion, lower rig cancellation charges and an increase in production. In the same strive for cost reduction; companies consider human resources activities that involve the recruitment of suitable staff and training of personnel for enhancing their capacity to improve efficiency (Namu *et al.*, 2014). It is clear that when staffs have capacity can help reduce waste in the production process. Namu *et al.* (2014) further maintained that another strategy for cost reduction in operations is to exploit IT in the work process, with a click of a mouse, customers' orders are processed, inventories are checked and confirmed price of the spare part. As it is, cost reduction increases operational efficiency and firm performance at large.

Efficiency in the oil and gas sector, either operational or revenue-based, is affected by the ownership structure of the firm. According to Hartley and Medlock (2012), the significant difference between NOCs and shareholder-owned oil firms regarding efficiency cannot be underestimated. Hartley and Medlock (2008) further argued that a NOC management faces political pressure to employ staff they do not require and also granting resource rents to domestic companies and workers at a discounted value that affects NOC operations as well as revenue. However, other factors affect the operational efficiency of NOCs, issue such as corruption of officials. As in the case of Nigeria, all the

refineries are not working; this is costing the Nigerian NOC (NNPC) more money to lift the crude for refining abroad then import the refined product at international market rate. The practice had created windows for corruption, as government pays subsidies for the imported refined petroleum products.

From the review presented above, there is a hint that some factors could be critical on how the operational efficiency of the oil sector could be enhanced as an OpEx dimension. These recognised factors include committed leadership, staff capacity, information technology tools, and firm ownership. Conceivably, if the factors are utilised as research variables could play a significant role in OpEx successful implementation as a whole in the oil and gas sector.

### **3.4. Environmental Performance**

The environment is another critical dimension of OE in the oil and gas industry. Awareness of the importance of environmental challenges has turned out to be the central concern of the oil sector as well as regulators some decades ago (Oil industry international Exploration and Production (EandP) Forum and United Nations Environment Programme Industry and Environment Centre (UNEP), 1997). The environment is comprised of the host communities where oil production activities are taking place, the animals, vegetation and the climate. These activities had further exposed the global environment to greater danger because of climate change. According to the EandP Forum and UNEP (1997) report, oil and gas activities is affecting the environment with oil spills, accidents and fires, land damage, air and water pollution.

According to U.S. EPA (2008), the release of wastes due to oil and gas exploration activities like fluid leakages from drilling, air emissions and storage wastes made it difficult for the industry to eliminate the effects on the environment. The efforts of the oil firms to reduce such adverse effects are seen in their environmental performances. These efforts and practices to minimise the impact on the environment can be executed at the internal level or the broader supply chain level operations of a firm (Graham & McAdam, 2016). Environmental practices at the internal operations have been researched by Hart and Dowell (2011) that sought to measure linkage with firm performance. Hart and Dowel (2011) maintained that the disclosure by a firm of its environmental practices affects its market performance. When the experience is not right, investors become scared of a repeat of similar experience in the future, thus leading to adverse reactions.

The oil and gas industry, unlike other sectors of the economy, is faced with quite numerous issues that pose operational bottlenecks in achieving environmental performance. Performance in this sense that, the environment is eliminated of pollutions of all kinds. These constraints are associated



with the continuous need for exploration of oil and natural gas for government revenue generation. According to U.S. EPA (2008) wastes are generated from drilling activities, and extraction of natural resources, which are mostly not reusable in any form and they must be disposed of to prevent the environment and the people. Despite efforts by the oil firms to curb the challenges, the problems are still evolving. Hence there is the need to do more on some environmental concerns to attain excellence (U.S. EPA, 2008). Impliedly, the environment may not be free from pollution as long as oil and gas production cannot be stopped. However, it can be reduced and or controlled by internal operations.

As suggested by U.S. EPA (2008) to remedy these worries, all stakeholders such as government and the industry must get to the drawing board to redirect and improve existing policies, regulations and technologies, with commitment and innovation. Earlier studies like that of Ramanathan *et al.* (2017) have proven that regulation indeed influences the environmental performance of the firm. The pressure to control the impact of oil production on the environment doesn't just stop with the government regulations, even NGOs, congressional oversight functions, and communities continue to scrutinise the probable risks associated with expanding production on land or high sea (U.S. EPA, 2008). In a study conducted by Kassinis and Vafeas (2006) on the effect of pressure from stakeholders (government and community) on environmental performance, the result shows that community pressure significantly improved such performance of oil and gas firms. By implication, community interaction with oil and gas firms would help reduce some of the environmental challenges. Also, a powerful pollution prevention strategy reduces potential and actual adverse impacts on the environment created during production activities (Schoenherr, 2012).

There is every indication from the review that certain factors could influence how environment performance of the oil sector could be improved as a dimension of OpEx. These identified factors include committed leadership, staff capacity, information technology tools, firm ownership and size and regulations guiding the operations of the oil and gas industry. Perhaps if the factors are applied as study variables could explain the significant effect on OpEx as a whole in the oil and gas sector.

#### **4. MEASUREMENT OF OPEX DIMENSIONS**

According to Hox (1997) operationalisation of variables is the interpretation of a theoretical construct into observable phenomena by identifying empirical indicators for the concepts and their sub-domains. The dimensions are particular to oil and gas operations as put by (Ernst & Young, 2015; Chevron, 2010; Wilson, 2012; McCreery *et al.*, 2013; Feblowitz, 2015; Edgeman, 2014; Deloitte, 2015; Elsevier, 2016; Asat *et al.*, 2015; Soliman, 2017; Kandasamy, 2016; Parker, 1999; Mitchell,

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2015; Nolan & Anderson; Heath *et al.*, 2017; Deloitte, 2015; QEHS, 2017). The measurement items were driven from the works of the scholars as cited earlier

An exploratory factor analysis (EFA) was conducted on the adapted items, cross loadings, free standing and those constructs with coefficients below 0.5 were deleted after series of iterations. The measurement constructs or items that were tested are presented in Table 4. The rotated matrixes were within the accepted threshold of 0.5 as argued by Yong and Pearce (2013).

**Table 4: Measurement Items of Operational excellence Dimension**

Items	Operational Excellence	Rotated Matrix
	Safety and Health	
1	Facilities and machines designs have improved to prevent injuries to people and fatalities	0.795
2	A comprehensive safety program related to safe-work-practices is in place for each location	0.758
3	Safety and health risk management process is periodically reviewed to assess risks related to health, facility operations and modifications	0.712
4	There is a drop in staff injuries, fatality and process incidents	0.695
5	Lost workdays hours per employee (due to injury or health) are continuously dropping	0.656
6	Our staff now have work confidence and health assurances because of available medical services	0.639
7	All aspects of operations essential to safety and integrity are properly designed and constructed, tested, inspected before the commencement of operation	0.557
8	Emergency response teams are always on red alert to handle incidents	0.541
<b>Assets and process Reliability</b>		
1	Pre-startup reviews on new or idle facilities are conducted prior to operation and after shutdown to ascertain compliance	0.785
2	Failure analysis is conducted to determine causes and develop steps to mitigate its effects	0.729
3	Unplanned plant shutdown is minimal now due to proactive maintenance and condition monitoring of the mechanical integrity of our assets	0.685
4	Ageing assets are continuously maintained and often replaced before decommissioning	0.654
<b>Operational Efficiency</b>		
1	Costs related to production, maintenance, litigations, and risk incidences are reduced	0.787
2	Some processes in operations have been integrated for speedy and efficient production	0.707
3	Operational process is optimised, and profitability is improved through the efficient use of people, time and assets	0.654
4	Quality has improved through interacted assurance processes across design, marketing and production units	0.516
<b>Environmental Performance</b>		

1	We identify, assess, mitigate and manage potentially significant risks and impacts to the environment (including living organisms)	0.756
2	We take inventories of all emissions, releases, wastes and potential contamination caused by our operations	0.698
3	We periodically evaluate contractors and sub-contractors on environmental performance for contract renewals and awards	0.612

## **5. CONCLUSION**

Operational excellence in the oil and gas industry has a unique viewpoint, that enough had given room for discussions on the dimensions and constructs that best measures excellence in operations. Earlier reviews had shown some divergent and convergent elements of what constitutes OpEx in the oil and gas sector as compared to other industries. These elements, regarded as dimensions, include health and safety, operational efficiency, assets and process reliability, and environmental performance. Meaning that for firms in the oil and gas industry to achieve excellence in operations, they must maintain standard health and safety system, minimize environmental pollution, reduce cost and improve output. Other parameter for OpEx in the oil and gas is ensuring that the assets and processes, from the point of exploration-retail at the gas stations are reliable all the time. In this review, the dimensions were discussed at length, where particular feature and technical aspect as they relate to some studies that explored some influencing factors. Factors such as leadership, staff capacity, information technology tools, firm ownership and size, risk management and regulations guiding the operations of the oil and gas industry were presented. Perhaps if the factors are explored empirically as study variables could explain a significant effect on OpEx in the oil and gas sector. The current article had elaborated literature on OpEx, especially for the oil and gas industry, extends on earlier review in the area and laid a foundation for future studies. The main contribution of this article was the categorisation of the dimensions of OpEx in the oil and gas sector, itemising and testing of measurement constructs, and the few factors that could be critical to the successful implementation of the program. However, it is not without some few challenges and limitations, which are not far from the papers' inability to propose a framework for the program implementation and empirically test the postulated relationship between the identified factors and OpEx.

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**KAMU KATILIM BANKACILIĞININ GELİR-GİDER VE KARLILIK DEĞİŞKENLERİNE  
DAYALI GRİ İLİŞKİSEL ANALİZ YÖNTEMİYLE DEĞERLENDİRİLMESİ: 2015-2019  
DÖNEM VERİSİNDEN KANITLAR**

**Dr. Mehmet APAN<sup>(1)</sup> Dr. Fatih KAYHAN<sup>(2)</sup>**

<sup>1</sup> Karabük Üniversitesi, Demirçelik Kampüsü, 78050, Karabük Türkiye, [mehmetapan@karabuk.edu.tr](mailto:mehmetapan@karabuk.edu.tr), 0000-0001-9471-4810

<sup>2</sup> Kırklareli Üniversitesi, Lüleburgaz Yerleşkesi, Lüleburgaz Kırklareli, [fatih.kayhan@klu.edu.tr](mailto:fatih.kayhan@klu.edu.tr), 0000-0001-7844-8663

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**ÖZET**

*Bu çalışmanın amacı kamu katılım bankacılığının finansal başarısını, sektördeki tüm katılım bankalarının finansal başarıları ile mukayese ederek belirlemektir. Bu amaçla çalışmada, Türkiye'deki katılım bankalarının gelir-gider ve karlılık değişkenlerine dayalı finansal başarı değerlendirmesi, 2015-2019 dönemi verisi kullanılarak yapılmıştır. Katılım Bankacılığı Sektörü'nde kamu tarafından kurulan katılım bankaları ile diğer katılım bankaları arasındaki rekabet artmış ve müşterilere sunulan alternatifler farklılaşmıştır. Ampirik analizlerde 5 tane katılım bankasının finansal başarı değerlendirilmesi için 9 tane finansal oran kullanılmıştır. Katılım bankalarının finansal başarı değerlendirilmesi için GİA (Gri İlişkisel Analiz) yöntemi tercih edilmiştir. Analiz sonucunda, tüm yılların ortalamasında; Kuveyt Türk Katılım Bankasının en iyi finansal başarıyı elde ettiği, onu Vakıf Katılım ve Türkiye Finans Katılım Bankasının takip ettiği tespit edilmiştir.*

**Anahtar Kelimeler:** Katılım Bankacılığı, Kamu Sermayeli Katılım Bankaları, GİA, Faizsiz Bankacılık

**Jel KODLARI:** G20, G21, G29, C60

**AN ASSESSMENT OF THE PUBLIC PARTICIPATION BANKING BY GREY  
RELATIONAL ANALYSIS METHOD BASED ON THE INCOME-EXPENSE AND  
PROFITABILITY VARIABLES: EVIDENCE FROM 2015-2019 DATA**

**Mehmet APAN Ph.D.<sup>(1)</sup>, Fatih KAYHAN Ph.D.<sup>(2)</sup>**

<sup>1</sup> Karabük Üniversitesi, Demirçelik Kampüsü, 78050, Karabük Türkiye, [mehmetapan@karabuk.edu.tr](mailto:mehmetapan@karabuk.edu.tr), 0000-0001-9471-4810

<sup>2</sup> Kırklareli Üniversitesi, Lüleburgaz Yerleşkesi, Lüleburgaz Kırklareli, [fatih.kayhan@klu.edu.tr](mailto:fatih.kayhan@klu.edu.tr), 0000-0001-7844-8663

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**ABSTRACT**

*This study aims to investigate the financial success of public participation banking by comparing the financial success with that of all participation banks in the sector. In this context, financial success assessment based on the income-expenditure and profitability variables of participation banks of Turkey was made using data for the period of 2015-2019. In Turkey, the competition between public participation banks established by state and other participation banks (privately owned) increased considerably and in line with this very fact, alternative financial services provided to customers differentiated remarkably. In the empirical analysis, 9 financial ratios were used to evaluate the financial success of 5 participation banks. The GRA (Grey Relational Analysis) method was preferred for the financial success evaluation of participation banks. The findings show that -on average- for the period of study; Kuveyt Türk Katılım achieved the best financial success, it was followed by Vakıf Katılım and Türkiye Finans.*

**Keywords:** Participation Banking, Public Participation Banking, Grey Relational Analysis, Interest-Free Banking.

**JEL Codes:** G20, G21, G29, C60

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## **1. INTRODUCTION**

There are a total of 53 banks operating in the Turkish banking system, including 34 deposit banks, 13 development and investment banks and 6 participation banks (TKBB, 2020, p.45).

Participation banks are a banking model that works according to the principles of interest-free banking, performs all kinds of banking activities in accordance with these principles, collects funds on the basis of profit and loss share, and provides funds with methods such as trading, partnership and leasing.

The new products that participation banking has brought to the Turkish financial and capital markets with this model are as follows (TKBB, 2020, p. 57-58):

- Murabaha (Usury);
- Mudarebe (Community of Interest);
- Muşareke (Special Form of Partnership);
- Karz-ı Hasen (Good Loan);
- Selem;
- İstisna;
- Sukuk (Interest Free Lease Certificate)  
within the framework of Private Pensions;
- Participation Indices and Mutual Funds based on These Indices;
- Tekâfül (Interest-Free Insurance);
- Yatırım Vekaleti (Proxy for Financial Investment)

The share of Turkish participation banking in the Turkish banking sector and the development of its total assets over the years are given in the table below.

According to this table, while the total assets of participation banking was 120 billion TL in 2015, it reached 284 billion TL in 2019. In this context, the growth change in 2018-2019 was 37.5%. While the total share of participation banks in the Turkish banking sector was 5.1% in 2015, it was 6.3% in 2019.

When compared to Asia and Gulf countries, participation banks in Turkey appear to have relatively low market share (Arslan, 2018, p. 45).

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**Table 1: Asset Development of Participation Banks in Turkey and Total Share of The Industry in Turkish Overall Banking Industry (Million TL)**

<b>Years</b>	<b>Total Assets</b>	<b>Change %</b>	<b>Industry Share %</b>
2015	120.252	15,3	5,1
2016	132.874	10,5	4,9
2017	160.136	20,5	4,9
2018	206.806	29,1	5,3
2019	284.459	37,5	6,3

**Source:** TKBB (The Association of Turkish Participation Banks)

Financial indicators of the participation banks for the period of 2018-2019 can be seen in the following table (Table 2).

This table indicates that there was an increase of 57.4% in the funds collected, an increase of 20% in the funds that participation banks provided to clients (individual and corporate), an increase of 37.5% in total assets, an increase of 29.7% in capital and a 16% increase in net profit.

**Table 2: Financial Indicators of Participation Banks in Turkey (2018 vs. 2019)**

<b>Million TL</b>	<b>2018</b>	<b>2019</b>	<b>Change %</b>
Total Funds Collected	137.220	215.983	57,4
Funds Collected (TL)	60.626	91.145	50,3
Funds Collected (YP)	67.790	106.533	57,2
Precious Metals (YP)	8.804	18.305	107,9
Funds Provided (Utilized)	124.562	149.476	20,0
Total Assets	206.806	284.459	37,5
Capital	16.780	21.767	29,7
Net Profit	2.097	2.433	16,0

**Source:** TKBB

The development in the number of branches and personnel of participation banks is shown below. Accordingly, the number of branches of participation banks was 607 in 2010, while it was 1179

in 2019, there was a two-fold increase in branching. On the other hand, while the number of personnel of participation banks was 12,677 in 2010, it increased to 16,040 in 2019.

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**Table 3: Branch and Personnel Development of Turkish Participation Banks (2010-2019)**

<b>Years</b>	<b>Number of Branches</b>	<b>Yearly Growth (%)</b>	<b>N. of Personnel</b>	<b>Yearly Growth (%)</b>
2010	607	7,0	12.677	7,0
2011	685	12,9	13.851	9,3
2012	828	20,9	15.356	10,9
2013	966	16,7	16.763	9,2
2014	990	2,5	16.270	-2,9
2015	1080	9,1	16.554	1,7
2016	959	-11,2	14.467	-12,6
2017	1032	7,6	15.029	3,9
2018	1122	8,7	15.654	4,2
2019	1179	5,1	16.040	2,5

**Source:** TKBB

The development of the public sector with the introduction of the participation banking sector in Turkey is expected to be a positive development. It is expected that public participation banks will have a substitution and complementary effect on the Turkish Banking System with the public's entry into participation banking. With the public participation banks, the portfolio of the state in the banking sector will expand. Due to trust in the state, customers can be expected to shift from private-funded participation banks to state-owned participation banks. Anticipating the contribution of participation in state-owned banks to the development of the participation banking sector in the long term with the complementary effect should be seen as an optimistic approach (Savaşan & Özdemir, 2015, p. 1-10).

The study consists of five sections.

Introduction part is the first section of the study. The second section is about literature studies. In the third section, the data structure of the study and the methodology is stated, thereafter in the fourth section empirical analysis is provided.

In the fifth section, the result of the study is explained.



## **2. LITERATURE REVIEW**

The studies conducted to determine the financial performance of the participation banking in Turkey by using TOPSIS, VIKOR, CAMELS, DEA, Grey Relational Analysis, WASPAS, Multi-MOORA are briefly summarized below.

In the study conducted by Altan & Candoğan (2014), it is aimed to analyze whether there is a difference between the traditional performance measurement of participation banks and their performances determined according to the Grey Relationship Analysis method. In the results of empirical analysis, it was observed that there was a difference between the performance results determined according to the traditional performance method and the Grey Relationship Analysis method.

A comparative analysis of participation banks with the banking sector was conducted by Savaşan & Ozdemir (2015) to find the effect of public participation banks on the banking sector. In the study, it is predicted that even if the substitution effect is valid in the short term, the complementary effect will be dominant in the long term as the public participation banks enter the banking sector.

It was aimed by Esmer & Bagci (2016) to determine the financial performances of Turkish participation banks by analyzing the 2005-2014 period data with the TOPSIS method. In the study, a comparison of the performance of participation banks based on years was made.

Ayrıçay, Ozcalic of & Bolat (2017) aimed to determine the performance of participation banks in Turkey with the method of AHP and Grey Relationship Analysis by using 2016Q4 data. Performance ranking of participation banks in the study was found to be Vakıf Katılım, Kuveyt Turk, Ziraat Katılım, Türkiye Finans, and Albaraka Turk (Participation Bank).

In a study by Arslan (2018), it is aimed to determine the possible effects of public participation banks entering the participation banking sector with the qualitative research method. In the study, it was observed that there was an increase in the participation banking sector with the opening of public participation banks, but not at the expected level. According to the study it is expected that public participation banks may be preferred more by customers due to state guarantee, and that depending on the development of Turkey's economy the share of public participation banks may increase and also that public participation banks have the power to play an active role in partnerships with entrepreneurs in the development of the country.

Gundogdu (2018) examined financial performance of participation banks operating in Turkey for the period of 2010-2017 with Grey Relationship Analysis method. In the study, it was observed

that the financial performance of participation banks for the analysis period showed an unstable structure.

Güney (2018) analyzed the quarterly data of 2016Q1-2017Q4 using the data envelopment analysis method to determine the financial efficiency of Ziraat Katılım and Vakıf Katılım banks established by the state. It is found that in empirical analysis that Ziraat Katılım Bank was fully effective in 4 periods according to CCR model and 7 periods according to BCC model; on the other hand Vakıf Katılım Bank effective in 3 periods for CCR model and 7 periods for BCC model.

Karcioğlu et al. (2018) aims to analyze the financial performances of public and private participation banks using the 2016Q1-2017Q2 period data. In empirical analysis, it has been observed that the financial performances of public and private participation banks show different performances on the basis of criteria, and that public participation banks need time to develop.

The rating of Public Participation Banks was analyzed by CAMELS method by Eyceyurt-Batır (2019). 2015-2017 period data was used for this analysis. In empirical analysis, it was determined that Ziraat Katılım and Vakıf Katılım (participation) banks provided a score above the average in the average CAMELS scores for the analysis period.

Gezen (2019) studied financial performance of participation banks in Turkey, with the method of Entropy and WASPAS for the period 2010-2017. In empirical analysis; for 2010, 2011, 2012, 2013, 2014 and 2015 Turkey Finans Katılım Bank A.Ş. had the best performance and that Kuveyt Türk Katılım Bank Inc. had the best performance for 2016 and 2017.

Hatunoğlu, Satır & Yaşar (2019) conducted a study to determine the corporate social responsibility performance of participation banks with the Entropy-based TOPSIS method. In the study, period of 2013-2017 (for participation banks) was analyzed. In empirical analysis Albaraka Turk Katılım Bank had highest performance for corporate responsibility.

Ongen (2019) carried out a study to determine the share of Participation Banking in the Turkish Banking Sector according to basic indicators. 2014-2017 period data was analyzed in the study. Empirical analyses show that participation banking is an important financial actor in the Turkish Banking Sector and its market share is expected to increase.

Karavardar & Çilek (2020) analyzed 2016-2018 period data of participation banks in Turkey with Multi-MOORA method. In empirical analysis, it was observed that the best financial efficiency was provided by Vakıf Katılım (Participation) Bank.

Kartal (2020) carried out a performance analysis of participation banks operating in Turkey for the 2017-2018 period with the VIK method. Through empirical analysis, changes in performance rankings of participation banks can be interpreted as an indicator of competition in the sector.

Tetik & Şahin (2020) examined the financial performance of 7 participation banks operating in Turkey in the years 2011 to 2019 by TOPSIS method. Empirical analysis of participation banks in Türkiye Finans Katılım Bank had the highest financial performance.

### 3. DATA AND METHODOLOGY

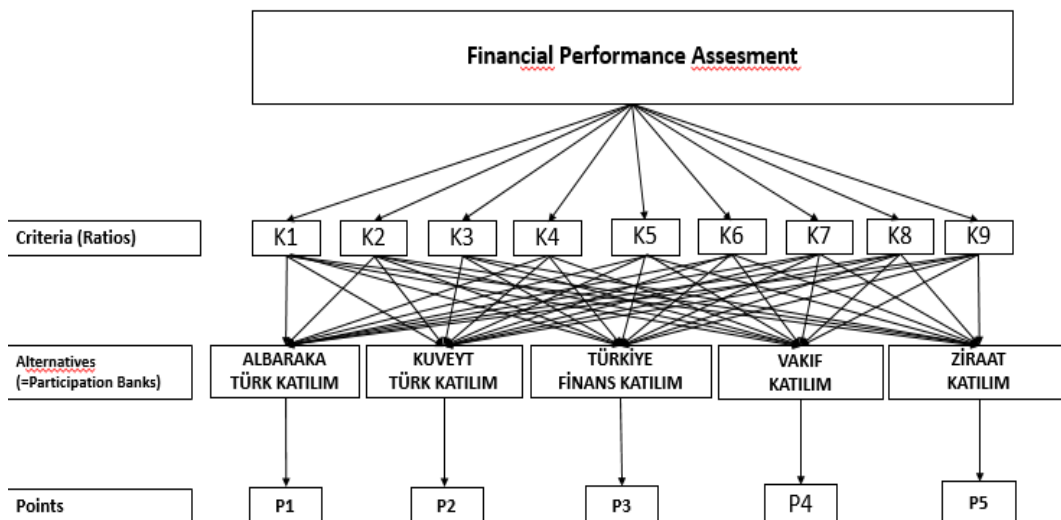
This study aims to determine the financial performance of public participation banking. For this purpose, data about the Turkish Participation Banking for the period of 2015-2019 (for comparative analysis of the financial performance of private and public participation banks) is provided from official web page of the Participation Banks Association of Turkey ([www.tkbb.org.tr](http://www.tkbb.org.tr)). The names of the participation banks included in the study are shown in the table below.

**Table 4: Participation Banks Operating in Turkey**

No	Banks	Capital Structure	Establishment
1	Albaraka Türk Katılım Bankası A.Ş.	Privately Owned	1985
2	Kuveyt Türk Katılım Bankası A.Ş.	Privately Owned	1989
3	Türkiye Finans Katılım Bankası A.Ş.	Privately Owned	2005
4	Vakıf Katılım Bankası A.Ş.	State Bank	2016
5	Ziraat Katılım Bankası A.Ş.	State Bank	2015

**Kaynak:** TKBB

The model created to evaluate the financial performance of participation banks is shown below.



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In determining the criteria of the working model and the qualifications of these criteria; the studies of Altan & Candoğan (2014) Ayriçay, Özçalıcı & Bolat, (2017); Gündoğdu (2018) and Kartal (2020) were used. In this framework, the research model criteria and the characteristics of these criteria are shown in the table below.

**Table 5: Criteria and Qualifications**

Code	Criteria	Quality
K1	Net Profit/Loss / Total Assets	Maximum
K2	Net Profit/Loss / Shareholders' Equity	Maximum
K3	Profit Before Tax / Total Assets	Maximum
K4	Net Profit Share After Special Provisions/ Total Assets	Maximum
K5	Net Profit Share After Special Provisions / Total Operating Income / Expenditure	Maximum
K6	Non- Profit Share Income (Net) / Total Assets	Maximum
K7	Other Operating Income / Total Assets	Minimum
K8	Personnel Expenditures / Other Operating Expenses	Minimum
K9	Non- Profit Share Income (Net) / Other Operating Expenses	Maximum

Equal weight assignment method was preferred for weighting the criteria in the model (Jahan et al., 2012, p. 413).

$$w_j = \frac{1}{n} \quad (1)$$

In the equation numbered (1), n represents the number of criteria and the sum of the weights of the criteria must be equal to 1. The weight values of each criterion are shown below with a table.

**Table 6: Criteria Weights**

K1	K2	K3	K4	K5	K6	K7	K8	K9	Total
0,111	0,111	0,111	0,111	0,111	0,111	0,111	0,111	0,111	1,000

Grey Relational Analysis (GRA) is a grading, classification and decision making method developed with the Grey System Theory. Similarities or differences between factors included in the analysis are expressed as grey relationships. The advantages of the GRA method are that a small data set is sufficient, the calculation processes are simple and no specific package programs are required. Therefore, GRA method was preferred for the analysis of the data set. A mathematical calculation

consisting of 6 steps is performed in order to rank the alternatives in a decision problem based on the GRA method. The steps of this mathematical calculation are indicated below (Feng & Wang, 2000, p. 136; Wu, 2002, p. 211-212; Wang, Lin & Hu, 2007, p. 306-307; Ecer, 2013, p. 175-177; Yıldırım, 2015, p. 229-232; Yazdani vd., 2019, p. 477; Demir, Bircan & Dündar, 2020, p. 161-163; Ersoy, 2020, p. 234-237):

**Table 7: Grey Relational Analysis Method Steps and Mathematical Expressions**

Details of Steps		Mathematical Expressions
<b>Step 1</b>	Preparing Data Set and Formation of Decision Matrix	$X_i = \begin{bmatrix} X_{1(1)} & X_{1(2)} & \cdots & X_{1(n)} \\ X_{2(1)} & X_{2(2)} & \cdots & X_{2(n)} \\ \vdots & \vdots & \ddots & \vdots \\ X_{m(1)} & X_{m(2)} & \cdots & X_{m(n)} \end{bmatrix} \quad (2)$
<b>Step 2</b>	Forming Reference Series and Comparison Matrix	$x_0 = (x_0(j)) \text{ ve } j=1,2,\dots,n \quad (3)$
<b>Step 3</b>	Normalizing Decision Matrix and Forming Normalization Matrix	<p>For utility-side criterion</p> $X_i^* = \frac{x_i(j) - \min x_i(j)}{\max x_i(j) - \min x_i(j)} \quad (4)$ <p>For cost- side criterion</p> $X_i^* = \frac{\max x_i(j) - x_i(j)}{\max x_i(j) - \min x_i(j)} \quad (5)$ <p>For optimal side criterion</p> $X_i^* = \frac{ x_i(j) - x_{ob}(j) }{\max  x_i(j) - x_{ob}(j) } \quad (6)$
<b>Step 4</b>	Forming Absolute Value Table	$\Delta_{0i} =  x_0(j) - x_i^*(j)  \quad (7)$ $X_i^* = \begin{bmatrix} \Delta_{01}(1) & \Delta_{01}(2) & \cdots & \Delta_{01}(n) \\ \Delta_{02}(1) & \Delta_{02}(2) & \cdots & \Delta_{02}(n) \\ \vdots & \vdots & \ddots & \vdots \\ \Delta_{0m}(1) & \Delta_{0m}(2) & \cdots & \Delta_{0m}(n) \end{bmatrix} \quad (8)$
<b>Step 5</b>	Forming Grey Relational Coefficient Matrix	$\gamma_{0i}(j) = \frac{\Delta_{\min} + \zeta \Delta_{\max}}{\Delta_{0i}(j) + \zeta \Delta_{\max}} \quad (9)$
<b>Step 6</b>	Calculating Grey Relational Degree	$\Gamma_{0i} = \frac{1}{n} \sum_{j=1}^n \gamma_{0i}(j) \quad (10)$

As can be seen above, Table 7 indicates 6 main steps for GRA method and its corresponding mathematical expressions. The calculation ends up with calculating grey relational degree.

#### 4. EMPIRICAL ANALYSIS

In this study, in order to determine the financial performance of state-owned participation banks in Turkey, GRA method was applied to the data of 2015-2019 period. The performances of other participation banks were also analyzed for comparison. Income-expense and profitability indicators of participation banks are used for empirical analysis. In the analyses, the method of equal-weight-assignment was preferred for indicators. In this framework, financial performances were determined with the analysis of the data set. With the aim of generalization with the findings obtained in empirical analysis, the performance of public participation banking has been determined. In empirical analysis, the average performances of participation banks as well as the performance of participation banks on a yearly and individual basis according to the GRA method for the period of 2015-2019 are given in Table-8 below.

**Table 8: Performances of Participation Banks for the Period 2015-2019**

<b>Banks \ Years</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>Average</b>
Albaraka Türk	0,7785	0,4776	0,4160	0,4687	0,3459	0,4973
Kuveyt Türk	0,8132	0,7480	0,6882	0,5315	0,6336	0,6829
Türkiye Finans	0,5708	0,5612	0,5092	0,6368	0,7904	0,6137
Vakıf Katılım	NA	0,5317	0,7013	0,7330	0,7372	0,6758
Ziraat Katılım	0,5407	0,5212	0,7308	0,5643	0,6720	0,6058
NA: Not available						

When the performances of participation banks for the period of 2015-2019 are examined; it was determined that the best performance for 2015 was achieved by Kuveyt Türk and the lowest by Ziraat Participation. Here, the realization of such a performance with Ziraat Participation starting its operations in 2015 should be considered as an expected result. This year, only Ziraat Participation exists as a public participation bank. It was determined that the best performance for 2016 was achieved by Kuveyt Turk and the lowest performance by Albaraka Turk. It can be said that the financial performance of Vakıf Katılım and Ziraat Katılım, which are public participation banks for that year, has come to the fore. In 2016 the number of public participation banks increased to two with the activation of Vakıf Katılım, and it became clear that they were important players in the market. It was determined that the best performance for 2017 was achieved by Ziraat Participation and the lowest by Albaraka Türk. It was determined that the best performance for 2018 was achieved by Vakıf Katılım and the lowest performance by Albaraka Türk. The best performance for 2019 was achieved by Türkiye Finans, on the other hand the lowest performance by Albaraka Turk. When the financial

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performance averages for the period 2015-2019 are compared; it was observed that the best performance was achieved by Kuveyt Turk and the lowest performance by Albaraka Turk. Here, it can be said that the performances of public participation banks are realized at a noticeable level.

