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Journal of Economic Cooperation & Development

Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC)

Contents

Editorial

The eight papers published in this issue revolve around contemporary macroeconomic states of various countries in Europe, Africa, and Asia. The papers study convergence and causality among economic variables, collective socioeconomic preferences and consequences, and contemporary growth of Islamic Finance sector. Specific recommendations include large-scale structural reforms and economic diversification, control of real exchange rates based on energy sector, allocation of foreign direct investment, reduction of debt-to-GDP ratio, satisfaction of retirement, evolution of waqf, and resilience of Islamic Finance sector during the COVID-19 pandemic.

The first paper investigates the spatial and temporal variations in economic growth and productivity of the Middle East and North African countries over the period 1970-2014. The results suggest that, in most oil-based economies, growth rates of per capita GDP and per worker GDP are quite meagre due to rapid growth in population and labour force (both nationals and immigrants). Convergence is also found in per worker GDP and per capita GDP. The study points to large-scale structural reforms and economic diversification to create sustained long-run growth.

The second paper examines the impact of crude oil import prices on household natural gas prices in Turkey. The household sector natural gas prices are chosen as a dependent variable while crude oil import price and real exchange rate are chosen as independent variables. Results show that short-run and long-run crude oil import prices affect natural gas prices positively while the real exchange rate affects it negatively. Although no causality was found between crude oil and household natural gas prices, it is concluded that unidirectional causality exists between the real exchange rate to natural gas prices.

The third paper inspects the reason for the existence of convergence of per capita income of member state in Southern African Development Community SADC. The stochastic convergence approach (unit root and cointegration technique) revealed that there was convergence in real per capita income towards South Africa's income in nine countries (Madagascar, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia, and Zimbabwe) but divergence in five countries (Angola, Botswana, DR Congo, Lesotho, and Malawi). Foreign direct

investment (FDI) was identified as the most common determinant of convergence in all SADC countries except Zimbabwe. Other determinants include economic growth, fiscal deficit, inflation, and openness to trade.

The fourth paper examines the government debt and economic growth nexus in Jordan from 1990 to 2017 by estimating the debt-growth threshold. Empirical results show that a threshold effect exists in the gross government debt and economic growth relationship. In addition, the relationship between gross government debt and economic growth is contingent on the debt-to-GDP ratio. In conclusion, policymakers should reduce the debt-to-GDP ratio through efficient allocation of financial sources by reducing government-funded programs to attain a higher growth rate and curb the effects of shocks such as the financial crisis.

The fifth paper analyzes the adequacy of retirement preparation of two different age groups: the hippie cohort (born between 1946 and 1954) and the X and Y cohort (born between 1965 and 1987). For the hippie cohort, regarding internet use for obtaining information to make decisions about investments and saving, positive effects were found on satisfaction of retirement income from pensions and Social Security. These results were statistically insignificant in the X and Y cohorts. Furthermore, the hippie cohort is also more likely to be satisfied with their retirement income from pensions and Social Security.

The sixth paper explores the transition certain nations are making from command economy to free-market economy, and the consequential socioeconomic reforms. The effect of the transformation on the countries through the capital channel was investigated by examining the effect of foreign direct investments on transition economies in the context of economic growth. The results show that when countries are evaluated as a whole, foreign direct investments can affect the economy only in the long term. An example of this can be seen in Slovakia, Slovenia, and Hungary.

The seventh paper shows the evolution of waqf from its conventionality based on cash and/or real estate. He studies that nowadays, there is a need to establish a business entity so that the assets and the shares are declared as waqf so that the dividends will be benefiting the designated beneficiaries. Socially, the implementation of this can create social funds which can push laws and regulations that can strengthen the operationality

and efficiency of waqf companies. In turn, this can become inclusive within an economy and reduce poverty and produce jobs in the industry. The research of this is relatively new and further research is on way to see the enhancing potential of waqf companies.

The eighth paper observes the contemporary state of Qatar; the pandemic and the ongoing political blockade of Qatar have really hurt the economy as well as the nation's commitment of hosting the 2022 FIFA world cup. The authors observe how Islamic Finance institutions are trying to combat the nation's current woes. Government and institution measures in response to COVID-19 and stimulus packages were discussed; and Islamic social finance tools, zakat, infaaq, qard hassan, and waqf were proven to be resilient to the situation. Moreover, the excessive liquidity in the Islamic banks in Qatar, Formosa Sukuk, Waqf, Zakat and policies based on objectives of Shari'ah have a great potential for reinforcing and regaining the economic stability in Qatar.