The results of the financial performance of the participation banks for the period of 2015-2019 are shown in Table-9 by grouping them according to their sector and capital structures.

**Table 9: Participation Banking Groups' 2015-2019 Period Performances**

	2015	2016	2017	2018	2019
Industry Average	0,6758	0,5679	0,6091	0,5869	0,6358
Privately Owned Participation Banks	0,7208	0,5956	0,5378	0,5457	0,5899
Public Participation Banks	0,5407	0,5265	0,7160	0,6486	0,7046

In the comparison of the financial performances of the participation bank groups according to the sector average, it was observed that in 2015 and 2016, privately owned participation banks performed above the sector average; on the other hand, public participation banks performed above the sector average in 2017, 2018 and 2019. This result gives clues that public participation banks are becoming an important player in participation banking.

## 5. CONCLUSION

This study is conducted to investigate financial performance between 2015-2019 year of participation banks operating in Turkey. The aim is to determine the financial performance of public participation banking by comparing it with the financial performance of other participation banks. 9 financial ratios based on income-expense and profitability variables were used to measure the financial performance of participation banks as financial performance evaluation criteria.

GRA method was used for empirical analysis. Equal weighting method was preferred as the criteria weighting method.

Finding of the study indicate that Kuveyt Turk Katılım Bank performed the highest performance in the 2015-2019 period average. On the other hand, Vakıf Katılım Bank, a state-owned participation bank, performed the best in the second place. In the analysis period, it was observed that private participation banks performed above the sector average in 2015 and 2016, while public participation banks performed above the sector average in the 2017-2018-2019 period. For state-owned participation banks to achieve a financial stability and become an important player in the market, they should have a structure where they can compete with competitors and other deposit banks.

Empirical analyses for performance evaluation of state-owned participation banks were carried out with limited research period and variables. Therefore, empirical analyses and results obtained with the study contain limitations. The results obtained in this study cannot be generalized or used in financial investment decision making, which is due to the fact that different results can be obtained in other studies conducted with different periods, different variables and methods. In this study, the financial performance of state-owned participation banks was analyzed using the GRA method and it is expected to guide new studies in the literature.

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**PATERNALİST LİDERLİK ALGILAMALARININ YÖNETİCİYE DUYGUSAL GÜVEN VE  
ÖRGÜTSEL BAĞLILIK ÜZERİNDEKİ ETKİLERİ**

**Dr. Öğr. Üyesi Ebru TOLAY <sup>(1)</sup>**

<sup>1</sup>Dokuz Eylül Üniversitesi, İİBF, İşletme Bölümü, İzmir, Türkiye. ebru.tolay@deu.edu.tr, 0000-0001-5363-8823

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**ÖZET**

*Çalışmanın amacı, akademisyenlerin Paternalist Liderlik algılamalarının, onların Yöneticiye Duygusal Güven ve Örgütsel Bağlılık tutumları üzerindeki etkilerini araştırmaktır. Diğer mesleklerle kıyaslandığında, akademisyenlik mesleğinin yöneticiden bağımsız ve özerk çalışmaya daha elverişli olduğu söylenebilir. Bu nedenle, bu mesleği icra edenlerin paternalist liderlik algılamalarının iş tutumları üzerindeki etkilerinin saptanmasının gerek literatür gerekse yönetici pozisyonundaki akademisyenler açısından önemli olacağı düşünülmektedir.*

*Çalışmanın amacı doğrultusunda bir Survey araştırması tasarlanmış ve İzmir ilindeki üniversitelerde görev yapan akademisyenlere soru formu gönderilerek 200 kişiden veri toplanmıştır. Aşamalı regresyon analizi sonuçlarına göre Yardımsever Liderliğin Yöneticiye Duygusal Güveni yüzde 66 artırdığı ve Otoriter Liderliğin yüzde 27 azalttığı tespit edilmiştir. Duygusal bağlılık sadece Yardımsever Liderlik boyutu tarafından açıklanmış ve bu değişkendeki varyasyonların Duygusal Bağlılıkta yüzde 37'lik bir artışa sebep olduğu saptanmıştır. Son olarak Yardımsever Liderlikteki varyasyonların Normatif bağlılığı yüzde 43 ve Otoriter Liderlikteki varyasyonların ise yüzde 16 artırdığı tespit edilmiştir.*

**Anahtar Kelimeler:** Paternalist Liderlik, Yöneticiye Güven, Örgütsel Bağlılık

**Jel KODLARI:** M12, M14, M19

**EFFECTS OF PATERNALISTIC LEADERSHIP PERCEPTIONS ON AFFECTIVE TRUST  
IN MANAGER AND ORGANIZATIONAL COMMITMENT**

**ABSTRACT**

*The aim of the study is to investigate the effects of academicians' Paternalistic Leadership perceptions on their Affective Trust in Manager and Organizational Commitment attitudes. Compared to other professions, it can be said that the academic profession is more convenient to work independently and autonomously from a manager. Therefore, it is thought that determining the effects of paternalistic leadership perceptions of who perform this profession on job attitudes will be important for both the literature and the academicians in managerial positions.*

*For the purpose of the study, a Survey research was designed and 200 data were collected by sending a questionnaire to academicians working in universities in Izmir. According to the results of the stepwise regression analysis, it was determined that the Benevolent Leadership increased the Affective Trust in Manager by 66 percent and the Authoritarian Leadership decreased by 27 percent. Affective Commitment was explained only by the Benevolent Leadership dimension, and variations in this variable were found to cause a 37 percent increase in Affective Commitment. Finally, it was found that variations in Benevolent Leadership increased the Normative Commitment by 43 percent and variations in Authoritarian Leadership increased by 16 percent.*

**Keywords:** *Paternalistic Leadership, Trust in Manager, Organizational Commitment.*

**JEL Codes:** M12, M14, M19

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## **1. GİRİŞ**

Mintzberg'in tipolojisine göre profesyonel bürokrasi kapsamında değerlendirilen üniversiteler, yöneticiyle mesafenin daha fazla ve güvenin az olduğu; dolayısıyla diğer örgüt türlerine kıyasla akademisyenlerin bireysel davranışlarına daha fazla imkân veren kurumlardır. Akademisyenlerin iş tanımlarındaki ve rol beklentilerindeki belirsizlikler, akademik faaliyetlerin çoğunun bireysel ve bağımsız doğası, araştırma, öğretme ve idari talepler arasında ortaya çıkabilecek çakışmalar, akademisyenliği, diğer mesleklere kıyasla, daha bağımsız ve özerk çalışmaya elverişli hale getirmektedir. Akademik özgürlük, eleştirel düşünme ve özerklik gibi değerler liderlikle ilişkilendirildiğinde ise ortaya uyum sorunları çıkabilmektedir. Çünkü akademisyenlerin genellikle başkalarına başvurmadan, kendi araştırma faaliyetlerini düzenleme ve belirlemeyle baş başa kalmaları, profesyonelliğin somut bir örneği olup liderin etkisini kısıtlayan bir durumdur.

Konunun bir başka boyutu ise akademik ortamlarda sergilenecek liderlik davranışlarının, toplumsal kültür ile uyumlu olmasıdır. Türkiye gibi kolektivist ve paternalist kültürel değerlere sahip toplumlarda liderden bu değerlere uygun bir liderlik tarzı beklenmektedir. Paternalizmin temel prensipleri, yöneticinin otoritesi ve yol göstericiliği karşılığında, çalışanların ona bağlılık ve saygı göstermesi gerektiğini öğütleyen Konfüçyüs öğretilerine dayanmaktadır. Paternalizm, Uzak Doğu, Latin Amerika ve Orta Doğu toplumlarının kültürel değerleri ile uyumlu olduğundan ve bireylerin hem maddi hem de manevi ihtiyaçlarını karşılamaya devam ettiğinden, bu toplumlarda hala yaygın bir yönetim stratejisi olarak kullanılmaktadır. Bununla birlikte, akademisyenlik mesleğinin kendine has özellikleri açısından değerlendirildiğinde, mesleğin doğası ile paternalist liderliğin farklı boyutları arasındaki uyum, üzerinde durulmaya değer bir konudur. Literatürde bu konuyu tartışan az sayıdaki çalışmada, paternalist liderliğin yardımsever ve ahlaki liderlik boyutlarının, akademisyenlerin çeşitli tutumları üzerinde olumlu etkileri olduğunu; ancak otoriter liderlik boyutunun bu tutumlarla negatif ilişkili olduğunu göstermiştir. Bu çerçevede, bilgi üretme, paylaşma ve yayma görevlerini yerine getiren akademisyenlerin paternalist liderlik algılamalarının, onların iş tutumları üzerindeki etkilerinin saptanmasının ve konunun kültür bağlamında tartışılmasının ilgili literatüre katkı sağlaması umulmaktadır.

## **2. KAVRAMSAL ÇERÇEVE**

Paternalist liderlik, ataerkil düşünceye dayanan, aile içindeki hiyerarşiyi anlatan bir tutum ya da davranış şeklidir. Aile içerisinde ‘baba’ ile sembolleşen bu kavramın temelinde, kendi isteklerini ve menfaatlerini göz ardı edecek şekilde ailenin diğer fertlerinin yararı doğrultusunda kararlar almayı gerektiren fedakârlık, sevgi ve korumacı anlayış yatmaktadır. Bu liderlik yaklaşımında, liderin işyerinde bir aile atmosferi yaratması, izleyenlerine baba gibi yaklaşması, takipçilerinin iş hayatı dışındaki özel hayatları ile ilgilenmesi için her türlü çabayı sarf etmesi gibi konular bulunmaktadır (Erkuş, Tabak ve Yaman, 2010: 594).

Farh ve Cheng (2000:94), paternalist liderliği, “güçlü bir disiplin ve otoriteyi, babacan bir yardımseverlik ve ahlaki bütünlük ile birleştiren liderlik tarzı” olarak tanımlamışlar ve böylece kavramın üç farklı boyuttan oluştuğunu ifade etmişlerdir. Buna göre *otoriter liderlik*, astlar üzerinde mutlak otorite ve kontrol iddia eden ve astlardan sorgusuz itaat talep eden lider davranışlarıdır. *Yardımsever liderlik*, astların kişisel ve aile refahı için bireyselleştirilmiş ve bütüncül bir ilgi gösteren lider davranışlarıdır. *Ahlaki liderlik* ise astların liderle özdeşleşmesini sağlamasının ve astlarda saygı uyandırmasının yanı sıra, meşruiyet sağlayan üstün kişisel erdemler veya nitelikler sergileyen lider davranışlarıdır.

Paternalizm, toplulukçu ve güç mesafesi yüksek kültürlerin değerleri ile uyumludur, çünkü bu kültürlerde paternalist liderin çalışanların kişisel yaşamlarına katılması arzu edilir ve beklenir. Aycan (2001:14) tarafından 10 ülkeden toplam 2003 yönetici ve çalışan üzerinde yapılan geniş kapsamlı araştırmada, paternalizmin en çok gözlemlendiği ülkelerin Hindistan, Pakistan, Çin ve Türkiye olduğu saptanmıştır.

Literatürdeki paternalist liderlik ile ilgili yapılan araştırmalar incelendiğinde, pek çok bireysel ve örgütsel çıktı ile ilişkili olduğu görülmektedir. Örneğin bazı araştırmalarda, paternalist liderliğin yardımseverlik ve ahlak boyutlarının *örgütsel bağlılık* (Farh vd., 2006; Pellegrini ve Scandura, 2008, Duangekanong, Duangekanong, John ve Vikiset, 2017; Ünler ve Kılıç, 2019), *lidere sadakat ve güven* (Cheng, Shieh ve Chou, 2002b; Uhl-Bien vd.,1990), *iş doyumu* (Duangekanong vd., 2017; Ünler ve Kılıç, 2019) ve *örgütsel vatandaşlık davranışlarını* (Cheng, vd., 2002b) ve *iş performansını* (Chou vd., 2005) artırdığı; *işten ayrılma niyetini* (Cheng, Huang ve Chou, 2002a) azalttığı saptanmıştır. Buna karşılık, paternalist liderliğin, özellikle otoriterlik boyutu açısından olumsuz sonuçlara yol açtığını bulan araştırmalar da mevcuttur. Örneğin, paternalist liderliğin çalışanlarda öfkeli duygular uyandırdığı (Wu vd., 2002) ve çalışanların örgütsel bağlılığını azalttığı saptanmıştır (Farh vd., 2006).

Podsakoff ve arkadaşlarına (2000) göre *yöneticiye güven*, “çalışanın yöneticiye olan inancını ve yöneticinin çalışanların yararına hareket edeceğine ilişkin güvenini ifade eder” (Ertürk, 2007: 260). McAllister (1995:26-30), yöneticiye duyulan güven kavramını, bilişsel ve duygusal güven olmak üzere iki alt boyutta incelemiştir. *Bilişsel (cognitive) güven*, karşılıklı ilişkide tarafların bütünlüğü veya kapasitesi gibi konuları yansıtır. *Duygusal (affective) güven* ise bir tarafın, diğerinin refahı için endişelendiğini göstermesini ve yardımseverlik hislerini yansıtmaktadır (Dirks ve Skarlicki, 2004: 12). Ertürk (2007: 261), yöneticiye güven kavramını, bir çalışanın, yöneticisinin kendisine karşı daima açık olacağı ve taahhütlerini yerine getireceği konusunda hissettiği güven olarak tanımlamıştır. Yazara göre, Türkiye gibi paternalist kültürün hâkim olduğu ülkelerde, çalışanlar, yöneticilerinin kendilerini aileden biri gibi görmesini beklemekte ve bu beklentileri karşılanmadığında yabancılaşmaktadırlar.

Yöneticiye güven ile paternalist liderlik ilişkisine yönelik araştırmalar incelendiğinde, paternalist liderliğin, çalışanların yöneticilerine duyduğu güveni artırdığı görülmektedir (Uhl-Bien vd., 1990; Mayer vd., 1995; Cheng, vd., 2002b; Wasti vd., 2011; Wu vd., 2011). Ancak bu olumlu ilişki, daha çok yardımsever ve ahlaki liderlik boyutları açısından geçerlidir. Örneğin Wu ve arkadaşları (2011:111) tarafından yapılan araştırmada, otoriter liderliğin yöneticiye güven üzerinde olumsuz bir etkisi olduğu; fakat yardımsever ve ahlaki liderlik boyutlarının, çalışanların yöneticiye güvenini artırdığı saptanmıştır.

Yönetim literatüründe en çok araştırılan ve farklı değişkenlerle ilişkisi incelenen kavramlardan biri de *örgütsel bağlılıktır*. Meyer ve Allen (1997: 11) psikolojik bir boyuta sahip olduğunu belirttikleri ve üç boyutlu bir kavram olarak ele aldıkları örgütsel bağlılığı, “çalışanların örgütle ilişkisi ile şekillenen ve onların örgütün sürekli bir üyesi olma kararını almalarını sağlayan davranış” olarak tanımlamışlardır. Buna göre *duygusal bağlılık*, bir bireyin kendisini örgütüyle özdeşleştirdiği, örgütüyle etkileşim halinde olduğu ve örgütün bir üyesi olmaktan mutlu olduğu duygusal bir yönelme durumudur (Allen ve Meyer, 1990: 2). *Devamlılık bağlılığı*, çalışanların, örgütten ayrılmalari durumunda sahip oldukları yatırımları ve yan-faydaları kaybedeceklerine inanmaları ve iş alternatiflerinin sınırlı olduğunu dikkate almaları sonucu ‘zorunlu olarak’ o örgütte çalışmaya devam etmeleridir (Meyer vd., 1993: 539). *Normatif bağlılık* ise örgüt üyeliğinin sürdürülmesi konusunda çalışanların hissettiği yükümlülük duygusudur (Meyer ve Smith, 2000: 320).

Literatürde, paternalist liderlik ile örgütsel bağlılık arasındaki ilişkiyi inceleyen araştırmalara az da olsa rastlanabilmektedir. Bu araştırmalarda paternalist liderliğin özellikle yardımsever ve ahlaki liderlik boyutlarının, duygusal ve normatif bağlılığı arttıran önemli faktörler olduğu sonucuna ulaşılmıştır (Farh vd., 2006; Hakimian vd., 2014: 373; Erben ve Güneşer, 2008: 955; Pellegrini ve Scandura, 2008; Rehman ve Afsar, 2012: 148; Duangekanong vd., 2017: 56; Çakıcı ve Burak, 2019: 339; Ünler ve Kılıç, 2019: 1).

Literatürde, paternalist liderliğin doğrudan akademisyenler üzerindeki etkisini araştıran çalışmalar kısıtlıdır. Bununla birlikte, örgütsel bağlılık ve yöneticiye güven gibi değişkenlerin akademisyenlerden oluşan örneklemeler üzerinde test edildiği araştırmalara rastlanabilmektedir (örneğin, Ertürk, 2007; O’Sullivan, 2016, Özmen vd., 2005). Ertürk (2007: 265), topluma hâkim olan paternalist ve kolektivist kültür bağlamında, yöneticiye güvenin Türk akademisyenlerin örgütsel vatandaşlık davranışları üzerinde en güçlü etkiyi yaptığını vurgulamıştır.

Özetle, akademisyenliğin kendine özgü bazı özellikleri bulunduğu ve bunun, bu meslekteki bireylere liderlik yapmayı zorlaştırdığı söylenebilir. Öte yandan, Türkiye gibi kolektivist ve paternalist kültürel değerlere sahip olan toplumlarda liderden bu değerlere uygun bir liderlik tarzı beklenir. Bu bağlamda, paternalist liderliğin yardımsever ve ahlaki liderlik boyutlarının, akademisyenlerin duygusal ve normatif bağlılıkları ile yöneticiye duydukları güveni olumlu yönde etkilemesi beklenebilir. Buna karşılık, otoriter liderlik boyutunun akademisyenlik mesleğinin doğası ile örtüşmediği ve uyum sorunları yaşanabileceği düşünülmektedir.

## **2. ARAŞTIRMA**

Çalışmada, akademisyenlerin paternalist liderlik algılarının, onların örgütsel bağlılığını ve yöneticiye güven duygularını ne yönde etkileyeceğini tespit etmek amacıyla bir Survey araştırması tasarlanmıştır.

Araştırma, İzmir ilindeki iki büyük devlet üniversitesinde, toplam 10 fakültede görev yapan 200 akademisyen ile gerçekleştirilmiştir. Verilerin toplanmasında, üniversite öğrencilerinden oluşan bir anketör ekibi oluşturulmuş ve öğrencilerin, tesadüfi olarak belirlenen fakültelere giderek akademisyenleri odalarında ziyaret etmeleri ve 'kapalı-zarf' usulü ile araştırmaya katılmaya davet etmeleri yoluna başvurulmuştur.

Araştırmada, orijinali Çince olan ve Cheng, Chou ve Farh (2000) tarafından geliştirilen *Paternalist Liderlik Ölçeği*'nin Çıraklar, Uçar ve Sezgin (2016) tarafından Türkçe'ye uyarlanan formu kullanılmıştır. Duygusal ve Normatif Bağlılık, Meyer, Allen ve Smith (1993) tarafından geliştirilen *Üç Boyutlu Örgütsel Bağlılık Anketi*'nin Wasti (2000) tarafından Türkçe'ye uyarlaması yapılan formu kullanılarak ölçülmüştür. Yöneticiye güveni ölçmek için ise McAllister (1995) tarafından geliştirilen *Kişilerarası Güven ölçeğinin* Bilişsel ve Duygusal Güven alt boyutlarından 5 maddelik *Duygusal Güven Ölçeğinin* Doğan (2019:82) tarafından Türkçe'ye çevrilen formu kullanılmıştır.

Analiz aşamasında öncelikle araştırmada kullanılan soru formlarının geçerlilik ve güvenilirlik analizleri yapılmıştır. Daha sonra, katılımcıların paternalist liderlik algılarının, duygusal ve normatif bağlılık ile yöneticiye duygusal güven üzerindeki etkilerini test etmek üzere aşamalı (stepwise) regresyon analizi yapılmıştır.

Araştırmaya katılanların yüzde 44'ü kadın, yüzde 56'sı erkek olup aynı zamanda yüzde 46'sı bekar, yüzde 54'ü evlidir. Yaşlara göre dağılımları incelendiğinde, yüzde 50'sinin 25-34 yaş aralığında olduğu; yüzde 35'inin ise 35-44 yaş aralığında olduğu saptanmıştır. 45 yaş ve üzerinde ise 30 katılımcı (yüzde 15) bulunmaktadır. Katılımcıların eğitim düzeylerine göre dağılımlarına bakıldığında, yüzde 63'ünün doktora derecesine sahip olduğu görülmüştür. Yüzde 30'u ise yüksek lisans derecesine sahip olup doktorasına devam eden akademisyenlerden oluşmaktadır. Benzer şekilde, 13 katılımcı da (yüzde 6,5) lisans derecesine sahip olup yüksek lisans eğitimini sürdürmektedir. Son olarak, araştırmaya katılanların çalışma sürelerine göre dağılımları incelendiğinde, yüzde 57'sinin 1 ile 5 yıl arası çalışma deneyimine sahip olduğu; yüzde 35'inin ise 10 yıldan fazla bir süredir çalışma yaşamında olduğu saptanmıştır.

Paternalist Liderlik ölçeği için yapılan güvenilirlik analizinde, Ahlaki Liderlik boyutundan bir madde (AL1), iç tutarlılığı düşürdüğü için analizden çıkarılmış ve ölçeğin toplam güvenilirliği .737'den .762'ye yükselmiştir. Kaiser-Meyer-Olkin örneklem uygunluğu (KMO= .936) ve Bartlett Küresellik (3600.902, p=.000) testleri, ölçeğin faktör analizi yapmaya uygun olduğunu göstermiştir. İlk iterasyonda Otoriter Liderliğe ait sekizinci madde (OL8); ikinci iterasyonda ise Ahlaki Liderlik



ölçeğine ait üçüncü madde (AL3) hiçbir faktöre yüklenmedikleri için analizden çıkarılmıştır. Analiz sonucunda Paternalist Liderlik Ölçeğinin, orijinal ölçekte olduğu gibi üç boyutlu olduğu saptanmıştır. Diğer taraftan, Ahlaki Liderlik ölçeğinin ikinci maddesi (AL2), Yardımsever Liderlik faktörüne yüklenmiştir. Paternalist Liderlik Ölçeğine ilişkin KMO testi değeri .937, Bartlett testi değeri (3428.805)  $p=.000 < .05$  önem düzeyinde anlamlıdır. Yardımsever, Otoriter ve Ahlaki Liderlik boyutlarının varyansı açıklama yüzdeleri sırasıyla yüzde 30, 23 ve 13'tür. Yüzde 50'den yüksek olması istenen kümülatif yüzde değeri ise 66,71 olarak bulunmuştur. Yeni faktör yapısına göre yapılan güvenilirlik analizi sonuçlarına göre Yardımsever Liderlik boyutunun Cronbach Alfa değeri .95, Ahlaki Liderliğin .76 ve Otoriter Liderliğin .92 olarak bulunmuştur. Paternalist Liderlik Ölçeğinin toplam güvenilirlik katsayısı ise .73'tür.

Araştırmanın bağımlı değişkenleri olan Duygusal bağlılık, Normatif Bağlılık ve Yöneticiye Duygusal Güven ölçekleri için yapılan faktör analizleri sonucunda, Duygusal Bağlılık ölçeği için iki boyutlu bir yapı ortaya çıkmıştır. Normatif Bağlılık ve Yöneticiye Duygusal Güven ölçekleri ise tek boyutludur. Üç değişken için de KMO ve Bartlett test değerleri uygun olup  $p=.000 < .05$  düzeyinde anlamlıdır. Duygusal Bağlılığın açıklanan kümülatif varyans oranı %76, Normatif Bağlılığın %53 ve Yöneticiye Duygusal Güvenin %79'dur. Bağımlı değişkenler için Cronbach Alfa katsayıları incelendiğinde ise Duygusal Bağlılık için .83, Normatif Bağlılık için .80 ve Yöneticiye Güven için .93'tür. Bu bağlamda tüm değişkenlerin maddeleri arasında iç tutarlılığın bulunduğu sonucuna ulaşılmıştır.

Paternalist liderlik boyutlarının, duygusal ve normatif bağlılık ile yöneticiye duygusal güven üzerindeki etkilerini test etmek amacıyla SPSS 24.0 programı ile Aşamalı (Stepwise) Regresyon analizi yapılmıştır. Yöneticiye Duygusal Güven için yapılan analiz sonucunda, modele Paternalist Liderliğin öncelikle Yardımsever Liderlik boyutu ve daha sonra da Otoriter Liderlik boyutu girmiştir (Tablo 1). Ahlaki Liderlik boyutu ise modelde yer almamıştır ( $p<.05$ ). Bu modelin Yöneticiye Güven üzerindeki varyasyonların yüzde 71'ini ( $R^2$ ),  $P=.000$  önem düzeyinde açıkladığı görülmektedir. Regresyon katsayılarına ( $\beta$ ) bakıldığında ise, yardımsever liderliğin yöneticiye güveni .65 artırdığı ( $p=.000$ ); aynı anda otoriter liderliğin yüzde 29 azalttığı ( $p=.000$ ) saptanmıştır.

**Tablo 1. Paternalist Liderliğin Bağımlı Değişkenler Üzerindeki Etkisi**

Modele Giren Bağımsız Değişkenler	Bağımlı Değişken	
	Yöneticiye Duygusal Güven	
	$\beta$	p
Yardımsever Liderlik	.653	.000

<b>Otoriter Liderlik</b>	-.292	.000
Adj. R <sup>2</sup> = .71      F =223.002      P =.000		
<b>Duygusal Bağlılık</b>		
	$\beta$	p
<b>Yardımsever Liderlik</b>	.418	.000
Adj. R <sup>2</sup> = .17      F =38.186      P =.000		
<b>Normatif Bağlılık</b>		
	$\beta$	p
<b>Yardımsever Liderlik</b>	.433	.000
<b>Otoriter Liderlik</b>	.187	.024
Adj. R <sup>2</sup> = .127      F =14.156      P =.000		

Duygusal Bağlılık için yapılan Regresyon analizi sonucunda, denkleme Paternalist Liderliğin yalnızca Yardımsever Liderlik boyutu girmiştir. Bu model Duygusal Bağlılık üzerindeki varyasyonların yüzde 17'sini P=.000 önem düzeyinde açıklamaktadır.  $\beta$  katsayısına bakıldığında ise Yardımsever liderliğin duygusal bağlılığı .42 artırdığı görülmektedir (p=.000).

Normatif Bağlılık değişkeni için yapılan analize göre, modele Yardımsever Liderlik ve Otoriter Liderlik boyutlarının girdiği saptanmıştır. Bu modelin Normatif Bağlılık üzerindeki varyasyonların yüzde 12'sini P=.000 önem düzeyinde açıkladığı görülmektedir. Ayrıca yardımsever liderliğin normatif bağlılığı yüzde 43 (p=.000) ve otoriter liderliğin ise yüzde 18 artırdığı (p=.024) saptanmıştır.

### 3. SONUÇ VE TARTIŞMA

Analiz sonuçlarına göre Paternalist liderliğin Yardımsever ve Otoriter Liderlik boyutlarının Yöneticiye Duygusal Güven değişkeninin önemli bir belirleyicisi olduğu saptanmıştır. Aynı değişkenlerin, daha düşük bir oranda olmakla birlikte Normatif Bağlılık değişkenini de yordadığı görülmüştür. Diğer yandan, duygusal bağlılığın, paternalist liderliğin sadece yardımsever liderlik boyutundan etkilendiği ortaya çıkmıştır. Örgüte karşı duygusal bir bağ hissetmeyi ve kişinin kendi arzusu ile, sevdiği için örgütünde kalmak istemesini ifade eden Duygusal bağlılığın, liderin sadece yardımsever tutumlarından etkilenmesinin beklenen bir sonuç olduğu ve bu sonucun, daha önce açıklanan araştırma sonuçlarını (Farh vd., 2006; Hakimian vd., 2014; Erben ve Güneşer, 2008; Pellegrini ve Scandura, 2008; Duangekanong vd., 2017; Çakıcı ve Burak, 2019) desteklediği söylenebilir.

Diğer taraftan, bu çalışmada, paternalist liderliğin ahlaki liderlik boyutunun, araştırmanın değişkenleri üzerinde anlamlı bir etkiye sahip olmadığı; ayrıca otoriter liderliğin, beklenen aksine, duygusal bağlılığı yordayan modelde yer almadığı saptanmıştır. Son olarak, otoriter liderliğin, varsayıldığı üzere normatif bağlılığı azaltmadığı; tam tersine artırdığı tespit edilmiştir. Özetle,

yardımsaver liderliğin, araştırmanın tüm bağımlı değişkenlerini artırdığı; otoriter liderliğin ise yöneticiye duygusal güveni azalttığı tespit edilmiştir.

Mevcut araştırma sonuçlarının, literatürde yer alan araştırma sonuçlarından genel anlamda farklı olmasının, akademisyenlik mesleğinin doğasından kaynaklandığı düşünülmektedir. Daha önce belirtildiği üzere, üyelerinin bireysel faaliyetlerine daha fazla imkân veren bir meslek olan akademisyenlikte, bireylerin profesyonellik düzeylerinin yüksek olması nedeniyle yöneticinin liderlik yapmasına veya yol göstermesine gereksinimleri, başka mesleklere kıyasla daha düşük olabilmektedir. Diğer taraftan, konuya toplumsal kültür açısından yaklaşıldığında, Türkiye’de iş yaşamında paternalist liderlik beklentisinin günümüzde, Y kuşağı da dâhil olmak üzere devam ettiği görülmektedir (Aktaş ve Sargut, 2011; Gürcan, 2018; Gelmez ve Akça Ertürk, 2019; Tolay, 2020). Bu beklentinin akademisyenler açısından da geçerli olup olmadığını inceleyen mevcut araştırmanın sonuçlarının bu düşüncüyü önemli ölçüde desteklediği görülmüştür. Nitekim araştırmaya katılanların, yöneticilerin ‘yardımsaver liderlik’ tarzındaki davranışlarından etkilendikleri ve bu doğrultuda duygusal ve normatif bağılıklarının yanı sıra yöneticilerine duygusal güvenlerinin arttığı ortaya çıkmıştır. Ahlaki liderliğin, katılımcıların tutumları üzerinde herhangi bir anlamlı etkisinin olmaması ise bu tür davranışların, bir liderde olması gereken özellikler olduğu; dolayısıyla akademisyenlerin güven ve bağılılık tutumlarında olumlu veya olumsuz bir etkisinin bulunmamasına dayandırılabilir.

Paternalist liderliğin, araştırma değişkenleri içerisinde özellikle Yöneticiye Duygusal Güveni güçlü bir şekilde etkilediği bulgulanmıştır. Bu sonuç, Ertürk (2007: 266-267) tarafından yapılan araştırmanın sonucunu desteklemektedir. Yazar, Türkiye bağlamında yöneticiye güvenin, diğer yönetsel ve tutumsal faktörler içerisinde kritik bir role sahip olduğunu belirtmiş ve bu nedenle üniversitelerde bölüm yöneticilerinin ve üst yönetimin, güveni belirleyen faktörleri anlamalarını ve bu faktörlerin olumlu etkilerini güçlendirmek için gerekli önlemleri almalarını önermiştir. Öte yandan, araştırmadan elde edilen bir diğer bulgu, otoriter liderliğin, yöneticiye duygusal güveni azalttığı yönündedir. Bu sonuç da literatürdeki çalışmaları (örneğin Korkut, 1992) desteklemektedir.

Sonuç olarak, üniversitelerdeki akademik liderler ve araştırma liderlerinin, akademisyenlerle ilişkilerinde karşılıklı güveni artırmaya yönelik davranışlara ağırlık vermeleri ve bunu yaparken otoriter tutumlardan kaçınmaları; tam tersine ‘ailenin bir üyesi’; bir ‘baba’ gibi davranmaları ve onların aile ve özel yaşamları ile ilgilenmeleri ve gerek iş gerekse özel yaşamlarındaki sorunlarında destekleyici ve yol gösterici rollerini sürdürmeleri önerilebilir.