Nebil DABUR
Editor-in-chief

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Economic Growth, Productivity, and Convergence of Middle East and North Africa Countries

Mushtaq Ahmad Malik[1] and Tariq Masood[2]

ABSTRACT

The objective of this study is to investigate the variability in economic growth and productivity of the Middle East and North Africa countries for the period 1970-2014. We employed growth accounting approach to measure and decompose growth in total output into contributions from growth in factor accumulation and total factor productivity. The study also tests the hypotheses of regional convergence using the neoclassical framework. The results indicate significant variability in growth performance of oil dependent countries that can be associated with movements in oil process, at least in the short run. In most oil dependent economies, growth rates of per capita GDP are quite meagre. However, non-oil countries showed higher and consistent growth performance over the sample period. The results of growth accounting equation indicate that output growth in the region is due to the accumulation of factor inputs, while total factor productivity has a negligible or negative role. Both σ and β-convergence tests provide support for existence of convergence in per capita GDP across the countries. The study favours the adoption of large scale structural reforms to achieve sustained long run growth. At the same time, economic diversification of the individual countries to reduce dependence on single sources of income and employment would diminish the volatility of income and employment.

ملخص

تروم هذه الدراسة التحقيق في التغيرات المكانية والزمانية في النمو الاقتصادي والإنتاجية في دول الشرق الأوسط وشمال إفريقيا خلال الفترة الممتدة ما بين 1970 و 2014. وقد استخدمنا نهج حساب معدل النمو الموحد لقياس وتفكيك نمو إجمالي الناتج إلى مساهمات من التقدم التكنولوجي وتراكم عوامل الإنتاج. وتتناول الدراسة أيضا فرضية التقارب الإقليمي في الإطار الكلاسيكي الجديد. وتشير نتائجنا إلى أن الاقتصادات المعتمدة على النفط أظهرت تغيرات كبيرة في النمو قد تترافق مع تحركات على مستوى أسعار النفط. ففي معظم الاقتصادات القائمة على النفط، تعد معدلات النمو من الناتج

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المحلي الإجمالي لكل فرد والناتج المحلي الإجمالي لكل عامل هزيلة للغاية بسبب النمو السريع في عدد السكان والقوى العاملة (المواطنين والمهاجرين على حد سواء).وتشير نتائج حساب معدل النمو إلى أن نمو الناتج في المنطقة يرجع إلى تراكم مدخلات عوامل الإنتاج، بينما لا يلعب إجمالي إنتاجية عوامل الإنتاج (TFP) دورا هاما. كما يشير كل من اختباري التقارب β وσ إلى وجود تقارب في الناتج المحلي الإجمالي لكل عامل (إنتاجية العمالة) ونصيب الفرد من الناتج المحلي الإجمالي. وتؤيد الدراسة اعتماد إصلاحات هيكلية واسعة النطاق لتحقيق نمو مستدام طويل المدى. وفي الوقت نفسه، فإن التنويع الاقتصادي للبلدان على الصعيد الفردي من أجل تقليل الاعتماد على مصادر واحدة للدخل والعمالة من شأنه أن يقلل من التقلبات على مستويي الدخل والعمالة.

ABSTRAITE

L'objectif de cette étude est d'étudier les variations spatiales et temporelles de la croissance économique et de la productivité des pays du Moyen-Orient et d'Afrique du Nord sur la période entre 1970 et 2014. Nous avons utilisé l'approche standard de la comptabilité de croissance pour mesurer et décomposer la croissance de la production totale en contributions du progrès technologique et de l'accumulation de facteurs. L'étude teste également l'hypothèse d'une convergence régionale dans le cadre néo-classique. Nos résultats suggèrent que les économies dépendantes du pétrole ont montré des variations de croissance significatives qui peuvent être associées aux mouvements des prix du pétrole. Dans la plupart des économies basées sur le pétrole, les taux de croissance du PIB par habitant et du PIB par travailleur sont assez faibles en raison de la croissance rapide de la population et de la main-d'œuvre (tant les nationaux que les immigrants). Les résultats de la comptabilité de la croissance indiquent que la croissance de la production dans la région est due à l'accumulation des facteurs de production, alors que la PTF ne joue pas un rôle significatif. Tant le site β σ que les tests de convergence suggèrent qu'il existe une convergence du PIB par travailleur (productivité du travail) et du PIB par habitant. L'étude préconise l'adoption de réformes structurelles à grande échelle pour parvenir à une croissance soutenue à long terme. En même temps, la diversification économique des différents pays afin de réduire la dépendance à l'égard de sources uniques de revenus et d'emploi diminuerait la volatilité des revenus et de l'emploi.