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## **ORTAKLAŞA REKABETİ ANLAMAK ÜZERE BİR ARAŞTIRMA ÖRNEĞİ**

**Eren DURMUŞ-ÖZDEMİR<sup>1</sup>**

<sup>1</sup>Akdeniz Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, Antalya, Türkiye, [edurmus@akdeniz.edu.tr](mailto:edurmus@akdeniz.edu.tr), 0000-0002-0077-9363

### **ÖZET**

*Çalışmanın amacı rekabet ve işbirliği arasındaki ilişkiyi ortaklaşa rekabetin arka planındaki gerekçeler çerçevesinde irdelemektir. Ortaklaşa rekabet iki ya da daha fazla firma arasında meydana gelen rekabet ve işbirliğinde karşılıklı bağlılığa dayanan ilişkilerin bütünü olarak tanımlanmaktadır. Zira günümüzde küresel rekabetin artmasıyla birlikte giderek artan stratejik işbirlikleri, büyüme maliyetlerinin yüksek olması, inovasyona yönelik ilerlemeler, finansal piyasalardaki belirsizlikler ve rakiplerin birbirini tamamlayacak kaynaklara sahip olması firmalar arasında eş zamanlı rekabet ve işbirliği ilişkilerinin gelişmesine neden olabilmektedir. İlişkiler düzeneğinin firmalara kimi zaman rekabet üstünlüğü ve/veya normalin üzerinde performans elde etme imkânı sunduğu, kimi zaman da bir takım sorunlar oluşturduğu gözlemlenmiştir. Buradan hareketle çalışmada Antalya'nın üç farklı destinasyonunda faaliyet gösteren 6 adet beş yıldızlı otelin üst düzey yöneticileri ile derinlemesine görüşmeler gerçekleştirilmiştir. Araştırmanın sunduğu tespitler -veri toplama sürecindeki sınırlılıkların oldukça fazla olması nedeniyle- genelleştirilememesine rağmen, otel işletmeleri arasında belirli alanlarda ortaklaşa rekabet uygulamalarının varlığına ve avantajlarına dair zayıf sinyaller sunmuştur.*

**Anahtar Kelimeler:** Ortaklaşa Rekabet, Rekabet, İşbirliği, Otel İşletmeleri

**JEL Kodları:** C7, C70, L10

**A RESEARCH EXAMPLE TO UNDERSTAND COOPETITION**

**Eren DURMUŞ-ÖZDEMİR<sup>1</sup>**

<sup>1</sup>Akdeniz Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, Antalya, Türkiye, edurmus@akdeniz.edu.tr, 0000-0002-0077-9363

**Abstract**

*The purpose of the study is to examine the relationship between competition and cooperation within frame of reasonings at the background of coopetition. Coopetition is defined as all of the relationships based on mutual commitment in relation to competition and cooperation that take places between two or more numbers of firms. Hence nowadays, the increasing strategic alliances with increasing global competition, the high growth costs, progress towards innovation, uncertainties in financial markets and competitors having resources to complement each other can cause for simultaneous competition and cooperation relations to develop among the firms. It has been observed that this network relation sometimes provides competitive advantage and/or performance above normal levels in relation to firms and that it sometimes causes certain problems to arise. Starting from this point on, in depth interviews have been realized with six top level managers of five star hotels operating at three different destinations in Antalya. Findings obtained with the research have provided certain signals even though weak, with regards to the presence and advantages of coopetition practices among hotel enterprises in relation to certain areas, even though they could not be generalized due to the reason that limitations during data collection process were quite a lot.*

**Keywords:** Coopetition, Competition, Cooperation, Hotel Businesses

**JEL Codes:** C7, C70, L10

**1. GİRİŞ**

Dijital dönüşüm süreci ile birlikte küresel rekabette oyun kuralları değişmeye başlamış, hareket alanları daralan firmaların kendi kaynakları ve yetkinlikleriyle ekonomik faaliyetlerini gerçekleştirmesi zorlaşmaya başlamıştır. Bu süreçte firmalar maliyetlerini paylaşmak, rekabet risklerini azaltmak ve ölçek ekonomisi ile tasarruf elde etmek niyeti ile çeşitli formlarda işbirliği ilişkilerini tercih etmiştir. Firmalar arası işbirliği ilişkilerinin amacı tarafların bilhassa rekabetin yoğun olduğu pazarlarda üstün konum elde ederek performans artışını sürdürülebilir kılmaktır. Böylece aynı sektördeki firmalar arasında eş zamanlı rekabetçi ve işbirlikçi ilişkiler ağı gelişebilmektedir. İki rakip firmanın aynı faaliyet alanlarında birbirleriyle rekabet ettiği ve aynı zamanda diğer faaliyet alanlarında işbirliği yaptığı bir ilişki ağı olarak tanımlanan “ortaklaşa rekabet” (coopetition) ilişkiye taraf olan firmaların geliştirdikleri davranış biçimlerine bağlı olarak kimi zaman performans artışı sağlayabilmekte (Baumard, 2009) kimi zaman çeşitli nedenlere bağlı olarak (örneğin temel yeteneğin



kopyalanması gibi) performansı negatif etkileyebilmektedir (Luo, 2007a: 132; Gnyawali vd. 2006). Stratejik yönetim alan yazınında birçok araştırmmanın ortaklaşa rekabete dair uygulamaları farklı açılardan ve/veya kavramsal düzeyde tartıştığı gözlemlenmiştir. Keşfedici nitelikte olan bu çalışma örneği ile firmaların ilişki ağlarını oluşturma nedenlerine dair bulguların ilgili alan yazına kavramsal düzeyde ipucu sunması umulmaktadır. Bu amaçla araştırma sorusuna Antalya'nın üç farklı destinasyonunda faaliyet gösteren 6 adet beş yıldızlı otelin üst düzey yöneticileri ile derinlemesine görüşmeler gerçekleştirilerek cevap/lar aranmıştır.

## **2. KAVRAMSAL ÇERÇEVE**

Ortaklaşa rekabet kavramı ilk kez 1980'lerde ABD'de çok uluslu yazılım şirketi olan Novell'in üst düzey yöneticisi Raymond John Noorda tarafından rekabet (competition) ve işbirliği (cooperation) kavramlarının birleştirilmesi ile kullanılmaya başlanmıştır. Temelde iki ya da daha fazla firmanın eş zamanlı olarak aynı /bazı faaliyetlerinde birbirleriyle rekabet ederken, diğer faaliyetlerinde işbirliği yapması olarak tanımlanan ortaklaşa rekabet, firmalar arasındaki karşılıklı bağlılığa dayanan işbirlikçi çıkmazdır (cooperative dilemma) (Bengtsson ve Kock, 2000: 412; Zeng 2003: 96 ; Luo, 2007: 130). Yani firmalar işbirliği ile değer oluşturmakta rekabet ile bu değeri paylaşmaktadır. Bowser'a (2016) göre ortaklaşa rekabet ilişki ağı içinde yer alan tüm paydaşlara amaçlarına yönelik maksimum değerini sunulmasıdır. Gulati vd.'e göre (2000: 204) işbirliği ağı fırsatların ve sınırlılıkların kaynağı olabilmekte, ağı taraf olan firmalar rekabetin doğasını etkileyebilmektedir. Rekabetçi ilişki ağlarının birden fazla boyutu olarak ortaklaşa rekabet, firmalar arasında karşılıklı bağlılığa dayanmaktadır. Bağlılığın yarattığı durum ile firmalar yeni pazarlar oluşturmak ve/veya geliştirmek ile ilgili maliyetleri ve olası tüm riskleri azaltabilme fırsatı yakalayabilmektedir. Kaldı ki son yıllarda işletmeler uluslararası pazarlarda küresel rakipleri karşısında inovasyon performanslarında başarı elde edebilmek için ortaklaşa rekabete yönelebilmektedir. Benzer biçimde küresel düzeyde rekabet üstünlüğüne sahip firmalar ortaklaşa rekabete yönelik işbirlik stratejileri ile bilhassa yeni coğrafi pazarlara erişime yönelik belirsizlikleri azaltabilmektedir. Yanısıra ortaklaşa rekabete dair süreç kimi zaman firmalar açısından olumsuz neticeler de ortaya çıkabilmektedir. Örneğin Luo'a (2007) göre rakipler arasındaki kaynaklara dair bağımlılık ilişkisi (örneğin inovasyona bağımlılık) işbirliği sonlandıktan sonra tarafların rekabetçi konumlarını yitirmelerine neden olabilmektedir. Konu ile ilgili alan yazında çeşitli araştırmalar rekabetçi işbirliğinden kaynaklı avantajlardan bahsetmektedir (Bengtsson ve Kock, 2000; Ma, 2004; Sönmez ve Eroğlu, 2018). Buradan hareketle çalışmada ortaklaşa rekabete dayalı uygulamaların arka planındaki gerekçeler ve varsa bu uygulamalara ilişkin avantajlar keşifsel nitelikli bir alan araştırması ile sorgulanmıştır.

### **3. ARAŞTIRMA YÖNTEMİ**

Alan araştırması Antalya'nın üç farklı destinasyonunda (Kundu, Belek ve Tekirova) faaliyet gösteren 6 adet beş yıldızlı otelin üst düzey yöneticileri ile derinlemesine görüşmeler yoluyla yürütülmüştür. Veriler mevcut çalışmanın yazarı tarafından hazırlanan bir görüşme formu aracılığı ile toplanmıştır. Görüşme formunun hazırlık aşamasında ilgili alan yazında yer alan araştırmalardan ve sektörde yer alan uzman kişilerle gerçekleştirilen görüşmelerden yararlanılmıştır. Haziran –Eylül 2019 tarihleri arasında gerçekleştirilen görüşmeler işletmelerin veri gizliliği politikaları gereği elle not tutularak kayıt altına alınmıştır. Görüşmelerden elde edilen veriler içerik analizi ile değerlendirilmiştir.

### **4. BULGULAR VE DEĞERLENDİRME**

Keşifsel amaçlı gerçekleştirilen araştırmada dikkat çeken ilk bulgu aynı destinasyonda yer alan oteller arasında ortaklaşa rekabete dayalı uygulamaların arka planında yatan gerekçelerden birinin oda fiyatları olduğudur. Görüşme yapılan Katılımcı A.K. konuyla ilgili olarak «....*Rakibimiz ile işbirliği yapmak kulağa pek hoş gelmeyebilir. Hatta belki bilimsel karşılığı bile olmayabilir. Ama turizm bambaşka bir sektör. Rakibinizle kol kola olmanız gerekiyor. Özellikle aynı segmentte ve aynı bölgede iseniz özellikle oda fiyatları konusunda centilmence anlaşma yapmanız gerekebiliyor.....*» ifadeleri ile sözleşme olmaksızın ortaklaşa rekabete dayalı uygulamalardan bahsetmiştir. Benzer açıklamalarda bulunan diğer yönetici S.D ise şu ifadelerde bulunmuştur:

«...*Bölgemizin adı Kundu. Etrafınıza bir bakın lütfen. Komşuculuk oynamak için yan yanayız adeta. Çoğu zaman XXX oteller zincirinin satış yöneticisi ile öğlen yemeklerinde biraraya geliyoruz. Gelir yönetimlerimiz hakkında mütalaa yapıyoruz. Örneğin geçen ay otelimiz tam kapasite çalışırken, mevcut misafirlerimizi kaybetmemek için yandaki otele müşterilerimizi aynı fiyattan yönlendirdik. Ve tabii fiyatlar konusunda yazılı olmasa da aramızda ara sıra işbirliğine gidebiliyoruz. Komik gelebilir belki ama komşu olarak birbirimize muhtacız bir anlamda. Neden dersiniz..Online satış şirketleri bizi yok etmeden biz yazılı olmasa da güvende birleşmeliyiz diye düşünüyoruz..Tabii tek bir çatı altında değil..Neticede bizler hep birbirimizin rakibiyiz...».*

Araştırma kapsamında yer alan beş yıldızlı otel yöneticilerinin oda fiyatları hususunda yazılı olmasa da güvene dayalı işbirliği eğilimleri oldukları gözlemlenmiştir. Son yıllarda konaklama sektöründe online satış ve pazarlama kanallarının yarattığı rekabet baskısı ve aynı bölgede güçlü uzmanlığa sahip ulusal/küresel rakiplerin mevcudiyeti yöneticileri işbirliği ilişkisine yöneltmiş olabileceği düşünülmektedir. Araştırmanın göze çarpan diğer bulgusu ise yöneticilerin operasyonel uygulamalar ve hukuki gerekçeler ile ortaklaşa rekabet uygulamalarına yöneldikleridir. Bu tespiti yönelik seçilmiş örnek görüşme deşifreleri şunlardır:

«...Aynı bölgedeki insan kaynakları müdürleri iletişim kurarlar ve ortalama zam aralığını birlikte belirlerler....”(Katılımcı D.M).

«....Otelcilerin aşına olduğu konu «politik, ekonomik ya da ekolojik krizler» karşısında gelişebilecek oda iptalleridir. Bu nedenle bizler satışta zarar etmemek için rezervasyonları kapasitenin biraz üstünde alırız. Ancak bazen hiç iptal gelmez ve bu durumda otel kapasitesini aşabilir. Nadiren de olsa biz böyle bir durumda misafirimizi yanımızdaki lokasyonda bulunan ve rakibimiz olan Y Otelinde ağırlamaktan çekinmeyiz. Hatta biz misafirimize neyi taahhüt ettiysek işbirliğinde olduğumuz rakibimizden bunları sunmasını da talep edebiliriz.. Çünkü onlardan da benzer durum bize yansıyabilir. O anki krizi çözmek ve misafirlerimizi zor durumda bırakmamak için yoğun sezonda uyguladığımız ortak çözüm yöntemi diyebilirim...”(Katılımcı M.E).

“.....Belek demek golf turizmi demek. İşte tam bu noktada işbirliği şart. Çünkü golf turizmini bizden öğrenen rakiplerimiz ve güçlü iş ortaklarımız ile yeni bir Pazar alanı yarattık. Böylece pek çok sahaya yönelik işlerimizdeki maliyetlerimiz düştü. Yansırı bölgesel düzeyde kalkınmaya da sebep olduk diye düşünüyorum...”(Katılımcı G.B.).

«.....gelir yönetimimizi düşürmek için birbirimize güvenme zamanı. Özellikle bilgi alışverişinde işbirliği yapıyoruz. Örneğin komşumuz olan rakip otel ile işbirliğimiz neticesinde ekolojik uygulamalar yaparak maliyetlerimizi düşürmeyi planlıyoruz. Dev güneş panelleri yaptıracağız....”(Katılımcı Y.O).

«....hukuki anlamda bahsettiğiniz işbirliğinin faydası yadsınamaz. Mesela reklamasyon davaları... Otel yarım, ayıplı hizmet sunuyorsa misafir para iadesi, tazminat gibi hakları olduğunu bilerek hukuki süreç başlatabiliyor. Ve bazı misafirlerimiz bu haklarını çok kolay suiistimal edebiliyor maalesef. Burada otellerin -eğer haklıysa tabi- iyi bir savunma yapmaları, lehte emsal gösterilen davaları bilmeleri önemli. Reklamasyon ortak hareket ettiğimiz bir alandır..”(Katılımcı D.M).

Araştırma kapsamında tespit edilen son bulgu ise yöneticilerin ortaklaşa rekabetin beş yıldızlı otellere performans artışı sağlayabileceği yönündeki algıları olmuştur. Bu çıkarıma yönelik iki yöneticinin ham görüşme ifadeleri şu şekilde olmuştur:

«....Az önce de bahsettiğim gibi: oyunda tek olmayı arzu ediyorsanız, finansal yapınız ve sosyal ağlarınız yıkılmaz olmalı. O yüzden bizler rakiplerimizle bazı noktalarda el sıkışıyoruz....”(Katılımcı G.B.).

«.....İşbirliği ister yazılı ister centilmence sözlü olsun..Çok net : Performans artışını gözlemliyoruz....» (Katılımcı M.E).

Özetle bulgular araştırmaya dahil olan yöneticilerin ortaklaşa rekabete dayalı uygulamalara -birtakım gerekçelere bağlı- eğilimlerini ve bu uygulamalar ile işletmelerinin performans artışı elde ettiğine/edeceğine dair algıları olduğunu ortaya koymuştur. Bilhassa yöneticilerin tamamı otellerinin açık olduğu yoğun dönemlerde müşteri bağımlılığını yitirmemek, odaya göre kapasite kullanım oranlarını yükseltmek ve online satışlara karşı rekabet edebilmek için oda fiyatları konusunda güvene dayalı rekabetçi işbirliğinde bulunduklarını ifade etmişlerdir. Yanısıra birtakım operasyonel uygulamalar ve hukuki gereklilikler de ortaklaşa rekabete neden olabilmektedir. Bu bulgular Dabanlı'nın (2010) “*Konaklama İşletmelerinde Ortaklaşa Rekabetin Uygulanabilirliği: Kapadokya Bölgesi'nde Bir Araştırma*” başlıklı yüksek lisans tez araştırmasının bulguları ile örtüşmektedir. Dabanlı'nın (2010) araştırmasına göre otel üst düzey yöneticilerinin büyük bir çoğunluğu işbirliği ve rekabetin birlikte kullanılarak işletmeye bir takım avantajlar sağlayacağı yönünde ortak görüşe sahiptir. Mevcut araştırma sonuçları özellikle aynı lokasyonda bulunan beş yıldızlı otel yöneticilerinin fiyat rekabetine karşı güçlü rakiplerine karşı direnci azaltmak, müşteri bağımlılığını yitirmemek, reklamasyon sorunlarına dair bilgi paylaşımında bulunmak, online satış kanallarında yer alan rakiplerine karşı üstünlük kazanmak, hizmet kalitesine yönelik olumsuz bir algı yaratmamak için rekabetçi işbirliğine girişme eğilimlerine işaret etmiştir. Araştırmanın veri toplama sürecinde yöneticilerin güvene dayalı işbirliği ile daha yoğun ilişkiler geliştirebilecekleri gözlemlenmiştir. Araştırmanın sunduğu tespitler -veri toplama sürecindeki sınırlılıkların oldukça fazla olması nedeniyle- genelleştirilememesine rağmen, otel işletmeleri arasında belirli alanlarda ortaklaşa rekabet uygulamalarının varlığına ve avantajlarına dair zayıf da olsa birtakım sinyaller sunmuştur. Keşfedici nitelikte olan bu çalışma örneği ile firmaların ilişki ağlarını oluşturma nedenlerine dair bulguların ilgili alan yazına kavramsal düzeyde ipucu sunması umulmaktadır

## **TEŞEKKÜR**

Araştırmanın veri toplama sürecinde uzmanlık bilgilerine dayanan teknik desteklerinden dolayı Corendon Hotels&Resorts Global Satış Direktörü Sayın Murat Durmuş'a, Antalya Büyükşehir Belediyesi Elektrik Mühendisi Sayın Hande Balkan Turan'a, ve Liberty Hotels Lara Satış Müdürü Sayın Eren Turan'a çok teşekkür ederim.

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**THE RELATIONSHIP BETWEEN CURRENT ACCOUNT DEFICIT AND  
SELECTED MACROECONOMIC INDICATORS: THE CASE OF TURKEY**

**Cécé Charles LAMAH <sup>(1)</sup>, Fatih AYHAN <sup>(2)</sup>**

<sup>1</sup> MSc. Student, Bandırma Onyedi Eylül University, Balıkesir, Turkey, lamahgodlove89@gmail.com , <https://orcid.org/0000-0001-6006-2021>

<sup>2</sup> Assoc.. Prof., Bandırma Onyedi Eylül University, Balıkesir, Turkey, fayhan@bandirma.edu.tr, Orcid: <https://orcid.org/0000-0002-7447-5506>

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**ABSTRACT**

*The high current account deficit in recent years is seen as one of the most important macroeconomic problems of Turkey. Although there are different reasons for the causes of the current account deficit in the theoretical literature, the applied analyzes reveal different relationships between the current account deficit and macroeconomic variables. The following study aims to investigate the impact of consumer price index, real exchange rate and interest rate on the current account deficit in Turkey by using the monthly time series data from 2006:1 to 2019:7. The hypothesis is tested by using the unit root test which allows to apply the bound testing for the cointegration of the variables then the error correction model procedure. The empirical results suggest that a long run and short run approve the cointegration between the variables, Toda Yamamoto causality test indicate that there exist a bidirectional causality between current account deficit and the interest rate, and a unidirectional causality from (1) consumer price index to interest rate, (2) consumer price index to real exchange rate, (3) interest rate to real exchange rate.*

**Keywords:** *Current Account Deficit, Consumer Price, Bound Test, Causality Test and Turkey's Economy.*

**JEL Codes:** *F14, F32, F41, M37*

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**1. INTRODUCTION**

The current account is the precious factor that includes the payment of goods and services plus the investments incomes and transfers between a private economy and remaining the world. The balance of payments is a vital variable in open economies. The current account balance calculates the current income and payments made between the citizens of a country and those outside the world. (Wanjau, 2014: 97).

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The current account surplus means that the economy is doing significantly well, while the current account deficit is indicative of greater domestic pulling power of aggregate supply compared to income (Henry and Longmore, 2003: 2).

There are several reasons about the current account deficits in the nation. The causes making the current account deficits are not always negative. These causes analyzed by Milesi-Feretti and Balanchard (2011) and proved as good and bad causes. According to the analyzes, these causes are summed up as follows: the misusing of the fiscal regulators is the first bad cause that leads to the current account deficit generation, that is reducing the national savings and the second is the failures of financial regulation that is increasing the level of credits. As said previously, some causes are analyzed as good causes, different from the bad ones. The main good cause impacting the current account deficit is the value in exporting process provisionally low, and then the excellent futures of economic prospects that lead to decrease the savings. The last third good cause of current account deficit is to increase the investments level by rising up the marginal product of capital.

It may be a serious problem for the economy. A serious and uninterrupted current account deficit usually may be a signal of unpleasant showing and the vulnerability of the economy. An uninterrupted current account deficit as well is the basic factors of the weakness of savings and investments, the structural economic problems such as a non-developed financial system and the absence of international competitiveness. In the other view, for years, it has been estimated that one of the best way to make right the current account deficit is to grant a depreciation of the real exchange rate, which would change the international trading decision by changing the concerned prices (Henry and Longmore, 2003: 3).

Moreover real exchange rate is the key and strategic macroeconomic fundamental that plays a key role in ensuring a country competitive in international trade. An increasing real exchange rate would increase export and reduce import. So the current account deficit will reduce. In this regard, exchange rate one of the key factor of the current account balance.

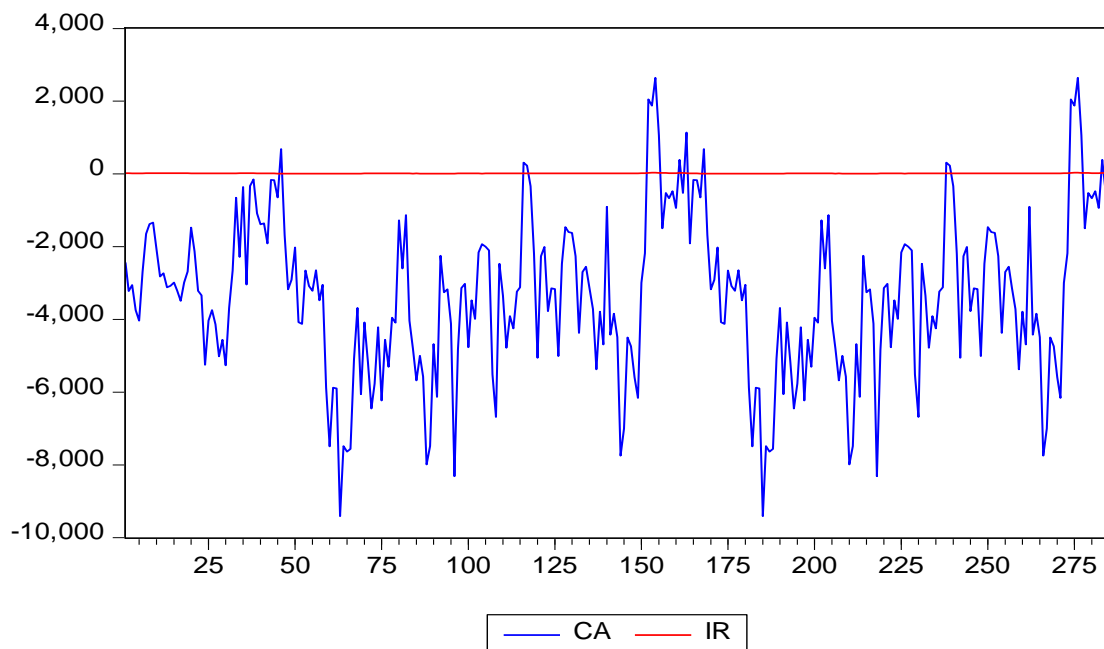
The fluctuations of the interest rates have great effects on the balance of payments via the real demand of money. Knowing that the raise of interest rate leads to raise the cost of having cash money, the demand of real cash money will decrease. This supports the acquisition of national and foreign securities just like national and foreign goods acquisition. Furthermore, the raise of interest rate supports also foreign capitals inflows. The impact of this progress will stand according to the share of an raise in imports and a reduction of exports resulting from the decrease of money demanded just like the evolution of an amount of foreign capital inflow in the country.

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The private sector businesses seem to resort to foreign currency and the short-term debt tools in Turkey. The balance sheet of nonnegotiable firms is affected negatively through the depreciations of the real exchange rate, while can potentially bring about the companies are more competitive and ponder over the capacity of firms to pay back their debts (Kesriyeli, Özmen and Yiğit 2005, 2).

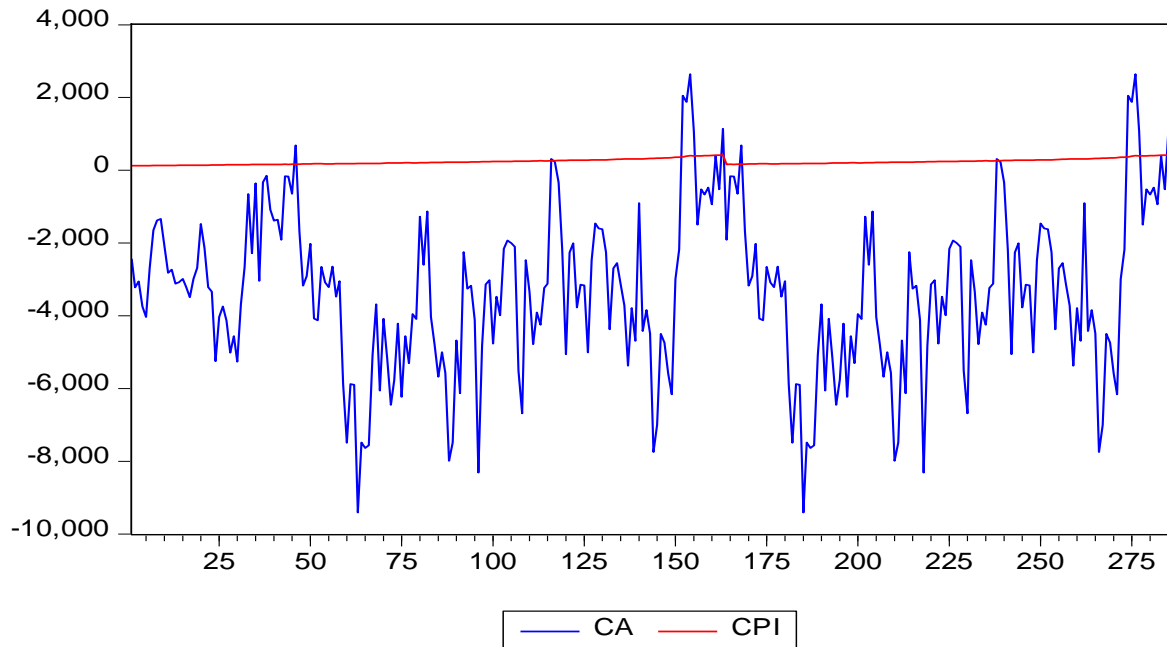
We aim to research the determinants of current account deficit with real exchange rate, consumer price index, and interest rate variables in Turkey;. In the following section, we write about different literatures according to current account. In the third section, methodology is explained. In the fourth section, empirical findings are interpreted and implications are made of empirical findings.

**Graph 1:** Indicator of Current Account Deficit And Interest Rate

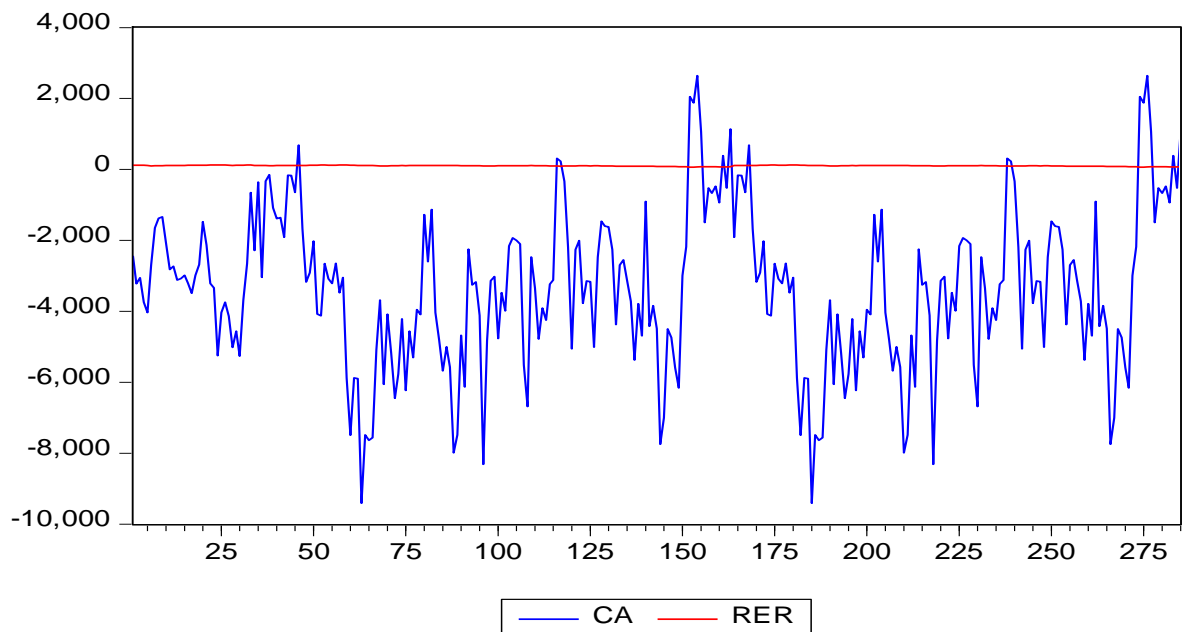




**Graph 2:** Indicator Of Current Account Deficit And Consumer Price Index



**Graph 3:** Indicator Of Current Account Deficit And Real Exchange Rate



## LITERATURE REVIEW

There are growing literatures reviews that focus on current account deficit, consumer index price, real exchange rate and interest rate. In those there are:

Lee and Chinn (2006), investigate the current account deficit and real exchange rate dynamic in G7 countries from 1979 to 2000 using the vector autoregression model (VAR). The analyses shows a

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stable shocks causes bigger long-run influences on the real exchange rate, while lesser influences on the current account.

Arghyrou and Chortareas (2008), made the study on the determinants of current account tuning and the effects real exchange rates on current account in Euro area from 1975-2005 by applying the via applying Johansen and Juselius co-integration and VAR estimation methodology. They found that real exchange rates can determine the current account in the EMU and there exist a Long run has a negative relation between RER and CA.

Chinn and Wei (2008), for over 170 countries, examines the dependence of the current account rate on the degree of exchange rate stability in the period 1971-2005 with VAR model. The analysis shows that there is a poor, solid or uniform relationship between real exchange rate and current account deficit.

Lebe, Kayhan, Adıgüzel Yigit (2009), empirically investigated the impact economic growth and exchange rate on current account deficit for Romania and Turkey (1997-2007). The results of the structural vector autoregressive analysis indicate that the most significant cause of current account is the change in economic growth.

Cheung, Chinn, and Fujii (2009) examined how trade flows take action to exchange rate and economic actions with data for the period 1980-2006 in China. The ordinary least square regression method and the Johansen cointegration model results suggest significant cointegration between the real exchange rate and the consumer price index.

Brissimis, Hondroyannis, Papazoglou, Tsaveas, and Vasardani (2010) investigate the basic financial, macroeconomic, and structural indicators that defined the current account progress in Greece between 1960 and 2007. For cointegration estimation, first autoregressive distributed model, then linear model is applied. They investigated that a strong equilibrium current account model may be established when the rate of private sector financing to GDP as a representative of financial liberalization is added in the model.

Yan (2011) empirically analyzes the effects of rate of openness to international trade, net foreign asset stock, real exchange rate, and relative income on the current account balance in emerging Asian economies in 1980-2009. The co-integrated VAR approach findings indicate that Asian economies behave heterogeneously in current account and there consists higher and significantly long-term relationship between net foreign assets starting stock, current account, trade openness, domestic relative income, and REER, for all exemplary economies.