Keywords: Economic growth, Growth accounting, Productivity, Convergence, MENA

JEL Classification: O, O4, O47

1. Introduction

Economic performance of the Middle East and North Africa (MENA)[1] region is quite dismal despite having abundant natural resources, especially oil and natural gas. Achieving stable economic growth is one of the central problems facing most of the MENA countries. Countries in the MENA region are similar on so many fronts like shared history, language, culture, geography, and political regimes. Despite being similar, there are important differences as well. Based on resource endowments, the region is often divided into two sets of countries. First, those having large reserves of oil (oil-rich countries) and are net exporters of oil. Second, countries having little or no oil reserves (non-oil countries) and are net importers of oil. Further, individual countries are substantially different in terms of population size, economic size, living standards, public-private sector balance, trade, and financial connections with other parts of the world. To any naïve observer, it may seem that the economic problems of these two groups of nations are quite different, and there is no need for the joint study of these two groups. The first group, with large rent inflows from oil exports and little population to support, is placed in an altogether different position relative to the second group, where resources to support their respective populations are quite limited. There are at least three channels through which these two groups are interconnected and need to be studied in conjunction with each other. First, there is continuous labour migration from resource-poor nations to resource-rich nations and thereby remittance flows from resource-rich to poor nations. Second, capital flows (investments, aids, and donations) from resource-rich nations to resource-poor nations. Third, continuous political events like wars, conflicts, and revolutions having regional repercussions.

The literature largely adopted the 'resource curse' theory to explain the dismal performance of many resource-based economies. The basic argument of the resource curse theory is that the economies that are heavily dependent on natural wealth are less likely to do well both on the economic and political fronts. The theory is well supported by empirical studies most notably carried out by Sachs & Warner (1995) which suggest

[1]MENA is also widely known as West Asia and North Africa (WANA) region. For our purpose it includes the following 19 countries until stated otherwise: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Iran, Iraq, Algeria, Turkey, Tunisia, Egypt, Jordan, Morocco, Syria, Lebanon, Palestine, Libya, and Yemen.

a strong negative correlation between the availability of natural resources and economic growth. Excessive dependence on natural resources is expected to cause Dutch disease, weak human capital, lack of incentive towards work, volatility in revenues, political authoritarianism, corruption, and violence and conflict. It constraints economic diversification as well. In the MENA region, all of these problems are apparent. Further, dependence on resources makes the region vulnerable to demand and price fluctuations in the world oil market, which in turn instills uncertainty and volatility in growth performance. Dependence on oil created a state-led development model for most of the countries in the region. However, re-orientation of policies towards higher efficiency and growth led by the private sector has remained elusive across the region (Yousef, 2004).

With this background, the purpose of this study is quite restricted, where we try to focus only on the long-term economic performance of the MENA countries with three specific questions:

1. Is the long-term economic performance as measured by the growth of gross domestic product (GDP) satisfactory
2. Does total factor productivity (TFP) play a significant role in sustaining growth
3. Is there any convergence of income among MENA countries?

The remainder of the paper is organized as follows. Section 2 presents a brief review of the literature. The empirical model of growth accounting approach and economic convergence is presented in Section 3. Section 4 describes the variables and data sources. Section 5 discusses long-term growth performance, decomposition of output growth, and convergence across the MENA region. Lastly, Section 6 will provide concluding remarks.

2. Literature Review

MENA region accounts for approximately 55.6 and 27.7 percent share in the global oil and gas reserves, respectively (Arab Monetary Fund, 2016). Thus, according to the classical growth theory, natural resource endowments would allow sustained growth over time across the region. Nevertheless, past literature has provided mixed results regarding the region's growth performance. When ascertaining the determinants of

economic growth, Barlow (1982) pointed out that the oil industry has directly or indirectly contributed positively to both groups of economies. However, this windfall of oil wealth was not translated into improving the living standards of the masses and achieving sustained growth rates. Accordingly, the region observed high levels of unemployment, low quality of education, and less skilled workforce. The factors like rapid population growth, war, civil war, and decolonization were also playing a significant role and affected growth performance in a negative way.