Kesikoğlu et.al.(2013) Study about detecting the factors of current account deficit in 28 OECD countries using the panel data period of 1999-2009. The autoregression distributed lag is applied for this detection. According to achieved findings from panel VAR estimation, interest rate, budget deficit, and growth have a small and medium term effect on the current account deficit while exchange rate doesn't affect on it.

Özata (2014), researched the nexus between the current account deficit is high oil prices for Turkey during the 1998-2012 period. Structural vector auto-regression (SVR) model was applied in order to discover the impact of fuel imports of foreign policy on Turkey's current account deficit economic growth. Empirical analysis shows that there is a negative connection between current account deficit and real exchange rate in Turkey. The decrease in RER causes an increase in CA for Turkey.

Badejo and Oshota (2015) investigate the current account balance in West Africa States using the period 1980–2012 data. The Autoregressive distributed lag (ARDL) model findings indicate that in the long term, gross domestic products per capital, investment, M2 money supply and DER in pooled mean group model positively influence current account balance but the real effective exchange rate (REER) significantly and negatively affect the current account balance in the long term.

Karabulut and Şahbaz (2016), explore the effects of exchange rate on current account in fragile five countries. In this regard, the period for Brazil covers the period between 1991Q1 – 2016Q1, for Turkey 1987Q1 – 2016Q1, for India 2004Q1 – 2015Q2, for Indonesia 1990Q1 – 2015Q3 and for South Africa the time period covers 1980Q1 – 2016Q1. The effects of real exchange rate on current account deficit were analysed with SVAR and the result suggests, in the case of Brazil, Turkey and Indonesia, real exchange rate increase (depreciation in national currency) would reduce the current account deficit. There is no relation between real exchange rate and current account balance in India and South Africa.

Özdamar, (2016) examined the relationship between current account balance, gross domestic product the international terms of trade, real effective exchange rates, and domestic interest rates in Turkey for 1995:Q1-2015:Q3 period. According to the ARDL findings, increases in international terms of trade, foreign trade balance, and gross domestic product positively and significantly influences the current account balance for Turkey.

Çalışkan and Karimova (2017), investigate the current account deficit, and exchange rate balance sheet impacts in Turkey from 1998-2013. Using the panel regression, the empirical result shows the negative relationship between domestic currency and current account deficit (decrease of domestic currency causes the increase of CA).

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Bussiere, Karadimitropoulou, and Léon-Ledesma (2017) investigated the basic shocks that caused current account volatility for the G6 economies. According to the results of the structural vector auto regression analysis established for the period 1980-2015, it reveals that there is a significant connection between the current account and the real exchange rate.

Islatince, (2017) examines the nexus between current account deficit, economic growth, individual loans, and exchange rates in Turkey, during the period 2003:Q4 to 2016:Q4. The relationship is analyzed by using ARDL approach. The findings indicate that all variables used in the study have meaningful impact on economic growth in the short and the long-term. And also, the coefficient of dummy is found statistically significant and negative.

Eita, Manuel and Naimhwaka (2018) researched the influence of macroeconomic indicators on the current account balance for Namibia for the period 1990 – 2016. The ARDL model and Bound test results reveal that the increase in real GDP, capital flows, or per capita, causes a disruption in the current account. In addition, the raise in interest rate, population, and commodity prices bring about the account balance to progress.

Benli and Tonus (2019) researched the macroeconomic factors of current account deficit for Turkey for the 2006-2019 years with ARDL Model analysis. According to their findings, budget balance, exchange rate and interest rate significantly affects the current account deficit in the long term, only GDP and budget balance have a significant influence on current account deficit in the short term.

## **2. DATA, VARIABLES AND METHODOLOGY**

This study focuses on effects of consumer index prices, interest rest and the real exchange rate on the current account deficit of Turkey. In that, the data retrieved from Turkish Statistical institute using the World Development Indicators (WDI) of the World Bank monthly data spanning 2006:1-2019:7.

**Table 2. Data Explanations**

<b>Variables</b>	<b>Symbol</b>
Current account deficit	CA
Consumer index price	CPI
Interest rate	IR
Real exchange rate	RER

## **2.2 Cointegration- ARDL Bounds Tests**

Peseran et al. (2001) advanced the Auto Regressive Distributed Lag(ARDL) bounds testing and this method has some advantages compared to classical cointegration tests to reveal the long-term relationship between factors. According to the ARDL approach, the cointegration relationship of variables integrated with I (0), I (1) or a combination. For this reason, Augmented Dickey-Fuller (ADF), Phillips-Peron (PP), Kwiatkowski-Phillip-Schmidt-Shin (KPSS) and Ng-Peron (NP) methods generally use as way to discover the unit root position of variables. With the Unrestricted error correction model (UECM) originated from the ARDL boundary test, both short-run and long-run relationships between factors are revealed.

The ARDL model is presented as follows when evaluating the long-term relationship and the short-run parameter dynamics:

$$\Delta CA_t = \alpha_0 + \sum_{i=1}^m \alpha_{1i} \Delta CPI_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta IR_{t-i} + \sum_{i=0}^k \alpha_{3i} \Delta RER_{t-i} + \theta_1 CA_{t-1} + \theta_2 CPI_{t-1} + 3IR_{t-1} + \theta_4 RER_{t-1} + u_t \quad (1)$$

Information criteria such as appropriate lag choice about the AIC, HQ and SB are used in the time series analysis to be applied to analysis the long-term relationships between variables. The significance of the lagged values in the estimated model is examined with the F test. According to the following null hypothesis for the F test, it is confirmed that there is no long-term cointegration relationship between the factors.

$$H_0: \theta_1 = \theta_2 = \theta_3$$

$$H_1: \theta_1 \neq \theta_2 \neq \theta_3$$

The calculated F value according to the model is check againgst the lower and upper limits calculated by Peseran et.al (2001). If the F value is less than the table lower value, the H0 hypothesis stating that there is no cointegration cannot be rejected. If the F value is bigger than the upper limit, H0 is rejected and the long-term relationship between the factors in the model is considered. After the cointegration analysis, error correction model is established as shown in Equation 2. The error correction coefficient  $\psi$  in this model shows how soon shocks occurring in the short term will stabilize in the long run. This coefficient should be negative and statistically significant.

$$\Delta CA_t = \beta_0 + \sum_{i=1}^m \beta_{1i} \Delta CPI_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta IR_{t-i} + \sum_{i=0}^k \beta_{3i} \Delta RER_{t-i} + \psi ecm_{t-1} + v_i \quad (2)$$

### 2.3. Toda Yamamoto Causality Test

The causality tests are used as a statistical hypothesis test to decide whether a time series is the cause of the other variable and to use it as a reliable variable in explaining the other variable. The test for causality is such a technique, seeking the direction of causality between the used variables.

### 3. FINDINGS OF THE RESEARCH

The unit root test results for the variables used in the model are included in Table.3. According to the findings, it is seen that the CA variable is stationary in ADF, PP, KPSS and NG-Perron tests, while the other variables are I (I).

Table 3. Unit Root Test Results

VARIABLE	ADF	PP	KPSS	NG- Perron				DECISION
				$MZ_a$	$MZ_t$	MSB	MPT	
CA	-4.367(13) <sup>C**</sup> -3.454(1%) -2.872(5%)	-6.606(2) <sup>C**</sup> -3.453(1%) -2.871(5%)	0.085(12) <sup>C*</sup> 0.739(1%) 0.463(5%)	-362.056(13)** -13.800(1%) -8.100(5%)	-13.43(13)** -2.580(1%) -1.980(5%)	0.037(13)** 0.174(1%) 0.233(5%)	0.089(13)** 1.780(1%) 3.170(5%)	I(0)
CPI			0.167(14)* 0.216(1%) 0.146(5%)					I(1)
$\Delta$ CPI	-16.741(0) <sup>C**</sup> -3.453(1%) -2.871(5%)	-16.741(3) <sup>C**</sup> -3.453(1%) -2.871(5%)		-141.499(0)** -13.800(1%) -8.100(5%)	-8.409(0)** -2.580(1%) -1.980(5%)	0.059(0)** 0.174(1%) 0.233(5%)	0.175(0)** 1.780(1%) 3.170(5%)	
IR	-3.464(1)** -3.453(1%) -2.871(5%)		0.157(13) <sup>C*</sup> 0.739(1%) 0.463(5%)	-15.859(1)** -13.800(1%) -8.100(5%)	-2.786(1)** -2.580(1%) -1.980(5%)	0.175(1)** 0.174(1%) 0.233(5%)	1.659(1)** 1.780(1%) 3.170(5%)	I(0)
$\Delta$ IR		-9.692(25)** -3.453(1%) -2.871(5%)						
RER			0.710(14)* 0.739(1%) 0.463(5%)	-19.855(1)** -23.800(1%) -17.300(5%)	-3.118(1)** -3.420(1%) -2.910(5%)	0.157(1)** 0.143(1%) 0.168(5%)	4.7910(1)** 4.030(1%) 5.480(5%)	I(0)
$\Delta$ RER	-13.600(0)** -3.453(1%) -2.871(5%)	-13.29(17)** -3.453(1%) -2.871(5%)						

Notes: The lag lengths reached with the Schwarz Criterion in the ADF test are indicated in parentheses. Bartlett Kernell estimation method has been used in PP, KPSS and NG-Perron analyzes. The bandwidth is Newey-West. a: there is no

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constant or trend. b: there are constant and trend. c: there is only constant term. \*, \*\*, \*\*\*; 1%, 5% and 10% present the statistical significance level.

### 3.2 Bound Testing For Cointegration

The optimum lag selection criteria findings for the model are represented in Table.4 for AIC, SIC and X2 Breusch-Godfrey. Accordingly, we decide that the optimum lag length is 3.

**Table 4 : Optimum Lag Selection Criteria**

M	AIC	SIC	X <sup>2</sup> BREUSCH-GODFREY
1	17.4450	17.5996	4.806 (0.48)
2	17.451	17.658*	3.473 (0.482)
3*	17.4366	17.6956	8.701 (0.06)
4	17.4548	17.7664	4.17 (0.382)
5	17.4501	17.8146	12.42 (0.014)
6	17.4492	17.8667	3.810 (0.432)
7	17.4722	17.9432	13.78 (0.003)
8	17.4869	18.011	15.23 (0.004)
9	17.4776	18.056	40.29 (0.000)
10	17.421	18.054	41.61 (0.000)
11	17.335	18.023	70.41 (0.000)
12	17.219	17.962	51.50 (0.00)

**Notes:** X<sup>2</sup> Breusch- Godfrey applied for examining the autocorrelation tests. Probability values are given in parentheses. The selected lag length is indicated by \*.

Since F test results in Table.5 is above the critical values, we can assume that there is a long-term cointegration relationship between the variables at the 1% significance level.

**Table 5: Bound Test Result**

k	F-statistic	Criteria Value	
3	7.1966*	1% level	
		<b>Lower Bound</b>	<b>Upper Bound</b>
		4.29	5.61

**Notes:** The number of independent variables is expressed as k. Peseran et.al (2001;300)'s critical values are used.

In the next step of empirical analysis, ARDL model was established and long and short term relationships between the considered variables were investigated. In this method, the dependent variable are explained by the lagged values of the variables.

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**Table 6: The Long Run Coefficients from ARDL (2,4,4,4) Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI	-9.339217	11.36860	-0.821492	0.4121
IR	311.5520	86.86114	3.586783	0.0004
RER	-48.54840	71.83609	-0.675822	0.4997
EC = CA - (-9.3392*CPI + 311.5520*IR -48.5484*RER )				

The Long Run Coefficients from Auto Regressive Distributed Lag (2,4,4,4) Model, as it's shown in the Table 6, has at least one variable (IR) which is significant at 1 percent criteria. Nevertheless, the long run analysis supports the cointegration between the variables. The interest rate (IR) which is significant and positive affect on the current account deficit.

**Table 7 : Result from ARDL(2, 4, 4, 4) Error Correction Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-237.2810	95.34304	-2.488708	0.0134
D(CA(-1))	-0.155993	0.059965	-2.601406	0.0098
D(CPI)	-5.546577	7.654410	-0.724625	0.4693
D(CPI(-1))	-18.47369	8.322642	-2.219691	0.0273
D(CPI(-2))	-19.86169	8.616397	-2.305104	0.0219
D(CPI(-3))	19.41044	8.212789	2.363440	0.0188
D(IR)	88.68103	95.88909	0.924829	0.3559
D(IR(-1))	120.2535	109.7408	1.095796	0.2742
D(IR(-2))	214.8017	109.0318	1.970084	0.0499
D(IR(-3))	-222.9772	92.68775	-2.405681	0.0168
D(RER)	-52.67684	32.61691	-1.615016	0.1075
D(RER(-1))	1.813575	35.23011	0.051478	0.9590
D(RER(-2))	-47.47091	35.81354	-1.325502	0.1862
D(RER(-3))	93.75952	34.59477	2.710222	0.0072
CointEq(-1)*	-0.321706	0.051138	-6.290985	0.0000



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The Error Correction Model offers the opportunity to reveal the short-term relationships between the variables analyzed in the ARDL Model. In the model, first the first difference of the dependent variable is estimated by using the lagged values of all other variables. In addition, a period-lagged error term obtained from the ARDL model should be used. The Error Correction Term Coefficient (ECT) must be negative and statistically significant. In this case, it proves that there is a cointegration relationship between variables. The error correction term coefficient shows how much time is needed for the improvement in the relationship between variables in the long run due to shocks that may occur.

Table.7 shows the short-term effects of explanatory variables on the current account deficit in the error correction model in ARDL (2,4,4,4) model. The results obtained show that The Error Correction term is negative and statistically significant. The estimated coefficient established that there is a cointegration relationship between variables and 32% of the shocks will disappear in the long term.

### 3.3 Toda Yamamoto Causality Test

**Table 8:Toda Optimum Lag Selection Model**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3520.270	NA	4.65e+14	47.96286	48.06457	48.00419
1	-2654.096	1661.641	4.98e+09	36.51831	37.12860*	36.76627
2	-2594.399	110.4590	3.11e+09	36.04624	37.16511	36.50085
3	-2548.307	82.14983	2.34e+09	35.75928	37.38673	36.42053*
4	-2513.942	58.91229	2.07e+09	35.63186	37.76788	36.49975
5	-2489.965	39.47252	2.12e+09	35.64578	38.29038	36.72031
6	-2463.942	41.06917	2.12e+09	35.63187	38.78505	36.91304
7	-2449.827	21.31708	2.50e+09	35.77996	39.44171	37.26777
8	-2415.835	49.02222	2.27e+09	35.65762	39.82795	37.35207
9	-2392.379	32.23243	2.40e+09	35.67862	40.35753	37.57972
10	-2356.608	46.72148	2.16e+09	35.53208	40.71956	37.63981
11	-2330.507	32.31489	2.24e+09	35.51711	41.21317	37.83148
12	-2262.999	78.98946*	1.34e+09*	34.93876	41.14340	37.45977
13	-2235.517	30.28600	1.40e+09	34.90499*	41.61821	37.63265

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**Table 9: Result from Toda Yamamoto Causality Test**

Variables	CA	CPI	IND	IR	RER
CA		10.89*	1.76	8.27*	0.71
CPI	0.04		0.44	8.10*	6.58*
IND	0.45	1.08		0.00	2.61
IR	6.38*	0.01	0.41		16.65*
RER	1.40	3.07	0.99	1.22	

*Notes:* \* indicates the causality from one variable to another one.

The results from Toda Yamamoto causality test prove that there is causality between certain the factors. According to the causality tests findings obtained; while there is bidirectional causality between the current account deficit and the interest rate, it is revealed that there is causality from the consumer price index to the interest rate. In addition, it is estimated that there is causality from the consumer price index to the real exchange rate, as well as a one-way causality from the interest rate to the real exchange rate.

#### 4. CONCLUSION

In recent years, Turkey's economy has reached such dimensions that concern occurs the increase in the deficit in current account is unavoidable. Since the deficit in current account causes significant reflections on many different macroeconomic variables, strong measures should be implemented. Theoretically, the reasons for the current account deficit are explained with different reasons. However, it is important to reveal the relationship between the current account deficit and macroeconomic indicators using empirical analysis.

In this study, the macroeconomic cause of the current account deficit in Turkey's economy has aimed to find out. For this reason, monthly data covered for the period 2006:1-2019:7 were used in the study. In the study, consumer price index, real exchange rate and interest rate variables have been chosen as the explanatory variables of the current account deficit. The current account deficit has tried to put forward arguments using macroeconomic grounds in Turkey. The hypothesis test were investigated by using the unit root analysis, Bound test and Error Correction Model that explains the relationship between variables.

It has been confirmed by empirical findings that there is cointegration in both short and long term among the variables discussed in the analysis. The error correction model obtained from ARDL (2,4,4,4) model provides information about the short run effects of variables on current account deficit. The Error Correction Term Coefficient (ECT) must be negative and statistically significant. In this

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case, it proves that there is a cointegration relationship between variables. The error correction term coefficient shows how much time is needed for the improvement in the relationship between variables in the long run due to shocks that may occur. The results from bound tests show that there exists a strong cointegration at 1 percent level between the given variables which means that the different independent variables like interest rate, consumer price index and the exchange rate may have an effect on the current account deficit. Through the autoregression distributed model, it's shown that the interest rate is significant and has a positive impact on the current account deficit in the long term.

Toda and Yamamoto causality test give some evidence that while there is bidirectional causality between the current account deficit and the interest rate, it is revealed that there is causality from the consumer price index to the interest rate. In addition, it is estimated that there is causality from the consumer price index to the real exchange rate, as well as a one-way causality from the interest rate to the real exchange rate. Hence, the findings of this research suggest that interest rate can be a useful instrument to discover a solution for current account deficit for policymakers in Turkey.

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**GLOBAL MACROECONOMIC UPDATES AND FUTURE PROJECTIONS ON GHANA  
ECONOMY**

**Seeba SALIFU <sup>(1)</sup>, Ufuk BİNGÖL <sup>(2)</sup>**

<sup>1</sup> M.Sc. Student, Bandırma Onyedi Eylül University, Institute of Social Sciences, Department of Economy, Bandırma, Balıkesir, Turkey. seebasalifu@deu.edu.tr, 0000-0003-2928-0061

<sup>2</sup> Asst. Prof., Bandırma Onyedi Eylül University, Institute of Social Sciences, Department of Economy, Bandırma, Balıkesir, Turkey. ubingol@bandirma.edu.tr, 0000-0003-1834-842X

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**ABSTRACT**

*The aim of this study is to identify how Ghana is maintaining macroeconomic issues. Starting with 2000's The Ghanaian economy has taken serious steps in terms of growth, international integration and globalization in recent years, still, various difficulties bother development, distribution and reallocation of income and sustainability. More than 60 years of declaring independence, the requirement for a conventional scholastic exploration for drawing in minds on the past, present and future condition of the economy has been hiding out of sight. As the maiden issue, this study seeks to retrace developments in the economy a few steps back to bring readers up to date on the current state of research. This study is consequently not a thorough treatment of the point, and it does not cover all the elusive subtleties of the Ghanaian economy. Instead, the challenge is to show how risky factors and globalization efforts affect Ghana Economy. As a descriptive method, this study offers some perspectives on the literature for readers of the journal, investors, managers of the economy, regulators and academics while also providing a road map for future research endeavours.*

**Keywords:** *Ghana, GDP. Economy, Globalization Impact, Changes.*

**JEL Codes:** M12, M14, M19

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***& EXTENDED WITH SOCIAL SCIENCES***  
***August 21-22, 2020 / Izmir – TURKEY***

## **1. INTRODUCTION**

After picking up its independency in 1957, Ghana has attracted a sinusoidal wave in terms of financial and social development. After progress to popularity based politics and unregulated economic system after the 1980s, Ghana places in a method of balanced out structure because of auxiliary execution (Geiger et al., 2019). This procedure means to present a late 2010's macroeconomic updates by examining the current economy and money information from Ghana authorities. Ghana sits on the Atlantic Sea and fringes Togo, Cote d'Ivoire, and Burkina Faso. Ghana has a populace of about 30.1 million (GES, 2019). In the previous twenty years, it has taken significant steps toward majority rule government under a multi-party framework, with its autonomous legal executive winning public trust. Ghana is in the best three nations in African nations which has an excellent level for the right to speak freely of discourse and press opportunity, with fantastic transmission media, and network being the medium with the best reach (IMF, 2020). Factors such as these furnish Ghana with substantial social capital. Nevertheless, especially with the help of liberalization strategy, Ghana has achieved positive developments in many sectors (Huq & Tribe, 2018). Ghana's economy kept on growing in 2019 as the predefined quarter Gross Domestic Product (GDP) development was assessed at 6.7%, contrasted and 5.4% in a similar time of a year ago. Non-oil development was likewise stable at 6.0%. The generally high quarterly development was carried out by a sharp regeneration in the services sector mostly with the help growing foreign direct investment (FDI) which developed by 7.2% contrasted and 1.2% in 2018.

Ghana's economy developed by 10.1 % in 2020, with low double-digit inflation; and stable financial balance. Growth is required to ease back to 2.5 % in 2020 because of the Coronavirus pandemic. The medium-term viewpoint is better, notwithstanding extra support related decreases in oil creation. Harmful risks identify with unexpected and genuine liabilities in the finance and energy sectors; and spending pressures in the approach to the 2020 election. Stagnant poverty reduction and persistent regional disparities will remain an issue to solve. This proceeding consists of 4 sections. After the introduction, section 2 shows the recent updates and comparison on Ghana economy with related countries and regions. Section 3 presents fiscal and financial issues under six parameters. Sections 4 implicates macroeconomic performance goals for Ghana economy shortly and proceeding ends by briefly conclusion and evaluation of current issues in Ghana economy.

## **2. GHANA ECONOMY FROM THE GLOBALIZATION AND INTEGRATION PERSPECTIVE**

### **2.1. Recent Updates**

Real GDP eased back from 6.1 % in 2019 to 4.9 % in 2020. This decline mirrored the drowsy development in the second from last quarter as 2020, with an essential decline in the industry because of lower mining and quarrying yield. The uptick in agriculture, because of the ideal climate and higher ranch entryway costs for cocoa, could not balance the decline in different sectors. The growth between January and September 2020 was 4.8 %, contrasted with 6.1 % in 2019 (GSS, 2020).

Ghana's inflation stayed under 10% in 2019. A ban on national bank financing of the monetary shortfall, and lower non-food costs, assisted with holding inflation in line at 7.9 % at end December 2019. Lower inflation permitted the national bank to slice its policy rate to 16 %. Commercial bank lending rates, while declining, stayed at a high 23.6 % in 2019 (World Bank, 2019). The enormous spreads propose progressing shortcomings in the financial framework.

Financial developments have started paying off, as indicators improved. The development of credit to the private sector arrived at 18.3 % in December 2019, up from 10.6 % in December 2018. Resource quality likewise improved fundamentally, and the Non-Performing Loans (NPL) ratios declined to 13.9 % in December 2019 from 18.2 % in December 2018, driven by expanded credit recuperations and benefits.

The fiscal deficit was 4.7 % of GDP in 2019, while the general financial deficiency, including finance and energy sector costs, arrived at 7 % of GDP, a similar level as in 2018. All incomes at 14.8 % of GDP were 0.3 % of GDP higher in 2019 than in 2018. The pledge to close the financing gap for the Energy Sector Recovery Program (ESRP), which started in May 2019, included an expected 1 % of GDP to the official budget. The financial sector tidies up, which advanced into 2019 with a more extensive order to determine indebted banks and change Exceptional Store taking Establishments, brought about an extra expense of 1.3 % of GDP to the budget; the overall fiscal deficit arrived at 7 % of GDP in 2019, same as 2018.

The current account deficit increased at 3.4 % of GDP in 2020, 0.3 points more than in 2019. Improved export income for gold and oil brought about an exchange surplus comparable to 3.8 % of GDP, up from 2.8 % in 2019. The current account deficiency was financed by both higher FDI and improved portfolio inflows, which were sufficiently huge to make up for outflows on the financial account identified with Government amortization and "other" private net outflows (World Bank, 2019). Net reserves as international remained at US\$3.9 billion (1.9 long stretches of import spread)



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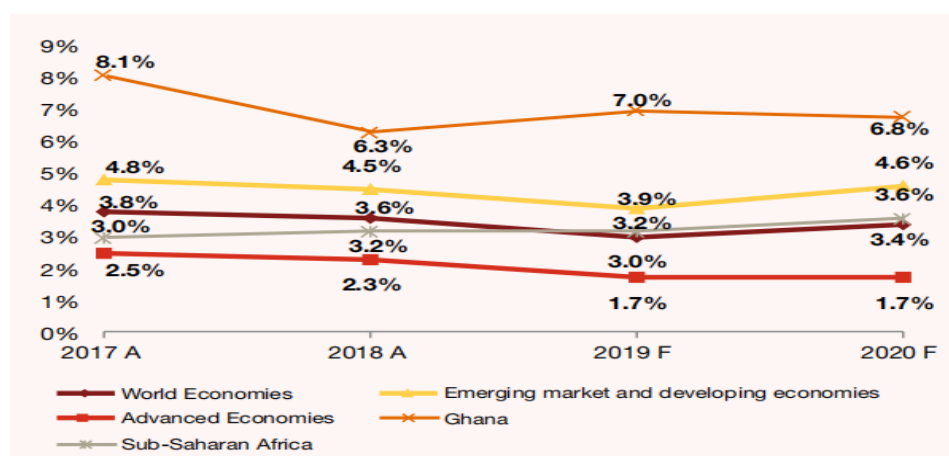
toward the end-2019, while gross reserves added up to US\$ 5.1 billion (2.4 long periods of import spread). Stores have improved further with the US\$3 billion Eurobond gave in February 2020.

The Ghanaian Cedi devalued by 16.6 % in 2019 as the BoG stopped its market intervention to end the exhaustion of international reserve. The devaluation way was turned around at first in mid-2020 with a valuation for 5.3 % against the USD by February 2020, helped by the fruitful Eurobond situation; as the Coronavirus emergency heightened in the second quarter of 2020, deterioration set in again and invalidated all underlying increases in 2020.

## 2.2. Globalized Correlation on Ghana's Economy

The Ghanaian economy has since 2017 globalized in terms of economy and this is relied upon to proceed in 2019 with a temporary growth rate of 6.98% from 6.26% in 2018. The World Economic Outlook (WEO) shows that worldwide growth rates stay debilitated at 3.0% in 2019, after declining pointedly in the last 75% of 2018 (IMF, 2019). This rate is the least on record since 2008–09 and is lower than the 3.60% rate recorded in 2018. Growth rates in developed economies is extended to back off to 1.70% in 2019 and 2020, contrasted with 2.50% and 2.30% recorded in 2017 and 2018, separately (IMF, 2020). This low growth is a result of rising trade barriers; raised uncertainty for trades and international affairs; some components are causing macroeconomic strain in a few emerging market economies; and structural issues; low productivity development and demographics like ageing in developed countries (PWC, 2019).

**Figure 1 Worldwide GDP Development and Ghana (2017-2020)**



**Source:** World Financial Viewpoint October 2019 and 2020 Spending Articulation (IMF, 2020)

The Ghanaian economy keeps on performing in a way that is better than the worldwide economy, and this is extended to proceed in the medium term. Although aspiring, the expected growth rate of 6.79% for 2020, is relied upon to be driven chiefly by the non-oil sectors. The economy is

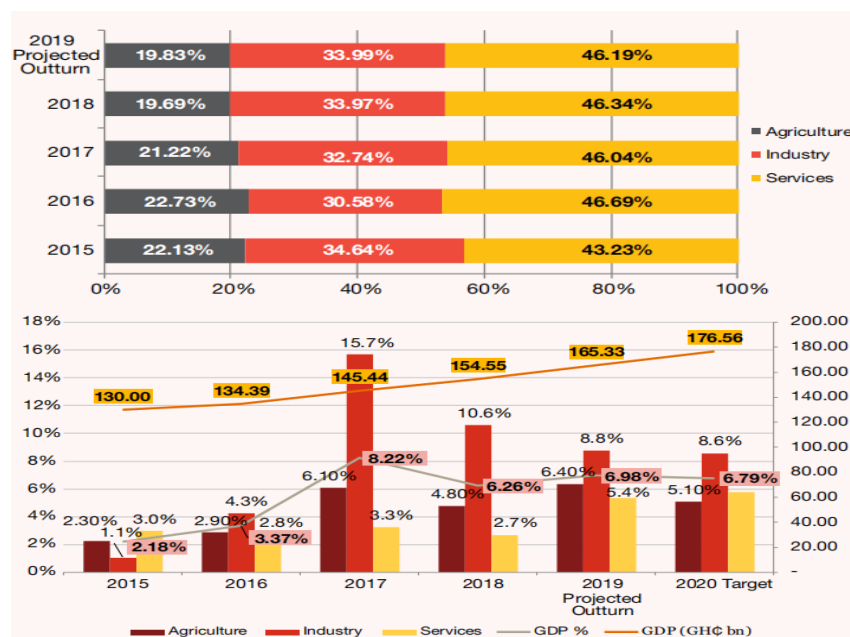
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likewise expected to profit by the African Continental Free Trade Agreement (AfCFTA) and FDI which are relied upon to twofold throughout the following ten years.

### 2.3. Sectoral Analysis of Ghana's Economy

The structure of the economy remains generally unaltered as the services sector keeps on contributing to growth. Agriculture was the biggest sector of the Ghanaian economy till the services sector surpassed it at the end of the 1980s. Then, in the 2010s, it moved to the third position changing with the industry sector, and the decline of the relative share of agriculture in GDP has continued. However, in terms of employment, even as recently as 2010, agriculture is still maintaining its secondary position, employing 42 % of the total labour force which is slightly lower than that of the services sector Figure 2 below shows the sectoral distribution to GDP from 2015 to 2019.

**Figure 2 Sectoral Structure of the Economy**



**Source:** MOF Ghana (2020) Budget Statement

The Agriculture sector is predicted to develop by 6.40% before the end of 2019, missing the mark regarding the focused on the growth of 7.30%. Development in the sector has been extended to back off to 5.10% in 2020 from the 7.30% focused in 2019.

The development in the services sector is assessed at 5.40% by the end of 2019, which is fundamentally lower than the objective of 7.30%. The lower-than-planned development was generally determined by terrible showing of the Instruction and Budgetary and Protection sub-sectors in 2019. Development in the Services sector has been extended to back off to 5.10% in 2020 from the 7.30% focused in 2019.

Development in the industry eased back down in 2019 and is required to additional stoppage possibly in 2020. In 2019, the industry sector was assessed to develop to 8.80% against the focused on the growth of 9.70% driven predominantly by the mining sub-sectors. Development in the oil sector is predicted to deteriorate as no new oil creation is relied upon to begin in 2020. Generally, development in the industry sector is extended to back off to 8.60% in 2020.

#### **2.4. Labor Markets, Poverty and Income Distribution on Ghana's Economy**

Ghana is still one of the best-educated countries in sub-Saharan Africa. Currently, educational expenditure in the total expenditure of Ghana is between 18 % and % 21 by years, and allocation from GDP to Education is % 6-7 approximately. (MOF, 2020). This educational commitment of Ghana is reflected not only enhancing school enrollment but also getting the results in the quality of the indigenous labor force. x. But according to Geiger et al. (2019) the fact that labor freed up in the agriculture sector instead of higher productivity sectors on a large scale. Continued growth in the 2000's has provided business services, and communication have also grown, but these sectors could not include labor on a large scale; mostly due to their skill requirements. However, as low-productivity sectors, wholesale and retail trade sectors has the most prominent absorption on employment. Indeed, the last two decades have seen stabilized economic growth despite considerable issues in macroeconomic perspective and a growing dependence on aid and other foreign inflows. On the other hand, promoting sustainable economic development based on economic growth through sectoral developments is essential. So there is still left to scrutinize to increasing employment capacity through sectoral development and incentives.

Reducing poverty decrease has eased back since 2012, and the occurrence of extreme poverty expanded to 13.36 % in 2019 – up from 12.1 % in 2012 (utilizing the worldwide poverty line of \$1.9 every day-PPP). The general increment in poverty at the public level is driven by rising poverty in the least fortunate, dominantly rural areas with low access to basic needs such as electricity, cleaning instruments, market. Even in rich regions of Ghana has encountered poverty to deal with some reduction policies. So it may be acceptable that Ghana is still facing local and regional inequalities.