Through a study on economic growth and investment of the Arab world over the 1960-2000 sample period, Sala-i-Martin and Artadi (2003) relate poor performance of both oil and non-oil producers to investment. The decline in the investment rate during the last two decades in the region is probably a consequence, not a cause of this slowdown. The decline in the overall growth rate has led to a substantial fall in investment rates over the years. The study concluded that the low quality of investment projects is the key determinant of slow growth. The excessive reliance on public investment, the low quality of financial institutions, weak business environment, and the low quality of human capital has led to systematically unproductive investment decisions, and thus, low economic growth.

Hakura (2006) through a study to analyze the long run growth of 16 MENA countries over the period 1980-2000, also verified the weak growth performance of both oil-resource rich and poor countries. Large scale intervention of the government sector in economic activities of Gulf Corporation Council (GCC) countries, poor institutional quality and political instability has constrained the growth performance of the MENA region as a whole.

When ascertaining the determinants of economic growth, Makdisi et al. (2007) asserted that conventional factors of production played minimal role in the economic growth of MENA countries. Especially, capital accumulation and international trade are found to be less beneficial to economic growth. Moreover, external shocks in the form of volatile oil prices, modest levels of human capital formation and negligible or negative role of TFP have a substantial negative effect on growth performance.

Guetat (2006) and Abu-Qarn and Abu-Bader (2007) considered the impact of economic and non-economic factors on the economic growth of the MENA region. Growth accounting exercises showed that TFP has often been negative or detrimental to growth. Corruption and low bureaucratic quality have overwhelmingly mitigated the positive effects of human capital formation. Past empirical literature has shown that financial development is one of the most significant factors of economic growth. In this context, Hassan et al. (2001 a, b) endeavoured to explore the nexus between financial development and economic growth in low, middle and high-income countries using vector autoregressive (VAR) framework. These studies concluded a positive and significant relationship between financial development and economic growth in Organization of Islamic Conference (OIC) countries. Moreover, short term multivariate analysis suggests one-way causality running from growth to financial development. The positive and significant relationship between financial development and economic growth in the Arab world has been further verified by the studies like Hassan et al. (2007), Zirek et al. (2016), and Yu et al. (2016).

Esfahani (2009) endeavoured to investigate the role of social contracts in the MENA region and argued that the more interventionist governments with fewer resource rents at their disposal moved earlier to generate revenues through export promotion. It created a growing private sector in favor of reform and engagement in globalization. On the other hand, countries with larger resources developed more inward-oriented private sectors that were less inclined to support the export promotion and policy dynamism.

To conclude, the above cited studies have produced mixed results regarding the economic performance of the WANA region despite having abundant natural resources. Growth accounting exercises have shown that TFP has often remained negative or detrimental to GDP growth over the time. Whereas, factor accumulation is the driving force of the countries in the region.

3. Data and Methodology

3.1. Growth Accounting Decomposition

The basic idea of growth accounting is to divide output growth into input growth and factor productivity. Assuming neoclassical growth theory with two factors of production (labour and capital), Solow (1957) conducted pioneering long-term growth and productivity analysis. The study argued that a major part of the output growth was not explained by labour and capital. The unexplained part, commonly known as TFP, was attributed to improvement in the efficiency of production process.

The core arguments in the Solow (1957) model can be approximated by a simple Cobb-Douglas production function with capital and effective-labour as two critical inputs, given by

$$Y_{it} = AK_{it}^{\alpha}(HL)_{it}^{1-\alpha}, \; i \text{ is country index and } t \text{ is time index} \quad (1)$$

where Y_{it} is real GDP, K_{it} is the stock of physical capital, HL_{it} is human capital augmented labour force. A represents TFP. TFP is often considered to be a measure of efficiency over time, meaning how much a decision-making unit (country) has progressed in efficiency between two consecutive periods. α represents the share of capital in output. After simplification, the growth accounting equation can be derived from Equation (1) as:

$$(y_t - y_{t-1}) = (\mathrm{a}_t - \mathrm{a}_{t-1}) + \alpha(k_t - k_{t-1}) + (1-\alpha)(h_t - h_{t-1}) + (1-\alpha)(l_t - l_{t-1}) \quad (2)$$

Or it can be written as

$$\Delta y/y = \Delta a/a + [\alpha \times \Delta k/k] + [(1-\alpha) \times \Delta h/h] + [(1-\alpha) \times \Delta l/l] \quad (3)$$

where small case letters represent the natural log of the corresponding capital letters. Equation (3) decomposes output growth into technical progress (or improved productivity) and input growth. Technical progress indicates an increase in output as a result of improvements in methods of production (efficiency), while holding inputs as constant.