### **3. FISCAL AND FINANCIAL UPDATES ON GHANA'S ECONOMY**

#### **3.1. Brief History and Evolution of the Financial Sector**

The financial framework in Ghana is very much organized in the offer to address the economic issues, particularly at the local and regional levels because of the misfortunes the economy endured locally during the 1980s (Huq and Tribe, 2018). Ghana government in 1989 has been issued a reform

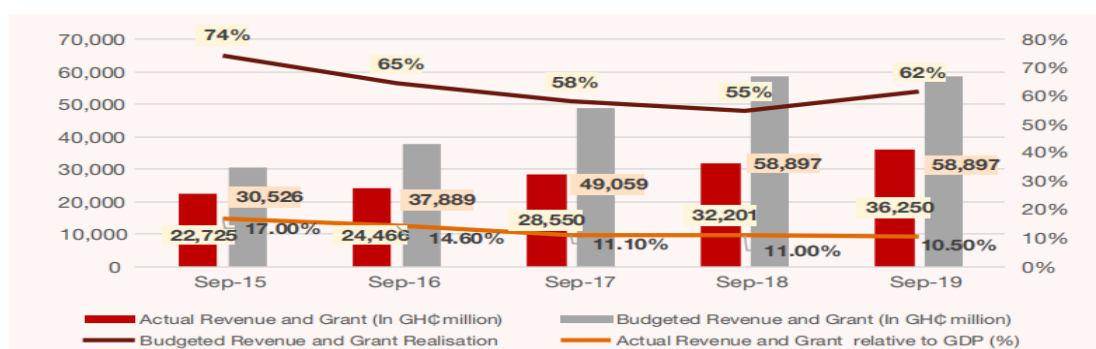
movement in the banking sector. In the 1990s, the financial framework (Particularly Banking Sector) was redesigned, it incorporates the national (Bank of Ghana), three substantial commercial banks (Ghana Business Bank, Barclay's Bank of Ghana, Standard Sanctioned Bank of Ghana), and seven other banks.

Although banks in Ghana offer probably the most effective rates in West Africa, they additionally appreciated expanded business in the mid-1990s due to high deposit rates. As the central bank, The Bank of Ghana brought increased rediscount rates up driving currency market and business bank financing costs considerably certain. As deceleration of inflation throughout the year, the rediscount rates were brought in stages down to 20 %, cutting lending rates down as needs are.

### 3.2. Fiscal Development

Total revenue and grants for January to December 2020 expected up to GH¢67,071 million and this was approximately 16.9 % of GDP contrasted with a reconsidered focus of around GH¢53,666 million (13.9 % of GDP) over a similar period (MOF, 2020). The setback in income effort was connected to the general under presentation of non-oil tax especially, the negative effect of lower import volumes on import tax and tolls, VAT, Customs, social security and health coverages and GETFund demands (PWC, 2019). This was additionally aggravated by the high induction of brought products into the zero-evaluated or potentially charge excluded import sections just as the lower tariff groups.

**Figure 3 Revenues and Grants for 2015-2019**



**Source:** MOF Ghana (2020) Budget Statement

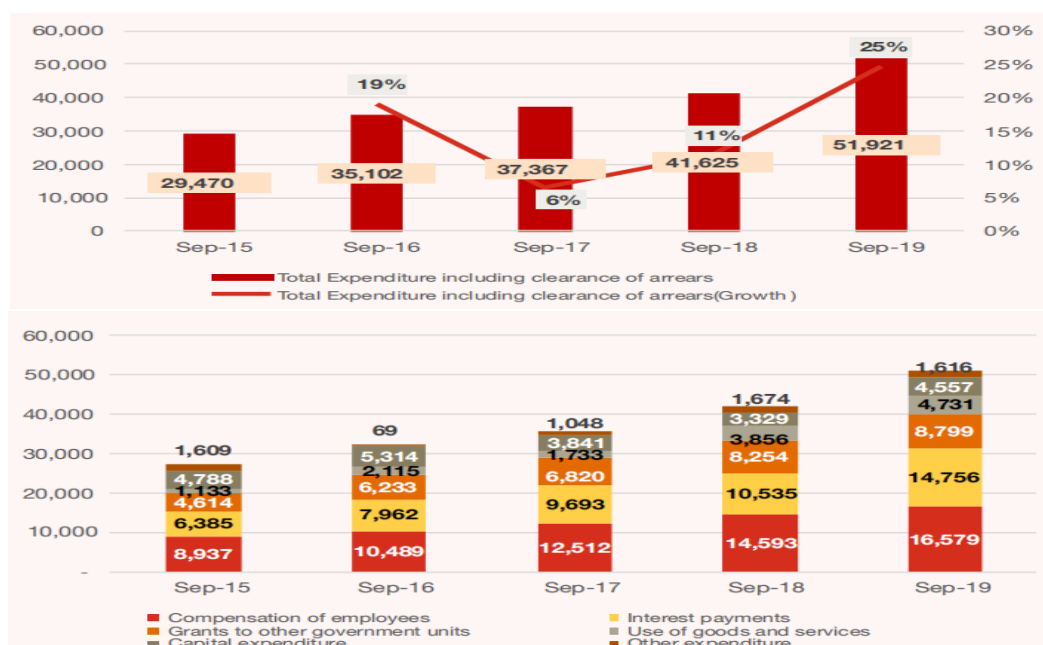
Issues in professional and comprehensive tax management in Ghana stay a key test for expanding Ghana's non-oil taxing revenues. In 2019s, Ghana recorded a tax to-GDP proportion of 12.90%, which is underneath the normal of 18-20% of its center pay nation peers and is as of now focusing on a 20% expense to-GDP proportion (through revolutionary strategy and institutional changes). It has gotten basic for government to heighten its push to digitize (through ID and effective

tax collection frameworks) tax income assortment and put in measures to broaden the country's tax net. This has become considerably more basic thinking about the expected loss of income from the government's drive to decrease imports and the decrease of import obligations.

### 3.3. Expenditure Performance

Absolute use including clearance of back payments added up to GH¢51,921 million (15.10% of GDP) which was 7.50% underneath focus for the period (Target: GH¢56,126 million, 16.20% of GDP). 56.10% of the yearly modified back payments of approximately GH¢ 1.000 million was cleared at the end of 2019 (MOF, 2020).

**Figure 4 Expenditures 2015-2019**



**Source:** MOF Ghana (2020) Budget Statement

Given the rigidities in government uses, particularly as employee's compensation, interest payments and other transfers take approx. 80% of all expenditure, along these lines restricting any optional costs, the proposed increment in capital use and Free Senior High School Policy (SHS) strategy is probably going to apply more tension on the Administration handbag. This reemphasizes the requirement for the government to be somewhat more forceful with improving its revenue collection and proficiency endeavours.

### 3.4. Deficits and Public Debt

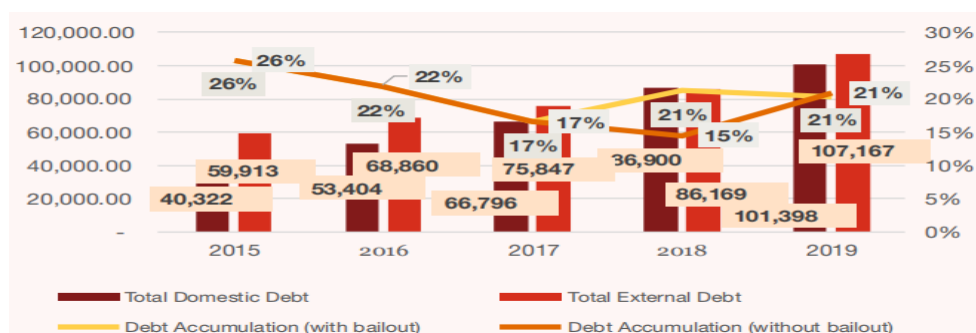
The fiscal balance on cache premise brought about a deficiency of GH¢15,672 million (comparable to 4.50% of GDP) against the modified spending plan of GH¢14,163 million (4.10% of

GDP) as at Sept 2019. The higher than modified financing was essential because of the front stacking of financing necessities to meet Government consumptions and other debt commitments.

Even though the administration has figured out how to remain inside the legal spending shortage limit needed, there remain troubles in preparation of tax revenue. Government's powerlessness to build tax system may drive it to slice use to remain inside the deficiency edge. Expenditure cuts may thus hinder financial development. The government should keep on utilizing strategy activities to drive a more productive and comprehensive assessment framework to help improve revenue collection to build the fiscal space for reasonable spending.

The public debt including the finance sector bailout costs toward the finish of September 2019 was GH¢208,565.18 million (60.55 % of GDP) involving external debt of GH¢107,166.78 million and Domestic debt of GH¢101,398.40 million (Figure 5)(PWC, 2019).

**Figure 5 Public Debt and Debt Accumulation Patterns (2015-2019)**



**Source:** MOF Ghana (2020) Budget Statement

The buyback of bits of the GoG 2022 and GoG 2023 Eurobond, and the debt the board tasks in the domestic market, have decreased rollover hazard related to these borrowings. In any case, the effect of foreign direct exchange capital outflows because of interest payments stays a significant test, especially as far as its effect on the economic stabilization of the Ghana Cedi.

### 3.5. Inflation and Interest Rates

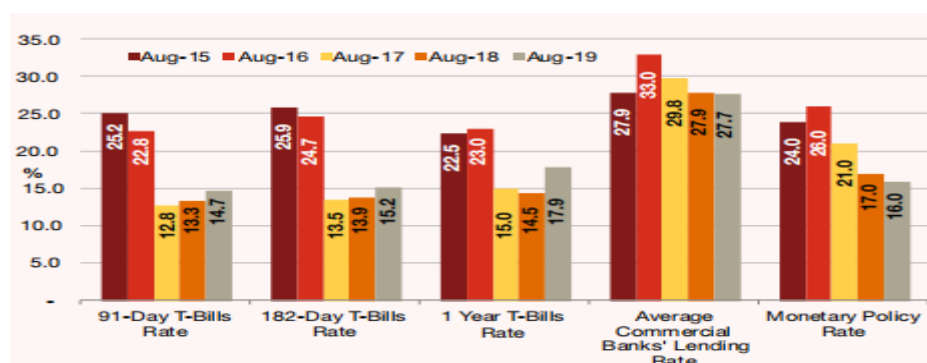
Inflation declined from 9.80% in September 2018 to 7.60% as at September 2019 (as Consumer Price Index (CPI)) and took a descending pattern from January 2019 where it remained at 10.80%. Government has extended inflation to 8% by 2020, which is inside the medium-term band of  $8 \pm 2\%$ . However, as current inflation rates are 10.6 % due to pandemic effect.

Even though the decrease in inflation in 2019 has been driven chiefly by non-food inflation and robust financial policies, decreasing sharply from 9.40% in July 2019 to 7.80% in August 2019 was incompletely affected by the rebasing of the inflation rate in August 2019. But as Covid19 pandemic

emerged in 2020 inflation rates with CPI started to increased again (Bank of Ghana, 2020) The rebasing prompted a critical increment in the number of things in the inflation basket while the purposes of information assortment likewise expanded.

The monetary policy rate decreased from 16% in August 2019 to 14,2 % in August 2020. The minor decreasing was because of a decrease in feature inflation expectation during the period combined with current situation. Regular business lending rates anyway diminished from 27.85% in August 2018 to 27.66% in August 2019, mirroring a minor reaction to the decrease in the financial approach rate from 17.0% to 16.0% over a similar period. As appeared in the outline beneath, the short-dated Depository charges rates have all moved upwards from August 2018 to August 2019.

**Figure 6 Lending costs Patterns (%) 2015-2019**



**Source:** MOF Ghana (2020) Budget Statement

The upward pattern found in T-charges rates to a great extent mirrors the impact of expanded homegrown obtaining by GoG. Great public sector credit extended by 33.39% from GH¢4,482 million in September 2018 to GH¢5,979 million in September 2019 (PWC, 2019). We consider the hole between the strategy rate and the normal banks' loaning rate to be too high [ $27.66\% - 16.00\% = 11.66\%$ ] as the overall general guideline all around the world, is for this differential not to surpass 5% (MOF, 2020). The high differential between the arrangement rate and the normal lending rate means that fundamental shortcomings that should be tended to if massive development in private area credit is to be accomplished.

#### **4. MACROECONOMIC PERSPECTIVES AND PROJECTIONS**

Ghana government plans to accomplish development in genuine GDP from an extended out turn of 6.98% for 2019 to a normal of 5.70% over the medium term (2020 to 2023). Inflation is additionally set to decrease from 7.60% as at September 2019 to an objective band of  $8 \pm 2\%$  over the medium term, while generally monetary deficiency is relied upon to stay inside the 5% limit forced by the Financial Obligation Act for years to come.



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**Figure 7 Sectoral Structure of the Economy**

Description	2019 Targeted**	2019 Projected Outturn	2020 Target	2020-2023 Target
Growth in Real GDP (incl.oil)	7.1%	7.0%	6.8%	5.7%
Growth in Real GDP (non-oil)	6.0%	5.9%	6.7%	5.9%
End of Period Inflation (%)	8.0%	8.7%*	8.0%	8±2%
Overall Fiscal Budget Deficit (% of GDP)	4.5%**	4.7%	4.7%	Not more than 5%
Gross International Reserves	Not less than 3.5 months of import cover	Not less than 3.5 months of import cover	Not less than 3.5 months of import cover	Not less than 3.5 months of import cover

**Source:** KPMG, 2020 Mid-Year review report

Government's moderate macroeconomic standpoint for short to medium-term uncovers its interests concerning the commitment of oil to genuine GDP development. The controlled standpoint for 2020 may likewise mirror the withdrawal in business and venture activities for the most part connected with political decision years.

The government should forcefully execute its domestic income preparation plan to guarantee that it can keep up use levels without breaking the 5% financial budget deficiency limits. A vital segment of the mobilization of revenue is the government's digitization plan pointed toward extending the tax net. In such manner, it is expected information picking on planned citizens to strengthen in 2020.

Growth is predicted at 2.5 % in 2020 because of the Coronavirus emergency, which set off an outside interest stun and a terms-of-exchange stun through a decrease Ghana's exchange, venture, and the travel industry challenges. Quickly falling domestic financial movement as an outcome of social isolation and distance measurements will add to the effect as the pandemic spreads locally. Over the medium-term, non-oil actions will keep on supporting by an immense growth by improved agriculture and agribusiness and a bounce back in the post-evolution in the finance sector. However, growth is relied upon to stay stifled even after the Coronavirus emergency, as oil creation eases back further because of support and lower oil costs.

Inflation is required to stay in single digits in 2020 and over the medium term. Ghana's present record deficiency is required to augment to 4.3 % of GDP in 2020 because of the Coronavirus and



lower costs; however, restricted to 4.1 % by 2022. The trade surplus will be counterbalanced by higher net outflows on the services and income accounts.

The general financial deficiency is relied upon to increment to 9 % of GDP (contrasted with the pre-Coronavirus emergency projection of 6.4 % of GDP) because of lower oil-related incomes (the emergency-related income hole is 2 % of GDP) and higher wellbeing related spending in 2020 (assessed to expand use by 0.6 % of GDP). The shortfall will slowly restrict to 5.9 % of GDP by 2022 as the economy recoups from the Coronavirus emergency and financial sector-related costs decreasing after 2020 (World Bank, 2019).

Ghana's poverty rate is extended to remain extensively unaltered over the medium term. In the current capital-escalated, asset overwhelmed economy, not many openings for work are accessible for the last 40% of the population. Because of the worldwide poverty line (\$1.9 every day-PPP), current rates will fall imperceptibly from 13.36 % in 2019 to 13.39 % in 2022.

## **CONCLUSION**

The COVID-19 pandemic has slowed down economic activity, maintained uncertainty, and adversely impacted global growth conditions in all around the world. Ghana Government has taken steps for the intention of following a 'market-based' economic policy, highly depending on private sector development. Sustainable macroeconomic stability will Ghana's main challenge. Even though Ghana had severe economic, issues of resource allocation are essential as regards to economic growth, how income is distributed among the people is also a matter of concern. Despite supporting the neoliberal perspective, Ghana allocates more significant parts of GDP and limited expenditure capacity to citizens in terms of education, health and active labor market policy efforts. It tends to be seen from the information that the nation is doing great in all areas yet little endeavours and approaches must be established to support speculator enthusiasm for the nation and improvement of the private area will go far to help in the advancement of the nation.

Ghana has relatively recently come out from a financial area tidy up that have to reestablish speculator and public trust in the area founded by the Bank of Ghana (Lowland). The licenses of troubled banks were re-inspected, some were combined. These issues provide reliability to the market by foreign investors. However, coronavirus pandemic has affected Ghana harshly like all countries' macroeconomic performance. Development is easing back down; even monetary and banking conditions have fixed. Moreover, as a low-income economy and after a severe economic crisis and now a pandemic, Ghana needs more contribution than average to FDI and private sector partnership with the help of globalization (neo-liberalization) policies.

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**RUH SAĞLIĞI VE PSİKİYATRİ HEMŞİRELİĞİ DERSİNİN SOSYAL BİR SORUN OLAN  
DAMGALAMAYA ETKİSİ**

**Hilal Seki ÖZ<sup>1</sup>, Didem AYHAN<sup>2</sup>**

<sup>1</sup> Dr. Öğr. Üyesi. Kırşehir Ahi Evran Üniversitesi, Bağbaşı Mah. Sahir Kurutluoğlu Cad. No: 100 Merkez (Bağbaşı) Yerleşke, Merkez/Kırşehir, Türkiye, [hilalseki@hotmail.com](mailto:hilalseki@hotmail.com), Orcid ID: (0000-0003-2228-9805)

<sup>2</sup> Dr. Öğr. Üyesi. Bandırma Onyedi Eylül Üniversitesi, İhsaniye Mah. Kurtuluş Cad. no: 98, Bandırma/Balıkesir, Türkiye, [kose.didem@gmail.com](mailto:kose.didem@gmail.com), Orcid ID: (0000-0001-6687-6564)

**ÖZET**

*Damgalama, ruhsal hastalığa sahip bireylerin toplum tarafından daha fazla önyargıyla karşılandığı, dışanma ve ayrımcılığa uğradığı sosyal bir sorundur. Damgalamayla mücadelede geleceğin hemşireleri olan öğrenci hemşirelerin mesleki eğitim sürecinde ruhsal hastalıklara yönelik olumsuz inançlarını farketmeleri ve olumlu yönde değişmesi önem kazanmaktadır. Bu araştırma ile bir devlet üniversitesinde 'Ruh Sağlığı ve Hastalıkları Hemşireliği' dersinin öğrenci hemşirelerin ruhsal hastalığa yönelik inançlarına ve şizofreniye yönelik bilgi düzeylerine etkisinin incelenmesi amaçlanmıştır. Kontrol grupsuz, ön test, son test müdehale çalışması olarak tasarlanmış bu araştırma, 2019-2020 güz döneminde gerçekleştirilerek araştırmaya katılmayı kabul eden 130 öğrenci ile tamamlanmıştır. Veriler; kişisel bilgi formu, Ruhsal Hastalığa Yönelik İnançlar Ölçeği (RHYİÖ) ve Şizofreni Hakkında Bilgi Düzeyi Ölçeği (ŞHBDÖ) ile toplanmıştır. Verilerin analizinde tanımlayıcı istatistikler, varyans homojenlik testleri, bağımsız gruplarda t testi ve tek tönü Anova analizi yapılmıştır. Dersin etkinliğini değerlendirmek için bağımlı gruplarda t testi, RHYİÖ ile ŞHBDÖ arasındaki ilişkiyi değerlendirmek için ise spearman korelasyon analizi yapılmıştır. Analizler sonucunda; öğrencilerin RHYİÖ'nden aldığı toplam puan ders öncesi olumsuz (51,67±14,66) iken, dersin sonrasında olumlu (44,54±15,11) olduğu, RHYİÖ'nün tüm alt ölçeklerinden alınan puanların anlamlı düzeyde düştüğü ve ŞHBDÖ toplam puanlarının da istatistiksel olarak anlamlı düzeyde arttığı saptanmıştır. Kadın olan, ders öncesinde ruhsal hastalığı olan bireye bakım vermeyen ve ders sonrasında ruh sağlığı alanında çalışmak isteyen öğrencilerin RHYİÖ toplam puanları ders öncesi ve ders sonrası ölçümlerde istatistiksel olarak anlamlı düzeyde düşmüştür. Bu sonuçlar doğrultusunda hemşirelik öğrencilerine verilen ruh sağlığı ve hastalıkları hemşireliği dersinin bireylerin ruhsal hastalıklara yönelik inançlarını olumlu yönde etkilediği ve şizofreniye yönelik bilgi düzeylerini arttırdığı söylenebilir ve dersin etkisinin kalıcılığını araştıran izlem çalışmalarının yapılması önerilebilir.*

**Anahtar Kelimeler:** Damgalama, Ruh sağlığı ve Hastalıkları Hemşireliği dersi, Hemşirelik öğrencisi, Şizofreni

**JEL Kodları:** I10, I19, I29.

**THE EFFECT OF MENTAL HEALTH AND PSYCHIATRIC NURSING LECTURE  
ON STIGMA AS A SOCIAL PROBLEM**

**Hilal Seki ÖZ<sup>1</sup>, Didem AYHAN<sup>2</sup>**

<sup>1</sup> Asst. Prof., Kırsehir Ahi Evran University, Kırsehir, Turkey, hilalseki@hotmail.com, Orcid ID: (0000-0003-2228-9805)

<sup>2</sup> Asst. Prof., Bandirma Onyedi Eylul University, Balıkesir, Turkey, kose.didem@gmail.com, Orcid ID: (0000-0001-6687-6564)

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**ABSTRACT**

*Stigmatization is a social problem in which individuals with mental illness are faced with more prejudice, exclusion and discrimination by society. In the fight against stigma, it is important for student nurses, who are the future nurses, to notice their negative beliefs about mental illnesses and change them positively during their vocational training. With this research, it was aimed to examine the effect of the 'Mental Health and Disease Nursing' course on student nurses' beliefs about mental illness and their level of knowledge about schizophrenia in a state university. This research, designed as a pre-test, post-test intervention study without a control group, took place in the fall semester of 2019-2020 and was completed with 130 students who accepted to participate in the study. Data was collected with; the personal information form, the Beliefs Toward Mental Illness Scale (BTMI) and the Level of Knowledge on Schizophrenia Scale (LKSS). Descriptive statistics, variance homogeneity tests, independent groups t test and one-way Anova analysis were used in the analysis of the data. In order to evaluate the effectiveness of the lesson, t-test was performed in dependent groups, and spearman correlation analysis was performed to evaluate the relationship between BTMI and LKSS. As a result of the analysis; While the total score the students got from the BTMI was negative ( $51,67 \pm 14,66$ ) before the lesson, it was positive ( $44,54 \pm 15,11$ ) after the lesson, the scores obtained from all the subscales of the BTMI decreased significantly and It was found to be statistically significant. BTMI total scores of students who are women, who do not care for individuals with mental illness before the lesson, and who want to work in the field of mental health after the lesson, decreased statistically significantly in the pre-lesson and post-lesson measurements. In line with these results, it can be said that the mental health and illness nursing course given to nursing students positively affects individuals' beliefs about mental illnesses and increases their level of knowledge about schizophrenia, and it can be recommended to conduct follow-up studies investigating the permanence of the effect of the course.*

**Keywords:** Stigma, Mental Health and Disease Nursing course, Nursing student, Schizophrenia

**JEL Codes :** I10, I19, I29.

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## **1. GİRİŞ**

Ruhsal hastalıklara yönelik damgalamanın tarihi ilk çağlara kadar uzanmakla birlikte günümüzde de devam eden sosyal bir sorundur. Damga (stigma) sözcüğü, bir kimsenin adını kötüye çıkartan, yüz kızartıcı işaret, durum olarak tanımlanmaktadır. Damgalama (stigmatizasyon) ise, kişinin içinde yaşadığı toplumun “normal” saydığı ölçülerin dışında sayılması nedeniyle, toplumu oluşturan diğer bireyler tarafından kişiye saygınlığını azaltıcı bir atıfda bulunulmasıdır. Damgalanan kişiye, damgalama nedeniyle, utanılacak, diğerleri tarafından reddedilme, çekinilme, beğenilmeme ile sonuçlanacak bir özellik yüklenmiştir (Ozer, Varlık, Ceri, Ince ve Arslan-Delice, 2017:224, Bilge ve Çam, 2010:71, Bostancı, 2005:32). Ruhsal hastalığa sahip bireylerin -özellikle Şizofreni hastalarının- damgalamadan en fazla etkilenen gruplardan olduğu, fiziksel bir hastalığa sahip olanlara göre, toplum tarafından daha fazla önyargıyla karşılandığı, dışanma ve ayrımcılığa uğradığı aktarılmıştır (Corrigan, Powell ve Michaels, 2013:179, Yang ve Parrott, 2018:553).

Damgalamanın sonucunda ruhsal hastalığa sahip bireyler ve yakınları toplumdan izole olmakta, benlik saygıları ve yaşam doyumları düşmekte, sağlık yardımı aramaktan ve tedaviye uyum göstermekten vazgeçebilmektedirler (Ross, Morgan, Jorm ve Reavley, 2019:11, Mıhçı ve Kızıuşar, 2010:32). Yapılan çalışmalarda ruhsal hastalığa yönelik önyargılı yaklaşımın egemen olduğu, bu nedenle ruhsal hastaların içselleştirilmiş damgalama ve utanç yaşadığı, toplumun ruhsal hastalara karşı yaygın şekilde olumsuz tutumlara sahip olduğu, özellikle alt ekonomik düzeydeki bireylerin bu hastalıkları daha çaresiz karşıladıkları ve tehlikeli gördükleri belirtilmiştir (Angermeyer ve Dietrich, 2006:163, Rüşch, Angermeyer ve Corrigan, 2005:529). Damgalamanın ve yarattığı olumsuz etkilerin önüne geçebilmek için başta ruh sağlığı ve hastalıkları profesyonelleri olmak üzere, toplumsal düzeyde bir farkındalık oluşturulmalı, damgalamayı engellemeye yönelik mücadelenin yürütülmesi gerekmektedir (Çam, Bilge, Engin, Akmeşe, Turgut ve Çakır, 2014:129).

Bu mücadelenin ön saflarında yer alan sağlık profesyonellerinin içinde varolduğu toplumun bir üyesi olduğu düşünüldüğünde, toplumla benzer inanç ve tutum özellikleri göstermeleri kaçınılmaz olmakta ve bu durum damgalama ile mücadeleyi olumsuz etkilmektedir. Yapılan çalışmalarda; psikiyatristlerin çoğunluğu ve psikiyatri dışı hekimlerin, çalışan hemşireler ve öğrenci hemşirelerin ruhsal hastalıklara karşı olumsuz tutumlara ve damgalamaya sahip olduğu saptanmıştır (Arkan, Bademli ve Duman, 2011:214, Yüksel ve Taşkın, 2005:13, Aker, vd. 2002:5). Sağlık profesyonelleri içinde hastaya 7/24 aralıksız bakım sunan, hasta ile yoğun terapötik ilişki kuran ve tedavi-rehabilitasyon sürecinde anahtar role sahip olan meslek grubu ise hemşireliktir. Hemşirelerin hasta ve hastalıklara ilişkin geliştirdikleri olumlu ya da olumsuz inançlarının, hastalara sunulan bakımın kalitesini etkilediği, klinikteki terapötik ortamın düzenlenmesinden taburculuk sonrası rehabilitasyona uzanan çerçevede belirleyici olduğu bilinmektedir. Bölge hastanelerinde çalışan hemşirelerin ruhsal

hastalıklara yönelik inançlarını inceleyen bir çalışmada hemşirelerin toplumdaki inançlara benzer şekilde olumsuz inançlara sahip olduğu; bu inançlarını “güvenlik algıları” ve “daha önce psikiyatri hemşireliği dersi veya eğitimi alma durumları” olmak üzere iki değişkenin etkilediği saptanmıştır (Çam ve Arabacı, 2014:13). Psikiyatri hemşirelerinin, psikiyatri dışı kliniklerdeki hemşirelerden daha olumlu tutumlar sergiledikleri, psikiyatri bilgi ve becerisine sahip olmanın önyargı ve yanlış inanışların önlenmesinde etkili olduğu vurgulanmıştır (Morgan vd.,2008:735).

Hastalara etkili bakımın verilmesi için hemşirelerin mesleki eğitim süreçlerinde sahip oldukları önyargı ve olumsuz inançlarını fark etmeleri, bunun etkisinden arınabilmeleri önemlidir. Hemşirelik lisans eğitim müfredatında yer alan Ruh Sağlığı ve Hastalıkları Hemşireliği dersi (RSHHD) ruhsal hastalıkları bilimsel olarak tanımayı, psikiyatri hemşireliğinin felsefesini, işlevlerini ve sorumluluklarını öğrenmeyi, psikiyatrik hastalıklara uygun hemşirelik bakımı sunabilmeyi, öğrenci hemşirelerin psikiyatrik hastalıklara karşı önyargı ve olumsuz inanç düzeylerini azaltmaya yönelik bilgi, beceri ve tutumları kazandırmayı hedeflemektedir. Bostancı ruhsal hastalıklara yönelik damgalamanın, ruhsal bozukluklar hakkındaki efsanelerin, yanlış anlamaların, olumsuz kalıplaşmış yargıların ve tutumların sonucu olduğunu ifade etmiştir (Bostancı, 2005:32). RSHHD kapsamında ruhsal hastalıklara yönelik bilimsel ve doğru bilginin sunulması, bakım sunarken empatik ve hümanistik bakış açısının kazandırılması, her insanın değişim potansiyelinin var olduğuna vurgu yapılması ile damgalama üzerine etkili olabileceği söylenebilir. Bu bilgiler ışığında damgalama ile mücadelede önemli bir yere sahip olan RSHHD’nin öğrenci hemşirelerin şizofreniye yönelik bilgi düzeylerine ve damgalama düzeylerine etkisinin belirlenmesi amaçlanmıştır.

## **2. GEREÇ ve YÖNTEM**

### **2.1. Araştırma tipi ve yöntemi**

Kontrol grupsuz ön test-son test kapsamlı müdahale çalışması olarak tasarlanan bu araştırmanın amacı, RSHHD’nin öğrencilerin damgalama ve şizofreniye yönelik bilgi düzeyleri üzerindeki etkisini incelemektir. 2019-2020 güz döneminde dersi alan öğrencilere ders öncesi testler yapılmış olup 14 haftalık eğitim öğretim dönemi sonunda testler aynı öğrencilere tekrarlanmıştır. Araştırmanın evrenini derse kayıt yaptıran 160 öğrenci oluşturmaktadır. Araştırma kapsamında örneklem seçimine gidilmemiş olup daha önce ruh sağlığı ve psikiyatri hemşireliği dersini almamış olan ve çalışmaya katılmaya gönüllü olan 138 öğrenci çalışmaya dahil edilmiştir. Bununla birlikte veri setinde eksik bilgisi olan sekiz öğrenci analiz dışında tutularak örneklem sayısı 130 olarak tamamlanmıştır.

### **2.2. Veri toplama araçları**

Kişisel Bilgi Formu: Katılımcıların sosyo-demografik özelliklerini belirlemek amacıyla araştırmacılar tarafından hazırlanan form dokuz sorudan oluşmaktadır.

Ruhsal Hastalığa Yönelik İnançlar Ölçeği (RHYİÖ): Ruhsal hastalığa yönelik inançları değerlendirmek için Hirai ve Clum tarafından 2000 yılında geliştirilen ölçeğin (Hirai ve Clum, 2000:221) Türkçe geçerlik-güvenirlik çalışması 2008 yılında Bilge ve Çam tarafından yapılmıştır (Bilge ve Çam, 2008:91). Çalışmada 6'lı likert tipteki ölçeğin Cronbach  $\alpha$  iç tutarlılık kat sayısı 0,82 olarak bulunmuştur. Ölçek ruhsal hastalığı olan bireylere ilişkin olumsuz inanç ve düşünceleri kapsayan “tehlikeli”, “çaresizlik ve kişilerarası ilişkilerde bozulma” ve “utanma” alt boyutlarından oluşmaktadır. Ölçekten ve alt boyutlarından alınan puanın yükselmesi ruhsal hastalığa ilişkin olumsuz inançların arttığını ifade etmektedir.

Şizofreni Hakkında Bilgi Düzeyi Ölçeği (ŞHBDÖ): Şizofreni hastalığı, nedenleri, prognozu, semptomları, tedavisi, görülme sıklığı gibi şizofreniye ilişkin bilgileri sorgulayan soruların yer aldığı ölçek Ascher-Svanum tarafından 1999 yılında geliştirilmiştir (Ascher-Svanum, 1999:561). Çoktan seçmeli 25 sorudan oluşan ölçekte her soruya verilmesi gereken bir doğru yanıt bulunmakta olup, doğru sorularadan alınan puan ile ölçek değerlendirilmektedir. Görkem-Atalan ve arkadaşları tarafından 2018 yılında türkçe uyarlaması yapılan ölçekte iki maddesi çıkarılarak 23 madde üzerinden değerlendirilmektedir (Görkem-Atalan, Karaoğlu-Kahiloğulları, Örsel, 2018:1). Ölçekten alınabilecek minimum puan 0, maksimum puan ise 23'tür. Çalışmada ölçeğin Cronbach  $\alpha$  iç tutarlılık kat sayısı 0,80 olarak bulunmuştur.

### **2.3. Veri Analiz**

Araştırmanın verileri SPSS 25.0 paket programında değerlendirilmiştir. Çalışmanın frekans, yüzde, ortalama değerlerini saptamak için tanımlayıcı istatistiksel analizler, varyans homojenlik testleri ve sosyodemografik verilerin ölçek puanları açısından değerlendirilmesi için bağımsız gruplarda t testi ve tek tönü Anova analizi yapılmıştır. Verilen eğitimin etkinliğini değerlendirmek için bağımlı gruplarda t testi, şizofreni hakkında bilgi düzeyi ile damgalama arasındaki ilişkiyi değerlendirmek için ise spearman korelasyon analizi yapılmıştır.

Araştırma Helsinki Bildirgesine uygun olarak gerçekleştirilmiş olup Kırşehir Ahi Evran Üniversitesi Sağlık Bilimleri Fakültesi Hemşirelik Bölüm Başkanlığından kurum izni alınmıştır. Ayrıca araştırmaya katılmaya gönüllü öğrencilerden yazılı ve sözlü onamları alınmıştır.

### **3. BULGULAR**

Araştırmaya katılan öğrencilerin %71,5'i kadın, %56,9'u şehirde ve %72,3'ü çekirdek aile düzeninde yaşamaktadır. Öğrencilerin %86,2'sinin ailesinde ruhsal hastalık öyküsü bulunmamaktadır. Ruh sağlığı ve psikiyatri hemşireliği ders dönemi öncesinde ruhsal hastalığı olan birine bakım verenler %12,3 iken ders döneminde bu oran %44,6 olarak bulunmuştur. Ayrıca ders öncesi ruh sağlığı alanında çalışmak isteyenlerin oranı %67,7 iken ders dönemi sonrası bu oran %84,6'ya yükselmiştir.



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Öğrencilerden ders işleme tekniklerini sıralamaları istendiğinde %34,6 teorik anlatım, %28,4 sinema (konuya ilişkin film gösterimi ve tartışma), %20,8 klinik uygulama ve %16,2 vaka tartışmasını tercih ettikleri bulunmuştur. Öğrencilerin yaş ortalaması ise  $21,85 \pm 1,045$  olarak bulunmuştur.

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**Tablo 1: Hemşirelik öğrencilerinin tanıtıcı özellikleri ile RHYİÖ ve ŞYBDÖ puanlarının karşılaştırılması (n=130)**

Tanıtıcı özellik.	N %	RHYİÖ (ÖNCESİ) X±SD	P	RHYİÖ (SONRASI) X±SD	P	ŞHBDÖ (ÖNCESİ) X±SD	P	ŞHBDÖ (SONRASI) X±SD	P
Cinsiyet <sup>a</sup>									
Kadın	93 71,5	51,27±14,29	0,625 t: -0,490	42,81±14,71	0,021* t: -2,336	16,10±2,70	0,371 t:0,898	18,88±2,15	0,004* t:3,011
Erkek	37 28,5	52,67±15,73		49,62±15,64		15,64±2,41		17,67±2,01	
Yaşanılan yer <sup>b</sup>									
İl	74 56,9	51,38±14,62	0,491 F: 0,715	43,43±14,51	0,203 F: 1,616	15,78±3,13	0,304 F:1,200	18,39±2,36	0,568 F: 0,568
İlçe	39 30,0	50,53±15,64		44,64±16,33		16,51±1,74		18,41±1,72	
Köy	17 13,1	55,52±12,62		50,76±15,23		15,58±1,62		18,53±2,29	
Aile tipi <sup>a</sup>									
Çekirdek aile	94 72,3	51,53±15,34	0,866 t: -0,170	44,72±15,51	0,971 t: -0,037	16,10±2,90	0,366 t:0,907	18,65±2,33	0,244 t: 1,173
Geniş aile	36 27,7	52,02±12,96		44,83±14,73		15,63±1,69		18,22±1,67	
Ailede ruhsal hastalık öyküsü <sup>a</sup>									
Var	18 13,8	50,33±14,50	0,678 t: -0,417	41,33±16,46	0,307 t: -1,026	15,61±2,47	0,527 t: -0,635	18,05±1,66	0,316 t: -1,008
Yok	112 86,2	51,89±14,75		45,30±15,04		16,03±2,65		18,61±2,24	
Ders dönemi öncesinde ruhsal hastalığı olan birine bakım verme durumu <sup>a</sup>									
Evet	16 12,3	50,50±14,83	0,734 t: -0,341	52,37±15,82	0,032* t: 0,607	15,06±2,11	0,138 t: -1,493	17,56±1,59	0,056 t: -1,930

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Hayır	114 87,7	51,84±14,70		43,68±14,92		16,10±2,67		18,67±2,21	
Ders döneminde ruhsal hastalığı olan birine bakım verme durumu <sup>a</sup>									
Evet	58 44,6	50,62±16,23	0,463 t: -0,736	44,89±15,20	0,924 t: 0,095	16,24±2,84	0,305 t:1,030	18,40±1,87	0,544 t: -0,609
Hayır	72 55,4	52,53±13,31		44,63±15,38		15,76±2,43		18,63±2,39	
Ruh sağlığı alanında çalışmak ister misiniz? (ders öncesi) <sup>a</sup>									
Evet	88 67,7	50,27±14,35	0,120 t:-1,567	43,90±14,66	0,362 t:-0,914	16,05±2,18	0,618 t:0,500	18,56±2,09	0,800 t:0,254
Hayır	42 32,3	54,57±15,05		46,52±16,42		15,0±3,40		18,46±2,35	
Ruh sağlığı alanında çalışmak ister misiniz? (ders sonrası) <sup>a</sup>									
Evet	110 84,6	51,03±14,83	0,251 t: -1,154	43,13±15,23	0,004* t: -2,919	15,80±2,38	0,072 t:-1,816	18,36±2,20	0,031* t:-2,182
Hayır	20 15,4	55,15±13,53		53,65±12,16		16,95±3,63		19,52±1,71	
Yaş	Ort ±SS= 21,85±1,045								

<sup>a</sup>independent t testi

p <0,05

<sup>b</sup>One way ANOVA testi

Hemşirelik öğrencilerinin cinsiyete göre ölçek puan ortalamaları karşılaştırıldığında kadın öğrencilerin dersi almadan önce  $51,27 \pm 14,29$  olan ruhsal hastalığa yönelik damgala puanı ders sonrası  $42,81 \pm 14,71$ 'e düşmüştür. Ayrıca bu öğrencilerin ders öncesi şizofreniye ilişkin bilgi puanları  $16,10 \pm 2,70$  iken ders sonrası bu puan  $18,88 \pm 2,15$  olarak bulunmuştur. Ölçekler arasındaki fark cinsiyete göre anlamlı bulunmuştur ( $p < 0,05$ ). Ders dönemi öncesi ruhsal hastalığı olan birine bakım vermemiş olan hemşirelik öğrencilerinin ruhsal hastalıklara yönelik damgalama puan ortalamaları ( $51,84 \pm 14,70$ ) ruh sağlığı ve psikiyatri hemşireliği dersini aldıktan sonra  $43,68 \pm 14,92$  olarak bulunmuş olup aradaki fark istatistiksel olarak anlamlı çıkmıştır ( $p < 0,05$ ). Ruh sağlığı alanında çalışmak isteyen öğrencilerin ruhsal hastalığa yönelik damgalama puanları ders öncesi  $51,03 \pm 14,83$  çıkmış olup, ders sonrası bu puan  $43,13 \pm 15,23$ 'ye düşmüştür. Aynı öğrencilerin şizofreniye ilişkin bilgi puanları ise  $15,80 \pm 2,38$ 'den  $18,36 \pm 2,20$ 'ye yükselmiştir ( $p < 0,05$ ).

**Tablo 2: Hemşirelik öğrencilerinin ders öncesi ve ders sonrası RHYİÖ puanlarının karşılaştırılması (n=130)**

Hemşirelik öğrencilerinin ders öncesi ve ders sonrası ruhsal hastalığa ilişkin damgalama durumları

		<b>DERS ÖNCESİ X±SD</b>	<b>DERS SONRASI X±SD</b>	<b>p</b>
<b>RHYİÖ ve ALT BOYUTLARI*</b>	Tehlikelilik	$22,72 \pm 5,85$	$18,89 \pm 6,32$	<b>0,000</b>
	Çaresizlik ve Kişilerarası İlişkilerde Bozulma	$27,56 \pm 9,46$	$24,72 \pm 9,59$	<b>0,000</b>
	Utanma	$2,62 \pm 1,97$	$0,88 \pm 1,64$	<b>0,000</b>
	Toplam	$51,67 \pm 14,66$	$44,54 \pm 15,11$	<b>0,000</b>

\*Paired sample t test

Tablo.2 incelendiğinde ders öncesi ölçek toplam puanı  $51,67 \pm 14,66$  iken ders sonrası ölçek toplam puan ortalaması ise  $44,54 \pm 15,11$  olarak bulunmuştur ( $p < 0,05$ ). Ölçek alt boyutlarından tehlikelilik puan ortalaması ders öncesi  $22,72 \pm 5,85$  bulunmuş olup ders sonrası bu ortalama  $18,89 \pm 6,32$  puana düşmüştür ( $p < 0,05$ ). Çaresizlik ve kişilerarası ilişkilerde bozulma alt boyut puanları ise ders öncesi  $27,56 \pm 9,46$  iken ders sonrası  $24,72 \pm 9,59$  olarak bulunmuştur ( $p < 0,05$ ). Ölçeğin utanma alt boyutu incelendiğinde ise ders öncesi  $2,62 \pm 1,97$  olan ortalama puan ders sonrası  $0,88 \pm 1,64$  olarak bulunmuştur ( $p < 0,05$ ).

**Tablo 3: Hemşirelik öğrencilerinin ders öncesi ve ders sonrası ŞHBDÖ puanlarının karşılaştırılması (n=130)**

	<b>DERS ÖNCESİ X±SD</b>	<b>DERS SONRASI X±SD</b>	<b>p</b>
<b>ŞHBDÖ *</b>	$15,86 \pm 2,27$	$18,53 \pm 2,17$	<b>0,000</b>

\*Paired sample t test

Hemşirelik öğrencilerinin ders öncesi ve sonrası şizofreni hakkında bilgi düzeyleri karşılaştırıldığında ders öncesi ölçek puan ortalaması  $15,86 \pm 2,27$  bulunurken ders sonrası öğrencilerin şizofreniye yönelik bilgi anketi puan ortalaması  $18,53 \pm 2,17$  çıkmıştır. Aradaki fark istatistiksel olarak anlamlı bulunmuştur ( $p < 0,05$ ).

**Tablo 4: Hemşirelik öğrencilerinin RHYİÖ ve ŞHBDÖ puanları arasındaki ilişki**

	<b>R</b>	<b>p</b>
Ders öncesi RHYİÖ ŞHBDÖ	-0,060	0,497
Ders sonrası RHYİÖ ŞHBDÖ	-0,080	0,367

RSHHD öncesi öğrencilerin ruhsal hastalığa yönelik inançları ve şizofreni hakkında bilgileri arasındaki ilişki incelendiğinde aralarında ters yönlü ilişki bulunmuş olup sonuçlar istatistiksel olarak anlamlı çıkmamıştır ( $p > 0,05$ ). Ders sonrası ölçek puanları arasındaki ilişki incelendiğinde ruhsal hastalığa yönelik damgalamaları azalırken şizofreniye ilişkin bilgilerinin arttığı bulunmuş, ancak bu ters yönlü ilişki istatistiksel olarak anlamlı çıkmamıştır ( $p > 0,05$ ).

#### **4. TARTIŞMA**

RSHHD'nin öğrencilerin ruhsal hastalıklara yönelik olumsuz inançlarına ve şizofreniye yönelik bilgi düzeylerine etkisini inceleyen bu çalışmada öğrencilerin RHYİÖ'nden aldığı toplam puan ders öncesi olumsuz ( $51,67 \pm 14,66$ ) iken, ders sonrasında olumlu ( $44,54 \pm 15,11$ ) olduğu, ŞHBDÖ toplam puanlarının da istatistiksel olarak anlamlı düzeyde arttığı saptanmıştır. Bilge ve arkadaşlarının çalışmasında ruh sağlığı ve hastalıkları dersini alan ebe öğrencilerin, dersi almayanlara göre daha olumlu inançlara sahip olduğu saptanmıştır (Bilge, Koçak, Akmeşe ve Sarıcan, 2012:302). Bir çalışmada sosyal hizmet bölümünde okuyan öğrencilere 14 hafta boyunca ruhsal hastalıklar hakkında bilgilendirme eğitimi verilmiş, eğitim öncesi-sonrası toplam RHYİÖ puanları karşılaştırılmış, çalışma sonucunda RHYİÖ tehlikelilik alt ölçeği ve toplam RHYİÖ puanlarının istatistiksel olarak anlamlı düzeyde azaldığını bulmuştur (Kara, 2015:69). Öztürk ve arkadaşlarının hemşirelik 3. ve 4. sınıf öğrencileri ile yaptığı çalışmada RSHHD'ni alan 4. sınıf öğrencileri ile dersi almayan 3. sınıf öğrencileri RHYİÖ toplam puanları bakımından anlamlı fark bulunmamış ve her iki sınıfın da ruhsal hastalıklara yönelik olumsuz inançlara sahip oldukları bulunmuştur (Öztürk, Kaçan-Softa ve Karaahmetoğlu-Ulaş, 2015:146). Literatür incelendiğinde araştırma sonuçlarına benzer sonuçlar olsa da, RSHHD'ni alan öğrencilerde damgalamaya yönelik inançlarında değişiklik olmadığı da görülmektedir. Çalışmada RSHHD'nin ruh sağlığı alanında uzmanlığı olan öğretim üyeleri tarafından

verilmesinin, dersin teorik anlatımına ek olarak vaka tartışması ve film gösterimleri ile desteklenmesinin, ayrıca bu alternatif öğretim tekniklerinin uygulama alanları yetersizliği nedeniyle psikiyatrik vakalara bakım sunamayan öğrencilerin de (Öğrencilerin sadece %44,6'sı uygulamalar esnasında psikiyatrik vakalar ile çalışabilmiştir) damgalamaya yönelik bilgi, beceri ve tutumlarının değişmesine katkı sağladığı söylenebilir.

Çalışmada kadın öğrencilerin dersi almadan önceki ve dersi aldıktan sonraki RHYİÖ toplam puanlarının anlamlı şekilde düştüğü, ŞYBDÖ puanlarının ise anlamlı düzeyde yükseldiği saptanmıştır. Günay ve arkadaşlarının yaptığı çalışmada hemşirelik öğrencilerinin RHYİÖ puanlarının yaş, cinsiyet, sınıf, RSHHD'nin uygulamasını yapma durumu gibi değişkenlerden etkilenmediği saptanmıştır (Günay, Bekitkol, Ekitli ve Yıldırım, 2016:129). Çalışmada kadın öğrencilerde RHYİÖ toplam puanlarının ders öncesi ve sonrasında anlamlı şekilde düşmesinin kadınların empatik yaklaşımlarının daha yüksek olmasıyla psikiyatrik olguların yaşadıkları sorunları daha iyi anlamasına bağlı olduğu, bunun da olumsuz inançların değişimine katkı sağladığı söylenebilir. Ders dönemi öncesi ruhsal hastalığı olan birine bakım vermemiş olan ve ruh sağlığı alanında çalışmak isteyen hemşirelik öğrencilerinin ruhsal hastalıklara yönelik damgalama puanları ders öncesi olumsuzken, ders sonrasında olumlu olduğu bulunmuştur. Psikiyatri kliniğinde çalışmaya yönelik hemşirelik öğrencilerinin görüşlerini inceleyen bir çalışmada öğrencilerin ruhsal sorunu olan bireye yardım amacıyla psikiyatri kliniğinde çalışmak istedikleri, bazı öğrencilerin ise ruhsal sorunu olan bireye yönelik korku-anksiyete hissetmeleri ve iletişim kurmakta güçlük yaşayabileceklerini düşünmeleri nedeniyle mezuniyet sonrasında psikiyatri kliniğinde çalışmak istemedikleri belirlenmiştir (Uzun ve Demir, 2017:172). Sosyal hizmet bölümü öğrencileri ile yapılan bir araştırmada 'Psikiyatrik Sosyal Hizmet' dersini almak, psikiyatri alanında çalışmayı istemek gibi değişkenlerin öğrencilerin damgalama düzeyleri üzerinde etkileri olduğu saptanmıştır (Akçay ve Küçükkaraca, 2017:27) Yapılan başka bir çalışmada ise RSHHD'ni alanların psikiyatri hemşireliğinin rol ve sorumluluklarını bildikleri ve damgalamaya yönelik mücadele çalışmalarında daha geniş vizyonları olduğu görülmüştür (Büyükbayram, Arabacı, Taş ve Kurt, 2020:263). Çalışmada RSHHD ile ruhsal hastalıkların ortaya çıkış sebepleri, hastalıkların tanı-tedavi-rehabilitasyon süreci, bakımda anahtar rolü olan psikiyatri hemşiresinin felsefesi, rol ve sorumlulukları teorik olarak paylaşılmış, farklı öğretim metotları kullanılarak teorik anlatım desteklenmiş, etkin tedavi ve bakımın verilmesiyle hastaların tedavi edilebilir, korkulması gerekmeyen ve iletişim kurulabilen bireyler olduğu ifade edilmiştir ve tüm bunların öğrencilerin var olan önyargılarının olumsuz inançlarının değişmesine katkı sağladığı düşünülebilir.

Hemşirelik öğrencilerinin RSHHD sonrasında RHYİÖ'nin tüm alt ölçeklerinde ders öncesine göre anlamlı düzeyde azalma olduğu saptanmıştır. Bu durum ruh sağlığı ve psikiyatri hemşireliği

dersinin ruhsal hastalıklara yönelik bilinci arttırdığı ve damgalamayı tüm alt boyutları ile birlikte anlamlı derecede azalttığı şeklinde yorumlanabilir. Bir çalışmada hemşirelik öğrencilerinin, hemşirelik bölümü dışındaki öğrencilere ‘damgalamayı önlemeye yönelik eğitim’ vermeleri ile, eğitim sonrasında RHYİÖ’nün tüm alt ölçek puan ortalamalarının anlamlı düzeyde düştüğü bulunmuştur (İnan, Günüşen, İnce ve Duman, 2020:142). Malas’ın ruhsal hastalıklara yönelik damgalama ile mücadeleye yönelik derleme çalışmasında toplumun farklı kesimlerindeki her bireye, ruhsal hastalıklara karşı verilecek bilgilendirme eğitimlerinin ruhsal hastalıkları damgalama konusunda daha olumlu sonuçlar alınacağı ifade edilmiştir (Malas,2019:1170). Çalışmada ders içeriğinde psikiyatrik tanısı olan bireylerin tehlikeli olma durumlarının hastalık yönetimiyle ilgili olduğu, psikiyatrik hastalıkların da fiziksel hastalıklar kadar normal hastalıklar olduğu, beden gibi ruhun da hasta olabileceği, etkili tedavi ve bakım ile bu hastalığa sahip bireylerin normal yaşantılarını sürdürebileceklerine vurgu yapılması ve sağlık ekibinin olumsuz tutumunun bakımın kalitesini-hastaların iyileşme potansiyelini düşüreceğinin ifade edilmesiyle birlikte ‘Guguk Kuşu’ ve ‘Patch Adams’ filmleri ile sağlık ekibinin davranışlarının hastalar üzerine etkisinin somutlaştırılmasının bu değişime katkı sağladığı söylenebilir.

Hemşirelik öğrencilerinin ders öncesi ve sonrası ŞHBDÖ puanları karşılaştırıldığında ise ders sonrasında anlamlı düzeyde artış olduğu saptanmıştır. Bir çalışmada şizofreniye yönelik bilgi düzeyini geliştirmek için uygulanan psikoeğitim sonrasında özel bakım merkezlerinde hizmet sunan görevli personelin verilen bilgilendirme öncesine ve kontrol grubuna göre, şizofreni hakkında daha fazla bilgiye sahip oldukları ve eğitim öncesi-sonrası değişiminin istatistiksel olarak anlamlı olduğu belirlenmiştir (Gökmen ve Okanlı, 2017:264). Başka bir çalışmada psikoloji bölümü ile tarih ve edebiyat bölümü öğrencilerinin ruhsal hastalıklara yönelik damgalama düzeyleri incelenmiştir. Çalışmada psikoloji bölümünde okuyan öğrencilerin daha fazla bilgi sahibi olsalar da, her iki bölümde okuyan öğrencilerin şizofreniye yönelik olumsuz tutumlar içinde oldukları ve şizofreni tanısı olan bireylere sosyal mesafe koydukları bulunmuştur (Malas ve Kırkpınar, 2019:101). Çalışmamızda ŞYBDÖ puanları anlamlı düzeyde atmıştır. Ön yargılı bakış açısına bilgi eksikliğinin, doğru olmayan bilgilere sahip olmanın ya da efsanelerin yol açabileceği düşünüldüğünde ruhsal hastalıklar içinde en fazla damgalamaya sahip olan şizofreni hastalığına yönelik ders içeriğinde geniş bir öğretim fırsatının olması, ders kapsamında şizofreni hastalığının iyi anlaşılmasına yardımcı olabilecek ‘Biz, Siz, Onlar’ belgeli ile ‘Akıl Oyunları’ filminin izletilmesi ve şizofreni tanısı olan bireylere yönelik vaka tartışmalarının yapılmasının, öğrencilerin bilgi düzeylerinin anlamlı olarak değişmesine katkı sağladığı düşünülebilir. Ruh sağlığı ve psikiyatri hemşireliği dersi öncesi ve sonrası öğrencilerin ruhsal hastalığa yönelik inançları ve şizofreni hakkında bilgileri arasındaki ilişki incelendiğinde aralarında ters yönlü ilişki bulunmuş olup, sonuçlar istatistiksel olarak anlamlı çıkmamıştır. Bu sonuç doğrultusunda ruhsal hastalığa yönelik inançları değiştirmede bilgi, tutum ve davranışların tamamının ele alınması gerektiği,

öğrencilerin hastalığa yönelik bilgi düzeylerinin artırılmasının fark yaratması söz konusu olsa da, yeterli olmayabileceği söylenebilir.

## **5. SONUÇ**

Çalışmamızın sonuçları doğrultusunda hemşirelik dördüncü sınıf öğrencilerine verilen RSHHD'nin bireylerin ruhsal hastalıklara yönelik inançlarını olumlu yönde etkilediği ve şizofreniye yönelik bilgi düzeylerini arttırdığı söylenebilir. Geleceğin hemşireleri olmaları ve bu hastalara birebir bakım sunacak olmaları nedeniyle ruhsal hastalıklara yönelik olumsuz inançlarının değişmesi hastalara sunulan bakımın kalitesini etkileyecek ve bu hastaların iyileşme sürecine olumlu katkı sağlayacaktır. Ruhsal hastalığı olan bireylere yönelik toplumsal tutumun değişmesinde, ilk olarak toplumda anahtar role sahip sağlık çalışanlarının bu alanda eğitilmesi, damgalama ile mücadelede önemli bir adım olabilecektir. Bu bağlamda hemşirelik eğitimi müfredatına öğrencilerin eğitimlerinin ilk yıllarından itibaren damgalamayı engelleyen derslerin konulması ve öğrencilerin ruhsal hastalıklara yönelik inançlarındaki değişimin kalıcılığının incelendiği uzun dönem araştırmaların yapılması önerilmektedir.

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**HİNDİSTAN İLE TÜRKİYE OTOMOTİV SANAYİNDE TARİHSEL GELİŞİM VE  
YENİLİKÇİ FİRMA OLUŞUMU**

**Sıtkı Selim DOLANAY<sup>1</sup>**

<sup>1</sup> Dr., Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi, İktisat, [selimdolanay@hotmail.com](mailto:selimdolanay@hotmail.com)

**ÖZET**

*Hindistan ve Türkiye otomotiv sanayi tarihsel gelişim çizgilerinin kimi benzerlikler göstermiş olduğu görülebilir. Benzerliklerin en başta geleni uygulanmış olan iktisat politikalarından kaynaklanmıştır diyebiliriz. Ancak, her ikisi de 1920'li yıllarda montaj usulüyle otomobil üretimine başlamış olan iki ülkenin otomotiv sanayi tarihsel gelişim sürecinin birbirinden farklı yanları, Hindistan'ın üretim hacminde Türkiye'yi büyük ölçüde geçmesini sağlamıştır denilebilir.*

*Hindistan Türkiye gibi benzer bir tarihsel geçmişe ve mirasa sahip olmuş ve her iki ülkede de otomotiv sanayi birbirine benzer olarak 1920'li yılların sonlarında oluşmaya başlamıştır. Türkiye iktisat politikaları ve teşvik sistemi aracılığıyla otomotiv sanayinin gelişimini yeterince destekleyememiştir. Hindistan otomotiv sanayi ise özellikle 1990'lı yıllarda liberalleşmeye yönelik iktisat politikası değişikliğiyle, büyük bir ivme kazanarak gelişmeye daha hızlı bir şekilde devam etmiştir.*

*Türkiye 1980'li yıllarda liberal iktisat politikaları uygulamaya başlamış olsa da, otomotiv sanayinde dış ticaret korumalarının kaldırılması ancak 1994 yılında Avrupa Birliği ile Gümrük Birliği uygulamasının başlamasıyla mümkün olabilmıştır. Ancak teknolojik gelişme sağlamaya yönelik bir yapı kurulamamış olduğundan, 1990'lı yıllarda otomotiv sanayi neredeyse sadece yabancı firmaların üretim ile ihracat yapabildiği bir yapıya bürünmüştür. Böylece otomotiv sanayi yabancı firmaların üretim üssüne dönüşmüştür diyebiliriz.*

*Türkiye 2000'li yıllara otomotiv sanayi üretim ve ihracatını artırarak girmişken, 2000'li yıllarda otomotiv sanayinde politika değişikliğine giderek yerli otomobil üretme kararı almıştır. Ancak yeni politika ile çelişkili bir şekilde otomotiv sanayinde yerli ürünler üretebilecek potansiyele sahip yenilikçi bir firma olan Uzel bir anlamda kösteklenmiştir. Zira Uzel firması 2010'lu yıllarda Türkiye'deki üretimini tamamen durdurarak Hollanda'da üretime devam etme kararı almış ve yaklaşık bir yıl sonrada ilk yerli traktörü üretmeyi başarabilmiştir.*

*Hindistan ise 1990'lı yıllardaki iktisadi liberalleşme politikası uygulaması ile bir yandan yabancı firmaları ülkesinde üretime teşvik etmişken, diğer yandan da yenilikçi firmaların ortaya çıkmasını sağlamıştır diyebiliriz. Sonuçta 2018 yılı itibariyle Dünya otomotiv sanayi üretiminde Hindistan beşinci, Türkiye ise 14. Sırada yer almıştır.*

**Anahtar Kelimeler:** Teşvik Sistemi, Otomotiv Sanayi, Yenilikçi Firma, Teknolojik Gelişme, Otomotiv Sanayi Üretimi,  
**JEL Kodları:** L98,N95,057.

**AUTOMOTIVE INDUSTRY HISTORICAL DEVELOPMENT AT INDIA AND TURKEY  
AND THE FORMATION OF INNOVATIVE COMPANY**

**Sitki Selim DOLANAY<sup>1</sup>**

<sup>1</sup>Dr., Süleyman Demirel University, Faculty of Economics and Administrative Sciences, Economics, selimdolanay@hotmail.com

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**ABSTRACT**

*When we look at the historical development of the automotive industry of India and Turkey, we find many common features and similarities. We can say that most similar ones originated from the economic policies. However, both in the 1920s which started the production of automobile with assembly method two country's automotive industry historical development process from each other different aspects, India's production volume had been provided to pass substantially Turkey's be said.*

*India and Turkey has a similar historical past and heritage and automotive industries in both countries has started to occur at the end of the year 1920 in similar ways. Turkey economic policies and incentive system was not encourage enough mediated by the development of the automotive industry. The automotive industry in India has continued to develop more rapidly, gaining momentum especially with the changes in the economic policy towards liberalization in the 1990s.*

*Turkey has begun to practice liberal economic policies with the removal of foreign trade protection, but the removal of foreign trade protection in the automotive industry became possible after with the inauguration of the Custom Union apply with European Union in 1994. However, since a structure for technological development could not be established, in the 1990s, the automotive industry almost embraced a structure that only foreign companies could manufacture and export. Thus, we can say that the automotive industry has turned into the production base of foreign companies.*

*Turkey entered the 2000s to the automotive industry by increasing the production and export, 2000s gradually amended the trends of economic policy local automobile production in the automotive industry has taken the decision. However in a way that is linked to the new policy, Uzel an innovative company with the potential to produce local products in the automotive industry, has been confused in a sense. Because the company Uzel be completely stopping production in Turkey in the 2010s, it had taken over production and the decision to continue in the Netherlands and about a year after Uzel has succeeded to produce first local tractor.*

*India, on the other hand, with the application of economic liberalization policy in the 1990s. On the one hand, we can say that while encouraging foreign companies to produce in their country, on the other hand, it enabled the emergence of innovative companies.*

*Ultimately As of 2018, industrial production of in India fifth in the automotive world, Turkey has taken the place of 14th.*

**Keywords:** Incentive System, Automotive Industry, Innovative Company, Technological Development, Automotive Industry Production,

**JEL Codes:** L98,N95,057

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## **1. GİRİŞ**

Gelişmekte olan ülkelere doğru olarak kabul edilmiş olan iktisat politikalarını benimsemeleri konusunda, gelişmiş ülkeler ve uluslararası kuruluşlar tarafından tavsiyelerde bulunmaktadır. (Chang, 2004: 15) Bunlar ise genel olarak serbest ticaret, ekonomik planlama, dış yardım finansmanı ve ithal ikameci sanayileşme politikalarının gelişme sürecinde uygulanması olarak özetlenebilir. (Chang, 2004: 15-28; Yiğidim, 2012: 3) Gerçekten de Türkiye 1963 yılında Dünya Bankasının politika önerilerine uygun olarak, içe dönük, korumacı ve ithal ikameci sanayileşme politikalarını benimsemiştir. (Yiğidim, 2012: 3) Aynı politika tercihleri 1950 ve 1960'lı yıllarda Hindistan için de geçerlidir diyebiliriz.

Diğer taraftan, dünyada eşitsiz ve ani ekonomik gelişmelerin nedenini ortaya çıkarmaya yönelik iki görüş ortaya atılmıştır. Birinci görüşe göre, az gelişmişlik içsel faktörlere bağlı olarak açıklanır. Bunlar sanayileşme için gerekli olan ve toplumdaki geleneksel-kültürel alışkanlıkları ön plana çıkaran unsurlardır. Bu görüşe modernleşmeci yaklaşım diyebiliriz. İkinci görüşe göre, az gelişmişliğin temel olarak nedeni sömürgecilik gibi ekonomik gelişme sürecini etkileyen dışsal unsurlara bağlanabilir. Bu yaklaşıma göre, az gelişmişlik 'ekonomik kalkışı' (take off) finanse etmek için gerekli kaynakların yokluğu ya da gerekli değer yargıları ve kurumların yokluğu gibi şartların varlığına bağlanır. Bu görüş ise bağımlılık okulunun yaklaşımını yansıtmaktadır. Modernleşmeci yaklaşıma göre, ülkelerin az gelişmişliği söz konusu olabilir, onlar geride kalmışlardır. Ancak, onlar sanayileşmiş ülkelerin geçmişte sanayileşirken izlemiş oldukları aynı yolu izlerlerse ekonomik gelişme gerçekleştirebilecektir. Modernleşmeci yaklaşım iki açıdan eleştirilmiştir. Birincisi, yaklaşım ekonomik gelişmenin ulusal üretimin artışına denk kabul edilmesidir. Bu yaklaşımı sınırlandırmakta ve nitelik ile demokrasi sorununun üzerini örtmektedir. Oysa ekonomik gelişme fiziki ve kültürel refahın artması ve nüfusun çoğunluğunun güvende olabilmesi olarak anlaşılmalıdır. İkincisi, yaklaşımın dünya ekonomik sisteminin karşılıklı bağımlılığa dayalı ve kazananlarla kaybedenlerin bulunduğu bir sistem olmasıdır. (Geijerstam, 2004: 17-18)

Teknoloji, insanların istek ve ihtiyaçlarını karşılayan makine, alet ve fiziki araç ve gereçlerdir. Araç ve gereçler insanların kullanım amacına göre yapılır. Dolayısıyla teknoloji her zaman insani bir çerçevede tanımlanır. Bu doğrultuda teknolojiyi sosyal ve kültürel şartlardan izole ederek anlamak mümkün değildir. (Geijerstam, 2004: 19)

## **2. Hindistan Tarihine Kısa Bir Bakış**

Hindistan tarihini üç döneme ayırarak incelemek mümkündür. Bunlar; Hindu egemenliği, İslam egemenliği ve İngiliz egemenliği dönemleri olmuştur. (Kılıçkap, 2007)

Hindistan tarihini dönemlere ayırmak suretiyle inceleme yaklaşımı doğrultusunda pek çok tarihçi Hindistan tarihini, Hindu egemenliği, İslam egemenliği ve İngiliz egemenliği dönemlerine

ayırarak incelemiştir. Ancak İslam egemenliği ve İngiliz egemenliği dönemlerinde Hindu kültür ve gelenekleri kaybolmadan korunabilmiştir. Her ne kadar Hindu egemenliği döneminde de Hindistan'ın homojen bir toplumsal yapısı olmasa da, (Kılıçkap, 2007: 25) Hindu döneminde ki kültürel dokunun 1947 tarihindeki bağımsızlık sonrasına aktarılabilmiş olması (Metcalf ve Metcalf, 2012), Hindistan da bilgi birikiminin de kesintiye uğramadan günümüze aktarılabilmiş olduğunu göstergesidir diyebiliriz.