3.2. Convergence

To test the convergence hypothesis empirical literature largely relied on two different concepts. The first, known as absolute or unconditional β-convergence, occurs if a poor country tends to grow faster than rich ones in terms of per capita income, and thereby all countries converge to the common steady-state (Barro & Sala-i-Martin, 1992). Accordingly, we expect a negative relationship between per capita income and its growth rate. The basic mechanism underlying absolute β-convergence is the principle of diminishing returns to labour and reproducible capital. The second, known as σ-convergence examines the cross-sectional variation in income distribution over time. In this context, convergence occurs if the dispersion—measured, for example, by the standard deviation or coefficient of variation of output (or its growth rate) across a group of countries or regions—declines over time (Sala-i-Martin, 1996). If at time *t*, the dispersion in regional income distribution is smaller than an initial period, we can say that σ-convergence does occur. Under certain conditions, β-convergence (poor countries tending to grow faster than rich ones) tends to generate σ-convergence (reduced dispersion of per capita income or product). The formal estimation of unconditional or absolute β-convergence involves the following equation.

$$\frac{1}{T} ln \left[\frac{y_{it}}{y_{i0}}\right] = \alpha - \left[\frac{(1-e^{-\beta T})}{T}\right] lny_{i0} + \varepsilon_{i0,T} \quad (4)$$

where $\boldsymbol{y_{it}}$ is the output of *i*-th country at time *t* and $\boldsymbol{y_{i0}}$ is the output of the same country at initial year. *T* is the time span. The dependent variable of the equation represents the average growth rate over the sample period and the independent variable is the initial level of output. $\varepsilon_{i0,T}$ denotes idiosyncratic term. For a given *T*, Equation (5) can be reformulated as

$$\frac{1}{T} ln \left[\frac{y_{it}}{y_{i0}}\right] = \alpha + \lambda\, lny_{i0} + \varepsilon_{i0,T} \quad (5)$$

A negative value of $\boldsymbol{\lambda}$ indicates that the poorer regions are growing faster than richer ones that will lead to convergence. Value of β can be interpreted as the speed of convergence towards steady-state and is given as $\beta = -\ln(T\lambda + 1)/T$. Positive $\boldsymbol{\lambda}$ coefficient indicates divergence. The concept of σ-convergence asserts that dispersion, measured by the standard deviation of real per capita income across countries shrinks over

time. That is, $\sigma_t < \sigma_0$, for *t*=1, 2, 3...*T* and σ_t is the standard deviation of per capita output across the countries and is given as $\sigma^2 = \frac{1}{T}\sum_{t=1}^{T}(y_{it} - \bar{y})$, where $\bar{y}$ is the mean value of y_{it} at time *t*.

3.3. Data and Variables

This study uses annual time series data on real GDP per capita, GDP per worker, stock of physical capital, and human capital for a sample of 15 MENA countries[1] from 1970-2014. The relevant data is drawn from Penn World Tables version 9.0 (Feenstra et al., 2015). To conduct a comparative analysis of growth performance, output-side real GDP[2] at chained Purchasing Power Parity (in Million 2011 US$) is used. Real GDP per capita is obtained as a ratio of real GDP and population. For the measure of the labour force, we used data series on employment variable, which gives the total number of persons engaged in economic activity. As a measure of physical capital stock, the real physical capital series is employed, which is constructed by using the perpetual inventory method as follows:

$$K_{it} = I_{it} + (1 - \delta)K_{i,t-1}$$

where K_{it} is the capital stock available at time *t*, $K_{i,t-1}$is the capital stock at time *t*-1, δ is a constant depreciation rate, I_{it} is the investment at time *t*. Capital stock series in Penn World Table has been adjusted for differences in asset composition between countries and over time. More specifically, capital stock is the accumulation of depreciation-adjusted-investments in four types of assets: structures (including residential and non-residential); machinery (including computers, communication equipment, and other machinery); transportation equipment and other assets (including software, other intellectual property products, and cultivated assets). The human capital index is obtained based on average years of schooling for the population aged 15 and above, and an assumed rate of return for primary, secondary, and tertiary education as provided

[1]Algeria, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Iran, Iraq, Turkey, Tunisia, Egypt, Jordan, Morocco and Syria. The other remaining countries of the region are not included in the analysis due to lack of relevant data.