Çakravartin'in kurmuş olduğu gibi Hindu egemenliği döneminde pek çok imparatorluk kurulmuş, bu imparatorlukların sonuncusu Gupta olmuştur. Ardından İslam egemenliği dönemine kadar pek çok beylik söz konusu olmuştur. (Kılıçkap, 2007: 26)

Müslümanlar ilk kez 8. Yüzyılda (712 yılında) Hindistan'a Muhammed bin Kasım komutasındaki ordu ile girmişler, Gaznelilerin Sultanı Gazneli Mahmud zamanındaki seferlerin neticesinde Muhammed Guri Han tarafından Hindistan'ın tamamının fethedilmesi söz konusu olmuştur. 1206-1290 yılları arası süreçte Memluklar, 1290-1320 yılları arası süreçte Halaciler, 1320-1413 yılları arası süreçte Tuğluklar ve 1413-1526 yılları arası süreçte de Ludiler Hindistan yönetimini ellerinde tutmuşlardır. 15. Yüzyıl başlarında Timur Han Hindistan yönetimini ele geçirmiş, daha sonra da onun soyundan gelen Babür Şah Babürlü İmparatorluğu'nu kurmuştur. Babürlü İmparatorluğu İngilizlerin işgaline kadar egemenliğini sürdürmüştür. Kılıçkap, 2007: 26-27; Metcalf ve Metcalf, 2012)

Hint medeniyetinin eski Mısır ve Mezopotamya uygarlıklarının ardından gelmiş olan dünyanın üçüncü en büyük ve eski medeniyeti olmuş olduğu kabul edilmiştir. Hint kültürünün yaşamış olduğu tüm olumsuzluklara karşın günümüze kadar bozulmadan gelmiş olduğu düşünülmektedir. Tümünde olmasa dahi Hindu egemenliğinin yanı sıra İslami yönetim geçmişte bu topraklarda hüküm sürmüştür. (Özsoylu, 2009: 113) Geçmişte Hindular büyük bir uygarlık oluşturmuş, ardından 13. yüzyılın başında İslami yönetim egemen olmuş, Babürlü İmparatorluğu'da İslami idare yöntemleriyle bölgede etkili bir uygarlık kurmuştur. (Metcalf ve Metcalf, 2012)

15. yüzyılda Avrupalıların Ümit Burnunu dolaşmak suretiyle Hindistan'a ulaşmış olmalarının peşinden Avrupa ile ilişkiye girmeye başlamış olan Hindistan'a, kimi Avrupa ülkeleri ticaret amacıyla ilgi duymaya başlamıştır. 15. Yüzyılın sonunda Vasco da Gama tarafından bulunmuş olan Hindistan kıtası ile ticaret 16. yüzyılın sonuna kadar, önceleri Portekizlilerin ve ardından da Hollandalıların egemenliği altında gerçekleşmiştir diyebiliriz. İngiltere ise 1600 yılında kurulmuş olan Doğu Hindistan Firması vasıtasıyla 1600'lü yıllarda Hindistan ile ticarete girişmeye başlamış, ilk olarak sadece Hindistan'ın malarba biberinin ithalatı yapılabilmektedir. (Metcalf ve Metcalf, 2012: 59-65) 1600 yılında Britanya Kraliçesi 1. Elisabeth bir Londra firması olmuş olan British East India Company (İngiliz Doğu Hindistan Firması)'ye İngiltere ile Hindistan ticari ilişkileri tekeli vermiştir. (Özsoylu,

2009: 113) 1617 yılında Babürlü Şahı Cihangir'in İngilizlere başta Gücerat eyaletinin Surat limanı olmak üzere kimi limanlarda antrepo hüviyetinde fabrikalar kurma izni imtiyazını vermesiyle ticaret gelişmiştir diyebiliriz. 17. yüzyılda baharat ticaretini bir kenara bırakmış olan İngilizler çivit ve güherçile gibi ürünler için Avrupa'da piyasa oluşturarak ticareti geliştirebilmişlerdir. 1660 yılı ile birlikte refah düzeyi artmış olan İngiltere'de halk basma, patika ve müslin gibi ürünleri de talep etmeye başlamış, böylece ticaret daha da gelişmeye başlamıştır. 1700 yılı itibariyle firma, Bombay, Madras ve Kalküta'dan oluşan üç başkent in ticaretini ele geçirebilmiştir. 1717 yılında İngilizler Babürlü İmparatoru Ferruhsiyer'den, Bengal'den getirmiş oldukları ürünleri gümrük vergisinden muaf olarak ihraç edebilme imtiyazını almış ve böylece Bengal'in zengin ve çeşitli malları Avrupa ve dünyanın geri kalanına rahatça gitmeye başlamıştır. Bu durum ayrıca İngilizlerin diğer ticaret yapmak isteyen ülkelere karşı üstün duruma geçmelerini sağlamıştır diyebiliriz. (Metcalf ve Metcalf, 2012: 59-65)

Karlarını sürekli olarak artırmaya odaklanmış olan Bengal'deki İngilizler, 18. Yüzyıl ortası itibariyle imparator tarafından kendilerine verilmiş olan serbest ticaret izni imtiyazını suistimal etmeye başlayarak, Hintlilere satmış ve imtiyazlar yasa dışı bir şekilde tahıl ve diğer malların iç ticaretinde kullanılmaya başlamıştır. Bengal'in yeni tahta çıkmış nevvabı (eyalet valisi) ise İngilizlerin Fransız saldırısına karşı Bengal'deki askeri gücünü artırmasının kendi egemenliğine yönelik bir hamle olduğunu düşünmüş ve Haziran 1756'da Kalküta üzerine yürümüştür. Sonuçta nevvabın birlikleri İngiltere garnizonunu hezimete uğratmış ve Kalküta'yı almıştır. Ancak nevvabın adamları savaşta esir düşen İngilizleri hava almayan bir odaya hapsederek bir gece içinde ölümlerine sebep olmuştur. Bu hadise tarihe Kalküta'nın Kara Deliği ismiyle geçmiştir. Bu hadisenin ardından Madras'tan gelen Robert Clive'a bağlı birlikler 23 Haziran 1757 tarihinde gerçekleşmiş olan Plassey savaşında nevvabı yenilgiye uğratarak Kalküta'yı geri almışlardır. Bu savaş sonrasında yenilen nevvabın yerine ise Mir Cafer nevvab yapılmıştır. (Metcalf ve Metcalf, 2012: 66)

Fransa ile savaş ve diğer hadiselerin ardından İngilizler Bengal'de de tuz, hurma, tütün, güherçile gibi değerli malların ticaretini ele geçirmeye başlamış, nevvabın egemenliği ise gözle görülür bir biçimde zayıflamaya başlamıştır. 1760 yılında nevvab değişmiş ve Mir Cafer'in yerine Mir Kasım geçmiştir. Böylece İngilizlerin Bengal yönetimine egemen olmasını istemeyen Mir Kasım hiç olmazsa Bihar'da İngilizlere mani olmak istemiştir. Ancak, kazanç elde etme ve servet biriktirme iştahları kabarmış olan İngilizler hiç bir kısıtlamayı kabul etmeye yanaşmamışlardır. Sonuçta Babürlü imparatoru ve Ayodhya nevvabı ile ittifak yapmış olan Mir Kasım'ın güçleri İngiltere'nin Doğu Hindistan firmasının güçleri ile 23 Ekim 1764'de savaşa tutuşmuştur. Ağır muharebe sonucunda İngilizler doğu Hindistan'ın efendileri olmuştur diyebiliriz. (Metcalf ve Metcalf, 2012: 66-68)



Bu askeri başarıdan sonra artık Britanya Doğu Hindistan firmasının sadece ticaret yapma kta olduklarını iddia etmesi mümkün olmamıştır. Firma 1765 yılında Babürlü İmparatoru ile Bengal, Bihar ve Orissa vilayetlerinin bir yıllık divaniliği (gelir toplama hakkı) üzerine anlaşma yapmıştır. Anlaşma firmayı yasal olarak hazine bakanı ve İmparator'un yardımcısı yapmıştır. (Metcalf ve Metcalf, 2012: 68)

1803 yılı itibariyle Pencap bölgesi dışında kalan tüm Hindistan İngiltere yönetimi altına girmiştir. (Özsoylu, 2009: 113) Ülke Maharaja, Mihrace veya Nevvab denilen ve sadece bölgesel gücü olabilen küçük prensliklerle idare edilmiştir. İngilizler ise daha çok demir, kömür gibi madenlerin işletilmesi, çay ve pamuk üretilmesi gibi para getiren ticari işlerle uğraşmışlardır diyebiliriz. İngilizler ayrıca Hindistan demiryolu ağını ve düzenli sulama kanallarını inşa etmişlerdir. (Özsoylu, 2009: 113)

Tabatabal'ın deyişiyle bu güçlenmeyle birlikte İngilizler, tüm Hindistan halkını hor görmeye başlamışlardır. 1824 yılında Doğu Hindistan'a tamamen yerleşmiş olan İngilizler, bununla da yetinmeyerek, Çin'i Avrupa ticaretine açmak için çabalamaya başlamışlardır. Temel amaçları Hindistan topraklarından elde ettikleri ürünleri, özellikle de afyonu Çin'e satabilmek olmuştur. (Mishra, 2013: 34-37)

Şah Alem döneminde (1759-1806) İngilizlerle önemli çarpışmalar olmuş ve sonuçta 1858 yılında Hindistan bir İngiliz sömürgesi olmuştur (Kılıçkap, 2007: 27-28; Clement, 1996)

İslam egemenliğinin son yıllarında, İngiliz egemenliğinin gittikçe artmış ve tüm ülkeyi kapsamaya başlamış olduğu bir dönemde, 1847 yılında Roorke Üniversitesi kurulmuştur. O yıllarda üniversitenin temel hedefi yenilikçi girişimciler yetiştirebilmek olmuştur. (Kılıçkap, 2007; [www.wikipedia.org](http://www.wikipedia.org))

### **3. 1900-1950 Yılları Arası Süreçte Hindistan Otomotiv Sanayindeki Gelişmeler**

İngiliz egemenliği altındaki Hindistan'da ekonomi son derece yavaşça büyümüştür. 1900-1914 yılları arası süreçte GSYİH %1.4 ve 1914-1947 yılları arası süreçte de yine %1.4 artmıştır. (Singh, 2018: 3)

Otomotiv sektörü öncelikle yurt dışından ithal otomobiller ile birlikte oluşmaya başlamıştır diyebiliriz. ABD'li General Motors tarafından Bombay'da 1928 yılında CKD (Completely Knock Down) yöntemiyle kamyon ve otomobil montajı yapmak üzere bir üretim tesisi kurulmuş, 1930-1931 yıllarında ise Kanadalı Ford Motor firması tarafından Madras, Bombay ve Calcutta'da montaj tesisleri kurulmuştur. 1942 yılında Hindustan Motor firması kurulmuş ve ilk araç 1950 yılında yapılabilmektedir. 1944 yılında Premier Automobiles Ltd. Inc. Firması kurulmuş ve ilk araç 1947 yılında üretilmiştir. Hükümet Bajaj Oto'nun tekerlekli çek çekten otomobil üretimine geçiş planını 1947 yılında kabul

etmiş ve birkaç yıl sonra da Piaggio lisansı ile montaja geçilmiştir. (Krishnaveni ve Vidya, 2015: 111-112)

#### **4. 1950-1990 Yılları Arası Süreçte Hindistan Ekonomisindeki Gelişmeler ve Otomotiv Sanayi**

1947 yılında Hindistan İngiltere'den bağımsızlığını kazanmış ve Hindistan ekonomisi için de yeni bir dönem başlamıştır. Nehru önderliğindeki Kongre Partisi'nin iktidara gelmesiyle uygulanacak iktisat politikası olarak Planlı Karma Ekonomik Model benimsenmiştir. Bu yeni dönem Sovyetler Birliği ekonomik modeline benzeyen ama Hindistan'ın geleneksel kültürel değerlerini dışlamayan bir dönem olmuştur. Yıllık %3-5 civarında ekonomik büyüme hızları ile yavaş bir ekonomik gelişme 1991 yılındaki liberalleşme programına kadar sürmüştür. Kapalı ekonomik yapıya karşın 1951 yılında Hindistan Teknoloji Enstitüsü kurulabilmiştir. Bu girişim ise 1970'li yıllarda Hindistan ekonomisi darboğaza girmiş olduğunda büyük fayda vermiştir diyebiliriz. (en.wikipedia.org; Cagliarini ve Baker, 2010)

1960'lı yıllarda iki ve üç tekerlekli, ayakla idare edilen arabalar otomotiv sanayinde görülmeye başlanmıştır. 1960'lı yılların başlarında Escorts ve Ideal Jawa alana giriş yapmışlardır. 1960 yılında Hindistan Otomobil Üreticileri Derneği (Association of Indian Automobile Manufacturers) kurulmuştur. 1955-1960 yılları arası süreçte sadece API moped üretmişken, 1960'lı yıllarda Mopeds India Ltd (1965), SZUL Gwalior (1964) ve Pearl Scooters Ltd'den oluşan üç firma daha alana girmiştir. 1965 yılında Standart Motors Products India Ltd ise ürün değişikliğine giderek, hafif ticari araçlar üretmeye başlamıştır. Escorts ve Enfield ise scooter üretim birimlerini kapatarak sadece motosiklet montajı yapmaya devam etmişlerdir. Scooter sektöründe ise 1960'lı yıllar boyunca Bajaj Oto Ltd ve API faaliyetini sürdürmüştür. (Krishnaveni ve Vidya, 2015: 112)

Hindistan tüketicileri için küçük yolcu otomobillerinin üretimi ancak, 1960'lı yılların sonlarında hükümet Maruti Ltd firmasına Yeni Delhi yakınlarındaki Gurgaon'da bir üretim tesisi kurmasına izin verince mümkün olabilmıştır. Firma otomobil işinde hiç tecrübe edinmeden pazara giriş yapmış, ancak firmanın sahibi olan Sanjay Gandhi, siyasette öne çıkmış bir aileden gelmekte olduğu için kamuoyunda büyük ilgi ve merak uyandırmıştır. Bir umut olmuştur. Ancak büyük umutlara karşın firmanın performansı oldukça zayıf kalmış, üretime 1977 yılında geçilebilmiştir. Diğer bir firma olan Sipani ise pazara 1976 yılında girmiştir. 1980'li yıllarda Hindistan otomobil üretimi 30.000 adet civarında kalmış ve Pazar HM, PAL, SMPI ve Sipani'den oluşan dört firmanın elinde olmuştur. İlerleyen yıllarda kötü Pazar performansına bağlı olarak SMPI ve Sipani firmaları kapanmıştır. (Chattopadhyay, 2013: 113)

1980 yılı öncesinde Hindistan yazılım sanayi neredeyse hiç yoktur. IT sanayi temel olarak donanım ürünlerinin ortaya çıkışıyla oluşmuştur. Bu sektör Hindistan hükümeti tarafından yüksek tarifeler ve lisans anlaşmaları ile korunmuştur. Hindistan hükümeti yazılım alanının döviz kazandırma potansiyelini görünce donanım ithaline, yazılım ihracına izin vermiş ve 1972 yılında yeni bir Yazılım İhracatı Şeması oluşturmuştur. TATA Danışmanlık hizmetleri 1974 yılında bu düzenlemeden yararlanan ilk firma olmuştur. (Singh ve Kaur, 2017: 2)

1972 yılında hükümet yeni bir yazılım ihracatı şeması oluşturmuştur. 1974 yılında Tata Danışmanlık Hizmetleri firması Hindistan'ın bilişim alanındaki ilk ihracatını gerçekleştirmiştir. 1980'lerde Hindistan'da donanım alanında gelişmeler yaşanmaya başlanmış, bu sıralarda yazılım sektörü hemen hiç bulunmamaktadır Hindistan'da .(Singh ve Kaur, 2017: 2)

Hindistan hükümeti IT/ITES sanayine yönelik bir dizi teşvik önlemi oluşturmuştur. IT ürünlerinin ithalatından alınan gümrük vergileri sıfırlanmış, İhracat Odaklı Birimler (Export Oriented Units-EOU), Yazılım Teknolojisi Parkları (Software Technology Parks-STP) kurulmuş, STP ve EOU'ler döviz kurları ile iç ve dış yatırımlardaki serbestleşmeyi kontrol için kurulmuş ve Özel Ekonomik Alanlar (Special Economic Zones-SEZ) IT sanayinin dünya ölçeğinde bir sanayi dalı haline gelmesi için geliştirilmiştir. Yıllar geçtikçe IT sanayi olgunlaşmış ve ekonomik büyümeye temel katkıyı yapar hale gelmiştir. IT sanayi alanında ilk yurt dışı işi ise TATA Danışmanlık Hizmetleri ABD'li Burroughs firmasından almıştır. Böylece 1966 yılında kurulmuş bulunan WIPRO ile 1981 yılında kurulmuş olan Infoys için de büyümenin yolu açılmıştır. Ancak 1991 yılındaki liberalleşme reformlarına kadar olan süreçte yurt dışı iş almak ise çok zor olmuştur. (Öz, 2007: 24-29)

Hindistan'ın yazılım ve bilgi teknolojilerine dayanmış olan hizmetler sektörünün kökenleri bağımsızlık sonrasında alınmış olan kararlara ve sonrasındaki gelişmelere dayanmıştır diyebiliriz. 1950'li yılların başlarında Massachusetts Teknoloji Enstitüsü (Massachusetts Institute of Technology-MIT) model alınarak Batı Bengal'de kurulmuş olan Hindistan Teknoloji Enstitüsü (Indian Institute of Technology-IIT) kurumu 1961 yılına gelindiğinde 5 adede yükselmiştir. (Öz, 2007: 24; en.wikipedia.org) Günümüzde 23 adede ulaşmış bulunan bu teknoloji enstitüleri (en.wikipedia.org) ile Hindistan Ulusal Yenilik Sisteminin çok erken bir tarihte oluşmaya başlamış olduğu düşünülebilir.

Yukarıda bahsettiğimiz enstitüler dünya standartlarında yetişmiş teknolojik iş gücünün çekirdeğini oluşturmuştur diyebiliriz. Ayrıca yurt dışında çalışmış olan ITT mezunları ve yurt dışında eğitim görmüş olanlar Hindistan bilgi teknolojileri sanayinin büyümesine katkıda bulunmuşlardır. Bu katkılar İKİ çeşittir. Birincisi, ITT mezunlarının eğitim kalitesi ve standartları onlara ABD, İngiltere ve birçok ülkede itibar kazandırmıştır. İkincisi, ITT ve diğer üniversite mezunlarından, yurt dışında çalışıp ülkelerine geri dönmüş olanları ya kendi firmalarını kurarak, ya da çok uluslu firmalarda

çalışarak yurt dışında kazanmış oldukları ek becerileri Hindistan bilgi teknolojileri sektörünün hizmetine sunmuşlardır. Örneğin Bangalore yazılım parkında bulunan çok uluslu firmaların bir çoğunun yöneticisi yurt dışından gelen Hintliler olmuş, daha küçük bir çok firmanın sahibi de ABD'de yaşayan Hintli girişimciler olmuştur. (Öz, 2007: 24-25)

1990'lı yıllara kadar bilgi teknolojileri politikasının odağında eğitimin yanında ağırlıklı olarak donanım var olmuştur. Hem üretimde hem Ar-Ge faaliyetlerinde ithal ikamesine odaklanılmıştır. 1990 yılı sonrasında ise önceki on yılda donanım sektörünün gelişmesiyle ortaya çıkmış kişisel bilgisayarlarla birlikte yazılım sektörü gelişmeye başlamıştır. 1980'li ve 1990'lı yıllardaki yazılım ihracatı ise Hintli firmaların yazılım personelinin ABD'deki firmanın ofisinde çalışması ile sağlanmıştır. (Öz, 2007: 25-26)

Hindistan'da 1960'lı yıllarda ortalama %4 oranında yıllık ekonomik büyüme sağlanmışken, bu oran 1970'li yıllarda %3, 1980 ve 1990'lı yıllarda %5.5 olmuştur. (Cagliarini ve Baker, 2010: 1)

Özel sektörün piyasada yapmak istediği her türlü yeni ve ek yatırımda izin alması için oluşturulmuş olan licence raj sisteminde 1985 yılı sonrasında adım adım kısıtlamalar kaldırılmaya başlanmıştır. 1985 yılında önce 25 adet sektör, ardından 1991 yılında ise ek altı sektör daha lisence raj kısıtlamalarından çıkarılmıştır. Benzer üretim bantlarına sahip ve yakın teknolojiler kullanılarak üretim yapılmakta olan alanlarda, özel firmaların sektör değiştirebilmelerine olanak tanınmıştır. Bu son uygulama ise teknolojinin yenilenmesine ve esnek üretime zemin hazırlamış, böylece verimlilik artmıştır diyebiliriz. Vergi sistemi kolaylaştırılmış ve anlaşılır hale getirilmiştir. 1980'li yıllar reform ve ekonomik dönüşüm yılları olmuş olsa da geçmişten kalma kimi yapısal özellikler devam etmiştir. Beş yıllık kalkınma planları hazırlanmaya ve ekonomik hedefler belirlenip, bu hedeflere ulaşmaya çalışılmıştır. (Özsoylu, 2009: 123-124)

Hindistan hükümetinin geçmişteki korumacı politikalarından 1980'li yıllarda liberalizasyona gitmesi ile birlikte, bir çok yabancı ortaklık otomotiv sanayine girmiştir. Pek çok Hintli firma da Japonlarla iş birliğine girmiştir. Andhra Pradesh Scooters Piaggio ile Vespa imali için, Hindustan Motors Ltd. Isuzu kamyonlarının üretimi için Japon Isuzu ile, All ise Leyland Vehicles Ltd. ile integral otobüs imali için ve Japon Hino Motors ile de W serisi motor imali için ortaklığa girmiştir. Telco Daimler Benz ile sözleşmesinin süresini uzattıktan sonra, kendisi Benz modelinin benzerini geliştirerek pazara sunmuştur. Hükümet beş yeni firmanın hafif ticari araçlar pazarına girişini onaylamıştır. Bunlar, DCM, Eicher, Swaraj ve Allywn olmuştur. Bunlar sırasıyla, Toyota, Mitsubishi, Mazda ve Nissan isimindeki Japon firmalarıdır. Diğer firmalar olan, Hindustan Motors Ltd., Premier Automobiles Ltd., Hindistan Standard Motor Üretimi ve Sipani Otomobilleri firmaları da pazara yeni modellerini sunmuşlardır. Ticari Araç üretiminde Ashok Leyland Ltd. ve Telco en büyük oyuncular

olmuşlardır. 1983-1984 yılları arasında Bajaj Tempo Ltd. Alman Daimler Benz ile hafif ticari araçlar üretiminde iş birliğine girmiştir. İlerleyen yıllarda lisanslama politikasında düzenlemeye gidilmiş ve bazı eski ürünler lisans kapsamından çıkarılmıştır.(Krishnaveni ve Vidya, 2015: 112-113)

Hindistan hükümeti otomobil imalini lüks ve zenginlere yönelik gördüğü için firmalar bu dönemde otobüs ve kamyon imaline yoğunlaşmıştır.

##### **5. 1990-2010 Yılları Arasında Hindistan Ekonomisindeki Gelişmeler ve Otomotiv Sanayi**

Hindistan için 1989-1991 yılları arası ekonomik istikrarsızlık yaşanmış olan bir dönem olmuş ve sadece 1991 yılı için yıllık plan yapılabilmektedir. Hindistan ekonomik istikrarsızlık döneminde ciddi bir döviz rezervi kriziyle karşılaşmış, döviz rezervi 1 milyar ABD Dolarına kadar düşmüştür. Bu ekonomik baskı altında ülkede sosyalist ekonomik yapıyı reforme etme riski alınmıştır. (<https://en.wikipedia.org>)

1991 yılında Hindistan hükümeti krizden çıkış için ekonomik liberalizasyon programını açıklamıştır. Programın amacı yurt içi üretim, dış ticaret ve diğer ekonomik faaliyetler üzerindeki çeşitli hükümet kontrollerini kademeli olarak kaldırmak olmuştur. Yeni Ekonomi Politikası ile pek çok sanayi dalının hükümetten lisans alma zorunluluğu sona erdirilmiştir. Haziran 1993 tarihinde ise Hindistan hükümeti yeni otomobil politikasını açıklamıştır. Buna göre Hintli firmalardaki yabancı sermaye oranı için otomatik onaylama %51'e kadar geçerli olmaya başlamış, üretim programının safhalara ayrılma uygulaması son bulmuş, gümrük vergi ve harçlarında indirimle gidilmiştir. Yeni politika belgesinde ayrıca otomobil sanayinde yenilikçiliğin önemi vurgulanmıştır. Yeni politika belgesi büyük ölçekli pek çok ABD, Avrupa, Japonya ve Güney Kore gibi yabancı ülkelerin otomobil firmasının da Hindistan pazarına girişini desteklemiştir. Hindistan pazarındaki yerel üreticiler olan HM, PAL, Telco (daha sonra ismi TATA Motors olmuştur) ve Hint-Japon ortaklığıyla kurulmuş olan Maruti Udyog Ltd. ve yeni yabancı firmalar arasında rekabet yoğunlaşmıştır. HM ve PAL Pazar paylarını korumak için mücadele etmek zorunda kalmışlarken, ticari araç pazarında büyük başarı elde etmiş olan Telco eskilerin yanında yeni rakiplerine karşı da başarısını koruma durumuyla karşı karşıya kalmıştır. Maruti %70'lik Pazar payı ile hakimiyetini sürdürmüş, ancak rekabetçi Pazar baskısı otomobil üreticilerini çevre ve güvenlik standartlarını gözetken ileri üretim teknolojilerini kullanmaya zorlamıştır. (Chattopadhyay, 2013: 114)

1990'lı yıllarda Hindistan hükümeti, ticaret, yabancı yatırımlar, döviz kuru, sanayi, finansal konular v.b. pek çok konudaki politikalarında radikal değişikliklere gitmiştir. 1991 yılında yeni Sanayi Politikası açıklanmıştır. Bu yeni düzenleme Licence Raj sisteminin sonunu getirmiştir ve otomobil sanayinin genişlemesine izin verilmiştir. 1997 yılında otomobil sanayi üzerinde olumlu etkisi olmuş olan Milli Otoyol Politikası oluşturulmuştur. Hindistan otomobil pazarı ve yolcu otomobilleri

liberalleşme politikasının etkilerine maruz kalmış, Daewo, Peugeot, General Motors, Mercedes-Benz, Honda, Hyundai, Toyota, Mitsubishi, Suzuki, Volvo, Ford ve Fiat gibi pek çok uluslararası firma Hindistan pazarına girmiştir. Pek çok firma kendi modeli araçlarla pazarda yer alırken, Telco ise yolcu otomobili ürün yelpazesine Indica'yı eklemiştir. Maruti'nin Classic, Alto ve Station Wagon dan oluşan, Ford'un Ikon'u ve Mitsubishi Lancer'in yeni modelleri pazara çıkmıştır. (Krishnaveni ve Vidya, 2015: 113)

1991 yılında kabul edilmiş bulunan Yeni Sanayi Politikası ile birlikte, yabancı yatırımlar üzerindeki pek çok kısıtlama kaldırılmış, 18 sanayi dalı hariç tüm sanayi dallarında izin mekanizması kaldırılmışken, otomotiv sanayinde Mayıs 1993'te kaldırılmıştır. Otomotiv sanayi dahil 34 sanayi dalında yabancı sermaye yatırımı izinleri otomatikçe bağlanmıştır. 1990'lı yılların liberal politikaları yeni rakiplerin pazara girişini, teknoloji alanında saçılım etkisinin hissedilmesini, Ar-G harcamalarının artışı ve firmaların kendi yenilikçi ürünlerini oluşturmalarının cesaretlendirilmesini sağlamıştır. Böylece yeni ürün oluşturulmasında geçen zaman kısalmıştır. ((Miglani, 2019: 451)

1999 yılında alınmış olan ikinci reform kararları ile hem ekonomik sorunları çözümlmek, hem de 1991 yılında başlamış olan ekonomik liberalleşme sürecini devam ettirmek amaçlanmıştır. Reform programı sonrasında mali disiplinde iyileşmeler gözlenmiştir. (Özsoylu, 2009: 131-132)

2001 yılında hükümet otomotivde ithal kotalarını kaldırmış ve %100 oranında doğrudan yabancı sermaye yatırımlarına izin vermiştir. Yolcu otomobillerinde tarife oranı %24'e indirilmiştir. Yüksek tarife oranları OEM'lerin geçmişte üretim tesisi kurmalarını güçleştirmişken, arz kapasitesini büyütme yönelik kurumsal destek, esnek yan sanayi ilişkilerinin kurulmasına öncülük etmiş, bu da yenilik yeteneğinin oluşmasına yardım etmiştir. Ayrıca Otomotiv Misyon Planı (2006-2016) (AMP 2016) açıklanmıştır. (Miglani, 2019: 451-452)

Geçmişte yüksek yerel katkı oranları zorunluluğu getirilmiş olması, pazardaki firmaları koruyucu bir sanayi politikası olmuş, bu politika temel üretim kapasitesinin oluşumuna ve otomotiv parça sanayinin kurulmasına yardım etmiştir. 1980'li yılların ve 1990'lı yılların koruyucu politikaları ise temel üretim kapasitesini oluşturmuştur diyebiliriz. %70 üzerinde yerel katkı zorunluluğu OEM'leri ve parça üreticilerini küresel standartlarda üretim yapacak tesisler için sermaye yatırımı yapmaya yöneltmiştir.. Yerelleşme politikası teknolojik yeteneğin elde edilmesinin temel unsuru da olmuştur diyebiliriz. Yerel üreticilerle ana firma mühendislerinin işbirliği içinde çalışmak zorunda kalmaları Hintli firmaların teknolojik yetenek kazanmalarına öncülük etmiştir. Hükümetin tarife politikalarına ek olarak plan çerçevesinde yol ağı geliştirilmiş, özel amaçlı limanlar oluşturulmuş, mevcut Ar-Ge merkezlerinin niteliği artırılmış ve elektrikli ile hybrid araçların üretimi teşvik edilmiştir. (Miglani, 2019: 452)

2000 yılıyla birlikte pek çok temel politikada değişiklik yapılmıştır. Nicelik sınırlaması kaldırılmış, %100 doğrudan yabancı yatırımlar onayı otomotige bağlanmıştır. Tamamen yerel koşullarda üretilmiş, Hindistan malı otomobillerin yerel pazarda satılması ve ihracatı desteklenmiştir. Daha sonraki yıllarda ise sanayinin uzun vadeli gelişimine yönelik olarak hükümet Otomotiv Misyon Planı (2006-2016)'nı açıklamıştır. Hindistan dünya otomobil üretiminde 2002 yılında 15. Sırada iken, 2012 yılında 6. Sıraya yükselmiştir. 2011 yılı itibariyle dört büyük küresel oyuncu toplam üretimin %80'ini kontrol eder durumda olmuşlardır. Hindistan 2008 yılındaki ekonomik krize rağmen, bu güç yıllarda pozitif büyüme göstermişken, on yıllık süreçte otomobil sanayi sağlıklı büyüme çizgisini korumuştur. Bahsi geçen on yılda sadece Çin Hindistan'dan daha iyi bir performans göstermiş, otomobil üretiminde 2009 yılında Japonya'yı geçerek dünya liderliğine oturmuştur. (Chattopadhyay, 2013: 114-115)

#### **6. 2010 Yılı Sonrasında Hindistan Ekonomisindeki Gelişmeler ve Otomotiv Sanayi**

On ikinci beş yıllık plan (2012-2017) döneminde, yıllık ortalama ekonomik büyüme hızı %8 olmuştur. ([https://www.mospi.nic.in>default>files: 7](https://www.mospi.nic.in/default>files: 7))

Ağır Sanayi Birimi tarafından hazırlanmış olan Taslak Ulusal Otomotiv Politikası 2018 ile otomotiv ürünleri ihracatının toplam üretimin %35-40'ına çıkarılması hedeflenmiştir. Ulusal Elektrik Hareketliliği Misyon Planı 2020 2013 yılında kabul edilmiş ve kirlilik ile gaz emisyonunun azaltılmasını hedeflemiştir. (Miglani, 2019: 459-460)

Otomotiv Misyon Planı (2016-2026) (Automotive Mission Plan- AMP 2026) açıklanmıştır. 2016 yılı itibariyle dünya otomotiv üretiminde 5. sırada olmuş olan Hindistan, 2026 yılı itibariyle 3. sırada yer almayı hedeflemiştir. (Miglani, 2019: 445-453; OICA)

#### **7. Türkiye Tarihine Kısa Bir Bakış**

Osmanlı Devleti'nin kuruluşundan itibaren ilime çok büyük önem verilmiş, bilgi ve teknoloji transferi konusunda da hassas davranılmıştır. (İnalçık, 2017; Dolanay ve Oğuztürk, 2019) Nitekim ilk Osmanlı Medresesi Orhan Gazi tarafından 1331 yılında İznik'te kurulmuştur. (Özilgen, 2009: 21)

Osmanlı Devleti'nin kuruluşundan (1299) Fatih Sultan Mehmet'in tahta çıkmış olduğu 1451 yılına kadar geçmiş olan 1.5 yüzyıllık sürede medreselerin kurulması ve eğitim gereken önemin verilmesiyle, Osmanlı Türkleri arasında bilimsel açıdan kimi gelişmeler olmuştur. Bununla birlikte, Fatih Sultan Mehmet'in tahta çıkmasının ardından müspet ilimlerde ve bilimsel düşüncedeki gelişimin hızlanmış olduğunu söyleyebiliriz. (Hazırlayan, Aksoy, 2008: 31)

Ancak akli ilimler konusunda önemli alimlerden Molla Lütü'nin idam edilmiş olduğu 1495 yılı sonrasında, akli ilimlere verilen önemin azalması ile birlikte, bilgi ve teknoloji transferi süreci kesintiye uğramaya başlamıştır. (Dolanay ve Oğuztürk, 2019; Zelyut, 2019; Pala, 2019) Savaşlarda

alınan yenilgiler yüzünden askeri alanda yurt dışından getirilmiş olan eğitimci eliyle transfer süreci canlandırılmaya çalışılmış, 1734 yılında Comte de Bonneval tarafından hendesehane (geometri okulu) açılmış (Özilgen, 2009: 40) ve bu okula ilmiye sınıfı tarafından destek verilmiştir (Cihan, 2014: 136). Zira Medrese çıkışlı, ilmiye sınıfı mensubu Mehmet Said Efendi okulun ilk müderrislerinden olmuştur. Baron de Tott'un gayretleriyle 1773 yılında kurulmuş bulunan mühendishanenin ilk hocaları ise Cezayirli Seyyid Hasan ve Seyyid Osman Efendiler olmuştur. İlk ders veren Avrupalılar ise Baron de Tott ile İskoçyalı Kompell olmuştur. (Cihan, 2014: 140) Sultan 3. Selim zamanında yapılmaya başlanan yenileşme hareketleri çerçevesinde, Sultan'ın çevresinde müspet ilimlerden anlayan ve Batı dillerinden tercüme yapabilen küçük bir grup oluşturulmuştur. Bilgi transferi süreci 1833 yılında kurulmuş bulunan Tercüme Odası ile hızlanmıştır. (Karpat, 2006: 24 ve 27) 1862 yılında Osmanlı Bilimler Akademisi kurulmuş ve 1863 yılında ise sonradan Üniversite olarak kabul edilecek olan Darülfunun kurulmuştur. (Özilgen, 2009: 63) Cumhuriyet yönetiminin Darülfunun'u kapatmak istemesinin en önemli nedenlerinden biri ise bilimsel özerklik gerekçesi ile Darülfunun'un oluşturulmak istenen yeni tarih tezi ve yapılmış olan dil reformu ile ilgilenmemiş olmasıdır (Erdem, 2012: 381; Cihan, 2014: 136). 1933 yılında yapılmış olan Üniversite Reformu ile bu kez bir daha geçmiş bilgi birikimiyle bağlantı kurabilmiş olan ve Medrese'den gelmiş olan bilgi birikimini kısmen taşımış olan Darülfunun kurumu tamamen ortadan kaldırılarak Batı normlarında eğitim vermesi istenen Üniversiteler kurulmuş ve eski Darülfunun eğitimcilerinin yerine çoğu yabancı kökenli yeni eğitimci getirilmiştir. Darülfunun'un 157 öğretim üyesi siyasi ve ideolojik kriterlerle dışarıda bırakılmış ve akademik kriterler gözetilmemiştir. Üniversitede bilimsel özerklik kalmamıştır diyebiliriz. Ek olarak Osmanlı eğitim sisteminin bilgi birikimini tamamen silebilmek amaçlı olduğu anlaşılan ve yeni tarih tezini oluşturmayı hedefleyen Dil, Tarih ve Coğrafya Fakültesi 1935 yılında kurulmuştur. (Erdem, 2012: 380-386) Öğretim üyelerinin belli dönemlerde üniversiteden uzaklaştırılmaları Cumhuriyet'in sonraki yıllarında da gerçekleşmiştir. Böylece üniversiteler yurt dışından transfer edilmiş bilgileri öğrencilerine aktaran, yani bilgi transferi yapan kurumlar olarak kalmışlardır.

Osmanlı klasik dönem zamanında Medreseler örgün eğitim işlevini çok iyi bir şekilde yerine getirirken, akli ilimlerin Medreselerden dışlanması ile birlikte bu kurumlar sadece dini bilgileri yani nakli ilimler öğreten kurumlar haline gelmeye başlamıştır. Ancak bu köklü kurumlar, her ne kadar akli ilimleri dışlamış olsalar da güçlü kütüphanelerinde mevcut bulunmuş olan akli ilimlerle ilgili önceki dönemlerde yazılmış kitapları öğrencilerin alıp okumasına mani bir durum keşfedilmemiştir. Böylece akli ilimler dışlandıktan sonra dahi Medreselerden Hezerfan Ahmet Çelebi ve Lagari Hasan Çelebi gibi teknoloji geliştirebilenler çıkmıştır. (Dolanay ve Oğuztürk, 2018; Dolanay ve Oğuztürk, 2019;



Cihan, 2014) Böyle olmasının nedenini ise Medreselerin içinde bulunduğu toplumun sosyokültürel ve sosyo-ekonomik yapısı ile uyumlu kurumlar olmasında aramak gereklidir diyebiliriz.

Medreselerin son döneminde, Medrese'den yetişmiş Mustafa Sabri gibi alimler Medreseleri savunarak, eğitim geleneğinin korunması suretiyle değişim ve reform yapılmasını önermişler ve bir anlamda bu köklü eğitim kurumlarını yaşatmaya çalışmışlar, ancak başaramamışlardır. Zira Osmanlı'nın son dönemlerinde de dinsel eğitim veren kurumlar olarak görülmüş olan Medreseler. Cumhuriyet döneminde ötekileştirilmiş ve kapatılmıştır. (Cihan, 2014: 123-126) Ancak medreseler her zaman Batı tarzındaki yeni okulları desteklemişler. 1734 yılında kurulmuş olan Hendesehane, 1773 yılında kurulmuş olan Mühendishane-i Bahri Humayun ve 1796 yılında kurulmuş bulunan Mühendishaneyi Berri Hımayun'un eğitim kadrolarında ilmiye mensupları yer almıştır. (Cihan, 2014: 135-145)

#### **8. 1923-1960 Arası Süreçte Türkiye Otomotiv Sanayinde Gelişim**

Hindistan gibi Türkiye otomotiv sanayi de çok erken tarihlerden itibaren oluşup, gelişmeye başlamış olmasına karşın, günümüzde Hindistan otomotiv sanayinin Türkiye'ninkinden gelişmiş durumda olmuş olması. Türkiye'nin sanayiye teşvik konusunda yeterince iyi sanayi politikaları oluşturamamış olmasının ve teknoloji geliştirme yeteneği kazanılmasında etkili olabilecek yenilikçi firma çıkaramamış olmasının bir sonucudur diyebiliriz.

Osmanlı zamanında 1838 yılında İngiltere ile yapılmış olan ticaret anlaşması sonrası sanayi büyük oranda zarar görmüştür. (Pamuk, 1994: 17-22) Bu nedenle Kurtuluş Savaşı sonrası 1923 yılında toplanmış olan İzmir İktisat Kongresi'nde hızlı sanayileşmenin özel sektör eliyle sağlanması, özel sektörün sermayesinin yeterli olmadığı durumlarda devletin devreye girmesi kararlaştırılmıştır. Bu çerçevede 1929 yılında Ford Motor firması tarafından İstanbul Tophane'de kamyon ve otomobil üretmek üzere bir montaj tesisi kurulmuştur. Ancak, dünya ekonomik bunalımı ve yabancı sermaye düşmanlığı nedeniyle bu tesis kısa sürede kapanmıştır. (Pamuk, 1994: 17-22; Keyder, 1993: 80-84; Dolanay ve Oğuztürk, 2018) 1950'li yıllarda lisans altında askeri jeep montaj tesisi ile otomotiv sanayi tekrar üretebilmeye başlamıştır diyebiliriz. 1923-1950 yılları arası süreç ve hatta 1958 yılındaki ekonomik krize kadar olan süreç hızlı ekonomik büyüme yılları olmuş ve sanayi sektörü gelişmiştir.

1929 yılında açılmış olan ilk tesisin ardından lisans anlaşması yolu ile farklı otomotiv ürünleri alanlarında üretim tesisleri kurulmuştur. (Dolanay, 2017; Dolanay ve Oğuztürk, 2018: 227-251)

1958 yılında öncü bir girişim olan Gümüş Motor, tarım ve su motorları imal etmek üzere, Çekoslovak Skoda lisansı ile Necmettiğn Erbakan tarafından İstanbul Rami'de kurulmuştur. Tesisin açılışını zamanın Maliye Bakanı Hasan Polatkan 1960 yılının Mart ayında yapmıştır. (Şimşek, 2020: 67)

#### **9. 1960-1980 Arası Süreçte Türkiye Otomotiv Sanayinde Gelişim**

1960'lı yıllara gelindiğinde otomotiv sanayinde farklı motorlu araçların montaj yolu ile üretimi gerçekleştirilebilirken, henüz otomobil üretim tesisi kurulmamış durumda olmuştur. Ancak, 1961 yılında Türkiye'nin ilk yerli otomobili prototipi 4 ay gibi kısa bir sürede imal edilebilmiştir. Proje başarılı olmuş olmasına karşın seri üretime geçilememiştir. (Şimşek, 2006; Dolanay, 2017; Dolanay ve Oğuztürk, 2018: 251-275)

1966 yılının sonuna doğru ise Koç Grubu tarafından çoklu lisans yöntemi (Otomobilin kaportası fiberglas malzemeden İngiliz Reliant firmasının lisansı ile, motor ve şanzımanı ise ABD'li Ford Motor'dan alınarak) Anadolu otomobillerinin üretimine başlanabilmiştir. Koç Grubunun bu girişimi ise ihracatın düşünülmemiş olması ve yanlış malzemeden kaporta imal edilmiş olması nedenlerinden dolayı kalıcı ve devamlılığı olan bir başarı hikayesine dönüşmemiştir. 1971 yılında ise İtalyan Fiat lisansı ile TOFAŞ ve Fransız Renault lisansı ile de OYAK Renault tesisleri kurulmuştur. (Dolanay ve Oğuztürk, 2018; Şimşek, 2020: 204)

1970'li yıllarda üretimi başlamış olan TOFAŞ Kuş serisi ile bir anlamda yaratıcı taklit aşamasına geçilebilmiş, ancak sonradan inovasyona dönüşebilecek bir gelişme yaşanmamıştır. (Küçükerman, 2000; Dolanay ve Oğuztürk, 2018)

Bunun ise teknoloji geliştirme yeteneğinin kazanılmasına yol açabilecek yeterli bilgi birikiminin oluşmamış olmasından kaynaklanmış olduğu düşünülmüştür.

1963 yılında yayınlanmış olan Montaj Sanayi Talimatı ile bir anlamda ithal ikameci sanayileşme stratejisi ile kalkınma modelinin sanayiye teşvik politikaları oluşturulmuştur. Bu düzenleme ile amaç ithal otomotiv ürünleri parçaları benzerlerinin yerel koşullarda üretilebilmesi olmuştur. Seçici olmayan teşvik sistemi ile yabancı ürünlerin kalitesiz kopyalarının üretilebilmesinin yolu açılmıştır diyebiliriz. (Azcanlı, 1995; Dolanay, 2017; Dolanay ve Oğuztürk 2018: 251-275)

Yeni kurulmuş olan fabrikalarla birlikte otomotiv sanayi üretim hacmi artmıştır. Ancak, 1961 yılında başarılı bir şekilde imal edilmiş Devrim otomobili prototipinin seri üretime geçmesini engellemek için DPT (Devlet Planlama Teşkilatı) tarafından verilmiş olan “otomobil üretimi Türkiye için lükstür, kamyon üretimine yönelmesi gerekir” şeklindeki sonucu içeren raporun da gereği yapılmamıştır diyebiliriz. (Şimşek, 2006; Şimşek, 2020)

Bir taraftan piyasada müşterilerin taleplerini alıp, kotalara göre yurt dışından ithalat yaparak büyük karlar elde eden kolaycı mümessiller, diğer tarafta ise üretimi ve ülkenin ekonomik kalkınmasını düşünen insanlar söz konusu olmuştur. Mümessiller ülkenin ziraat memleketi olarak kalıp ithalatın devam etmesinden yana olmuşlardır. Hatta bu ithalatçı çevreler 1964 yılında Gümüş Motor'un kapanacağı söylentisini yaymak suretiyle firma hisselerini ucuza almışlar ve ellerindeki

hisse adedi %61'e ulaşınca firmanın ismini değiştirerek Pancar Motor yapmışlardır. Yönetimde Pancar Ekicileri Kooperatifi söz sahibi haline gelmiştir. Alman Hatz firması ile lisans anlaşması yapılmıştır. Benzinli ve hava soğutmalı motorların da üretimine başlanmıştır. Ürün sağlam ve kullanıcı ihtiyaçlarına uygun olduğu için çok tutulmuş, 1980'li yılların başına kadar işler yolunda gitmiştir. 1980 yılı öncesinde tarımın devlet desteği almış olmasının bu başarıda payı olmuştur diyebiliriz. (Şimşek, 2020: 69-70)

1970'li yılların ikinci yarısından itibaren otomotiv sanayi üretimi düşmeye başlarken, ithal ikameci sanayileşme stratejisi de döviz darboğazı nedeniyle 1970'li yılların sonunda büyük bir ekonomik krizin oluşumunu hazırlamıştır diyebiliriz. (Dolanay, 2017; Dolanay ve Oğuztürk, 2018: 276-283)

24 Ocak 1980 tarihinde açıklanmış olan ekonomik istikrar programı ile birlikte, ekonomide istikrarı sağlamak için yapılmış olan büyük çaplı devalüasyon ile birlikte Türk Lirası'nın değeri yabancı paralar karşısında düşürülürken, aynı zamanda büyük bir ekonomik dönüşümün ilk temelleri atılmıştır diyebiliriz. Zira ilk defa ihracat yapma gerekliliği vurgulanırken, aynı zamanda ihracata dayalı büyüme modeline geçilebileceği anlaşılmıştır. (Azcanlı, 1995; Dolanay, 2017; Dolanay ve Oğuztürk, 2018: 284-301)

#### **10. 1980-2000 Arası Süreçte Türkiye Otomotiv Sanayinde Gelişim**

1980'li yıllarda tüm otomobil üreticileri ürün çeşitlendirmesine gitmiş ve 1980 yılında yaşanmış olan ekonomik krizden etkilenmemeye çalışmışlardır. (Dolanay ve Oğuztürk, 2018)

Sanayi politikası tercihi olarak 1983 yılından sonra ihracata dayalı büyüme modeli uygulanmaya uygulanmaya devam etmiş, bu doğrultuda da teşvik sisteminde değişikliğe gidilmiş, ihracat teşvikleri gündeme gelmiştir. (Dolanay ve Oğuztürk, 2018: 284-301)

1984 yılında kabul edilmiş olan İmalat Sanayi Yönetmeliği ise Montaj Sanayi Talimatı'ndan farklı olarak nitelik gelişimini ön plana çıkarmıştır. (Azcanlı, 1995) Bir anlamda o ana kadar yurt dışından ithal edilen teknoloji ile gelişmiş olan otomotiv sanayinin teknolojik gelişmeyi sağlaması gerektiği belirlenmiş ve buna ek olarak 1983 yılında yayınlanmış olan ilk Bilim ve Teknoloji Raporu ile de teknolojik gelişmenin gerekliliği ulusal düzeyde vurgulanmıştır. (Dolanay ve Oğuztürk, 2018: 284-301)

1983 yılından itibaren başlayan ekonomide liberalleşme uygulaması ile birlikte dış ticarete libere edilmeye başlanmış, otomotiv sanayini yurt dışı rekabetinden koruyan korumacı gümrük tarifeleri de kaldırılmış, ancak otomotiv sanayi dış rekabete açılmaya henüz hazır olmadığı için fon uygulaması getirilmiştir. (Dolanay ve Oğuztürk, 2018: 284-301)

1980’i takip eden yıllarda, Pancar Motor’un üretim verimi yavaş yavaş düşmeye başlamış, kapasite artmamaya ve hatta yıldan yıla düşmeye başlamış, yükselen maliyetler ve artan rekabet neticesinde Pancar Motor gücünü yitirmeye başlamıştır. 1990’lı yılların başından itibaren zarar eden bir firma haline dönüşmüş olan Pancar Motor, iflastan sürekli elindeki varlıkları satarak kurtulma yoluna gitmiştir. 1994 yılında da arazisini bir kısım hissedarına satmak zorunda kalmıştır. (Şimşek, 2020: 70)

1980 ve özellikle 1990’lı yıllar bilim ve teknoloji konulu rapor ve kitapların çoğaldığı, teknoloji geliştirmeye yönelik kurumların oluşturulduğu yıllar olmuştur. 1993 yılında ikinci Bilim ve Teknoloji Raporu yayınlanmış ve 1963 yılında TÜBİTAK (Türkiye Bilimsel ve Teknik Araştırma Kurumu)’ın kuruluşunun ardından 1990’lı yıllarda TUBA (Türkiye Bilimler Akademisi) gibi, TTGV (Türkiye Teknoloji Geliştirme Vakfı) gibi kurumlar kurulmuştur. Ancak, ulusal yenilik sistemini oluşturmaya yönelik bu çabalara karşın, otomotiv sanayinde yurt dışından teknoloji alarak gelişmeyi sağlama yaklaşımı devam etmiştir. (Dolanay ve Oğuztürk, 2018; Göker, 2013)1980’li ve özellikle de 1990’lı yıllarda bilim ve teknoloji konusunda ortaya konmuş olan dokümanlarda belirlenmiş olan hedeflerde genelde gerçekleştirilememiştir. (Göker, 2013)

Türkiye 1994 yılında Dünya Ticaret Örgütü (DTÖ)’ne üye olmuş ve 1996 yılında Avrupa Birliği (AB) ve Türkiye arasında Gümrük Birliği (GB) anlaşması imzalanmıştır. Böylece anlaşmalar doğrultusunda doğrudan parasal teşvikler ortadan kaldırılmış ve uluslar arası taahhütlere ters düşmeyecek şekilde ihracata yönelik devlet yardımları yürürlüğe girmiştir. (www.iibfdergisi.ksu.edu.tr: 2-3)

1990’lı yıllarda Honda, Toyota ve Hyundai firmaları tarafından Türkiye’de üretim tesisleri kurulmuş ve 1994 yılında AB ülkeleri ile Gümrük Birliği’ne gidilmesi ile birlikte Türkiye’den AB ülkelerine otomobil ihracatı artmıştır. (Dolanay ve Oğuztürk, 2018)

#### **11. 2000 Sonrası Süreçte Türkiye Otomotiv Sanayinde Gelişim**

2000’li yıllarda da 1990’lı yıllardaki eğilim devam etmiş ve ulusal yenilik sistemi daha da gelişmiş bir kurumsal yapıya kavuşmuş, ulusal yenilik sisteminin yasal çerçevesini oluşturan yasalar yayınlanmıştır. (Dolanay ve Oğuztürk, 2018: 310-333, 368-385)

2001 yılında yaşanmış olan ekonomik krizin ardından, 2002 yılından itibaren 2008 yılına gelinceye kadar Türkiye’de ciddi yıllık ekonomik büyüme hızlarına ulaşılmıştır. Bu dönem otomotiv sanayinde de Gümrük Birliğinin ve yabancı firmaların OEM yatırımlarının sonuçlarının görülmeye başlandığı bir dönem olmuştur.

Ancak, Hyundai 2006 yılında kurmak istediği ikinci fabrika için istediği teşvikleri alamayınca Türkiye ile anlaşamamış ve bu yatırımı Çek Cumhuriyeti’nde yapmıştır. (www.hurriyet.com.tr)

Böylece Türkiye otomotiv sanayinde bir politika değişikliği yaşanmış ve Türkiye kendi yerli otomobilini üretme kararı almıştır. Bu politika değişikliği neticesini ancak 2018 yılının Aralık ayında verebilmiş ve TOGG tarafından yerli otomobil prototiplerinin tanıtımı yapılmıştır. 2020 yılının temmuz ayında ise fabrikanın temeli atılmıştır. ([www.linkedin.com](http://www.linkedin.com); [www.odd.org.tr](http://www.odd.org.tr))

Otomotiv Sanayinde 1990'lı yıllarda açılmış olan üç adet otomobil üretim tesisinin getirmiş olduğu canlılığa ve gelişime karşın, 2000'li yıllarda yeni otomobil üretim tesisi kurulmamış olduğu gibi, 2006 yılında Hyundai'nin Türkiye'de ikinci bir fabrika kurma isteği istenen teşvikler verilemeyince geri çevrilmek zorunda kalınmıştır. (Dolanay ve Oğuztürk, 2018: 310-333, 368-385; [www.hurriyet.com.tr](http://www.hurriyet.com.tr))

2006 yılında kaçırılan bu yatırım fırsatının ardından, 2009 yılında Tata Motor Türkiye'ye yatırım yapmayı planlamış, ancak bu yatırım gerçekleşmemiştir. 2010'lu yıllarda yerli otomobil üretimine yönelinmiş, 2015 yılında ise yerli otomobil prototipinin imal edilmiş olduğu açıklanmıştır. Ancak kamuoyundan gelen tepkilerden sonra yerli otomobil üretimi işi ihale edilmiş. İhaleyi alan Türkiye'nin Otomobili Girişim Grubu, 2020 yılında ilk prototipin imal edileceğini ve 2022 yılında da seri üretime geçilebileceğini duyurmuştur. (<https://www.togg.com.tr>; <https://www.haberturk.com>)

Ancak, 2015 yılında ilk yerli otomobil prototipi ortaya çıktıktan sonra seri üretime geçiş için 2022 yılının belirlenmiş olması, bu alandaki patika bağlılığını kırmamanın ne kadar zor bir iş olduğunu göstermiştir. Üstelik bu durum hükümeti Volkswagen ile anlaşarak Türkiye'de otomobil fabrikası kurmasını sağlamaya yöneltmiş ve hükümet kendi teknolojisini geliştirerek yerli otomobil üretmek ya da yabancı otomobil markalarının Türkiye'de fabrika kurmaları için gerekli teşvikleri sağlama ikilemi arasında kalmıştır diyebiliriz.

Hükümetin bu ikilemi ise, Osmanlı döneminde bilgi ve teknoloji transferini durdurup içe kapanma ile tekrar bilgi ve teknoloji transferini başlatıp kendi teknolojisini geliştirebilme çabasına dönme ikilemini hatırlatmıştır. Zira Osmanlı İmparatorluğu, önce Molla Lütü gibi yabancı bilimsel gelişmelerden yararlanıp, yerel bilgi üretimine katkıda bulunmaya çalışan bir ilim adamını idam ettirip, ardından aynı yeteneklere sahip ilim adamı yetişmeyince ileri ülkelerden bilim adamı getirterek ileri ülkelerin kurumlarının ülkelerinde kurulmasına çalışmıştır. (Uludoğan, 2015: 3-5; <http://blog.milliyet.com.tr>; Ültanır, 2017; İhsanoğlu, 1992; Wiener, 1992)

1867 yılından başlayarak Rusçuk'ta, 1870'li yıllarda Bursa'da seri üretim tekniği ile at arabası üretimi yapmış olan Uzel firması, sonraki yıllarda parça üreticisi ve traktör montajı yapan bir firma olarak üretimine devam etmişken, 2009 yılında ilk yerli traktörü üretmeyi başarmıştır. Ancak bu yenilikçi ve girişimci firma sonraki yıllarda iflastan kurtulamamıştır. (Dolanay ve Oğuztürk, 2018: 216; [www.hurriyet.com.tr](http://www.hurriyet.com.tr); [www.haberler.com](http://www.haberler.com)>Ekonomi) Ancak, 200 yılında yerli otomobilimizi

üreteceğiz diyerek büyük çaplı politika değişikliğine gittiğini ifade eden hükümet, Uzel firmasının yenilikçi faaliyetlerine devam etmesini sağlayamamıştır. Şubat 2011’de yerli otomobil üretilmesi isteği hükümetçe firmalara bildirilmiştir. Yine Hacettepe Üniversitesi teknoparkında 2015 yılında prototipi imal edilmiş olan ilk yerli elektrikli otomobil ise yeterli destek bulamamış olduğu için seri üretime geçilememiş ve proje Devrim otomobilleri projesinin akıbetine uğrayarak iptal edilmiştir. (youtube; Şimşek, 2020: 202-205)

2010 yılının başlarında Pancar Motor biraz toparlanmaya başlamış, iflasla ilgili riskleri atlattmış ve küçük çaplı bir sermaye artışına gidebilmiştir. Bu doğrultuda borçların bir kısmı da ödenebilmiş ve günün koşullarına uygun olan daha düşük maliyetli bir yerli motor üretimi işine girilmiştir. Daha önce ithal edilmiş bir motor tamamen yerli koşullara göre uyarlanarak 10 ay gibi kısa bir sürede Pancar Motor tarafından düşük fiyatlı ve yüksek performanslı bir şekilde tamamen yerli olarak üretilmiştir. Aralık 2010’da bayilerde bu yerli motor satılmaya başlanmıştır. Anzi savaşlarına firmanın zayıf bünyesi dayanamamış ve 2011 yılı Aralık ayında üretime son verilmiştir. (Şimşek, 2020: 70-71) Böylece Pancar Motor’da Uzel firmasının akıbetine uğramış, yenilikçi bir firma daha piyasadan yok olmuştur.

Hindistan’ın Kerela Eyaletindeki Thiruvananthapuram kenti 2005 yılında teknopark gelişim sürecinin dördüncü safhası olarak bir teknokent olarak tasarlanmış ve teknokentin inşaatı halen sürmektedir. Bu teknokentin dünyanın beşinci en büyük Nissan Küresel Dijital Kümelenme Yerleşkesi olması düşünülmüştür. (en.wikipedia.org) Türkiye’de 2016 yılı itibariyle mevcut olan 64 teknoparktan sadece 51 tanesi işler durumda olabilmektedir. Diğerleri geliştirilme aşamasındadır. (Yıldız, 2016: 48)

### **Sonuç**

Hindistan yıllarca İngiliz sömürge yönetimi altında kalmış olmasına karşın 1947 yılında bağımsızlığını kazandıktan sonra hemen 1951 yılında Hindistan Teknoloji Enstitüsü’nü kurmuş ve teknolojik gelişmeye verdiği önemi göstermiştir. Bu enstitüler günümüzde 23 adede ulaşmıştır. İngiliz sömürge yönetiminden kurtuluşla birlikte ekonomik ve siyasi olarak sosyalist uygulamalara yaklaşan Hindistan, buna karşın yazılım alanında 1970’li yıllarda bilişim alanında sağlanan gelişmeleri desteklemiş ve 1974 yılında Telco Danışmanlık Hizmetleri ilk yurt dışı işini almıştır. 1980’li ve 1990’lı yıllarda önce donanım ardından yazılım alanında gelişim sağlanmıştır. 1991 yılından itibaren kapsamlı liberalleşme uygulamalarının ardından otomotiv sanayide gelişmeye başlamış, 1970’li yılların deneyimiyle Telco yani TATA Motor otomotiv alanındaki en yenilikçi firmalardan biri olabilmektedir.

Hindistan İngiliz sömürge dönemlerinden itibaren otomotiv sanayini kurmaya başlamış ve korumacı dış ticaret politikasına karşın otomotiv sanayi çıktılarının ihracata yönelik olarak

üretilemesiyle sanayi gelişmeye başlamış, 1991 yılı sonrasında liberalleşme ve yabancı sermayeyi çekme politikalarıyla birlikte TATA gibi yenilikçi bir firmanın oluşumu ile birlikte sanayi çok daha hızlı gelişme göstermiş ve patika bağıllığını kırarak yani kendinden önce otomotiv sanayini geliştirmeye başlamış ülkelerin geçmiş sanayileşme politikalarını benimseyerek gelişme yöntemini değiştirerek, Türkiye’den çok daha ileri gitmiş bir otomotiv sanayine sahip olabilmektedir.

Türkiye’de ilk otomobil üretim tesisi 1929 yılında Ford Motor firması tarafından kurulmuş, 1950’li yıllarda da otomotiv alanında montaj üretim tesisleri kurulmuştur. Ancak Türkiye’nin ilk yerli otomobili 1961 yılında prototipi üretilmiş olan Devrim otomobili olmuştur. Anadolu ise çoklu kaynaktan teknoloji transferi üretilmiş ve üretimi 1984 yılına kadar sürmüştür. 1970’li yıllarda üretimi başlamış olan TOFAŞ Kuş serisi ile bir anlamda yaratıcı taklit aşamasına geçilebilmiş, ancak sonradan inovasyona dönüşebilecek bir gelişme yaşanmamıştır. Bunun ise teknoloji geliştirme yeteneğinin kazanılmasına yol açabilecek yeterli bilgi birikiminin oluşmamış olmasından kaynaklanmış olduğu düşünülmüştür. 1924 yılında geçmişin bilgi birikimini taşıyan Medreselerin kapatılması ve ardından 1933 yılındaki üniversite reformu ile geçmişin bilgi birikimini taşıyabilecek olan öğretim üyelerinin görevden uzaklaştırılması ile geçmiş bilgi birikimi tamamen ortadan kaldırılmıştır. 2018 yılı Aralık ayında prototipi tanıtılmış olan yerli otomobilin ise çoklu kaynaktan teknoloji transferi ile üretileceği anlaşılmıştır. Bu ise Güney Kore’nin 1975 yılında ulaşmış olduğu seviyeye yeni ulaşılabilmiş olduğunu göstermiştir.

Türkiye 1960’lı yıllardan itibaren kendine özgü bir otomotiv sanayi kurmaya çalışmış, ancak bir türlü kendine özgü bir patika oluşturamamış ve patika bağıllı bir gelişmeye razı olmuştur. Otomotiv sanayi üretiminde Hindistan’ın çok gerisinde kalmıştır. 2006 yılındaki politika değişikliği ile yeniden kendi patikasını oluşturmaya yönelik Türkiye geç kalmış olmanın ve teknolojik gelişmeye yeterince önem vermemiş olmasının sancısını çekmektedir diyebiliriz. Ancak, 2015 yılında alınan doğru bir kararla yerli otomobil üretimi için işe başlanmış ve yabancı sermayenin ülkeye daha büyük oranda çekilebilmesi için teşvik sistemi duruma uygun hale getirilme çabası başlatılmıştır.

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