[2] Output-side real GDP allows comparison of productive capacity across countries and overtime. And it is estimated by using prices for final goods, exports, and imports that are constant across countries**.**

by Psacharopoulos (1994) survey of wage equations. The annual data series on average years of schooling was interpolated from the quinquennial data series provided by Barro & Lee (2013). Using these inputs, the human capital index can be constructed as follows:

$$h_{it}=e^{\emptyset(s_{it})}$$

where s_{it} represent the average number of schooling years of workers in the labour force in country i and $\emptyset(s_{it})$ is a piecewise linear function, with zero intercept and a slope of 0.13 through the 4th year of education, 0.10 for the next 4 years, and 0.07 for education beyond the 8th year

As regards the value of α [see Equation (3)], PWT data provide a variable that is an estimate of labour's share, or 1 – α. The share of capital input, α, is taken to be the one minus labour share. Empirically α is estimated to be constant, but our study is more general in that the shares are allowed to vary over time. Thornqvist (1936)[1] dealt with TFP decomposition by measuring the growth rate of a variable between two points in time, $t-1$ and t, by logarithmic differences and by using as weights the arithmetic average of the factor shares at time $t-1$ and t (Equation 6). With this approach, the TFP growth is approximated in the Hicks-neutral case by

$$(\mathrm{a}_t-\mathrm{a}_{t-1}) \cong (y_t-y_{t-1})-(\alpha_{t-1}+\alpha_t)/2(k_t-k_{t-1})+(1-[\alpha_{t-1}+\alpha_t]/2)(h_t-h_{t-1})+(1-[\alpha_{t-1}+\alpha_t]/2)(l_t-l_{t-1}) \quad (6)$$

where $(\alpha_{t-1}+\alpha_t)/2$ is the average share of capita for period $t-1$ and t. TFP, as given in Equation (6) by $(\mathrm{a}_t-\mathrm{a}_{t-1})$ is a Solow-residual—capturing those changes in output growth which are not accounted for changes in measured inputs.

4. Empirical Results

4.1. Selected Statistics of MENA Countries

Table 1 presents basic statistics of some selected macroeconomic aggregates for the MENA countries. Not all countries in the MENA region have been included in our sample, because of the data limitations.

[1] Thornqvist index is a weighted sum of the growth rates of total output, where weights are equal to the arithmetic mean of the input-shares. It is a more general index over the constant base-year weighted indexes. Thornqvist index allows weights to vary.

There are some important differences between the countries across the region. GDP levels increased rapidly across the region between 1970 to 2014 sample period. However, per capita GDP has not accelerated at the pace. This result implies that GDP has not kept pace with the population growth. In some of the oil rich countries, for example, per capita GDP in 2014 was lower relative to 1970s level. Moreover, cross-country comparison reveals that GDP per capita varied significantly from a low of $4440 for Syria to about $1,51,760 for Qatar during 2014. Another salient feature of the MENA region is the rapid population growth of 2.32 percent during the past four decades. This growth rate is highest across all the regions of the world. The expansionary policies of attracting the expatriate workforce to support various economic activities have resulted in a population growth rate of 6.30% and 7.57% in Qatar and UAE, respectively (Arab Monetary Fund, 2016). In addition, cross-country comparison reveals that during 2014, Iran, Turkey, and Egypt had a population of over 75 million each, while Bahrain, Kuwait, and Qatar had a population of less than 4 million. There are certainly other important differences between the countries which will be highlighted in the sections to follow.

Table 1: Basic Macroeconomic Aggregates for Selected MENA Countries

	Real GDP (Billion)		**Population (Million)**		**Real GDP per capita (Thousands)**	
Countries	**1970**	**2014**	**1970**	**2014**	**1970**	**2014**
Oil dependent countries						
Bahrain	4.32	53.29	0.22	1.36	19.55	39.13
Kuwait	102.03	260.11	0.81	3.75	126.30	69.31
Oman	4.61	161.08	0.75	4.24	6.15	38.03
Qatar	11.20	329.64	0.12	2.17	93.95	151.76
Saudi Arabia	201.24	1487.96	6.10	30.89	33.01	48.18
UAE	67.19	636.90	0.28	9.09	244.19	70.10
Iran	230.38	1218.37	29.28	78.14	7.87	15.59
Iraq	32.04	430.02	10.26	35.27	3.12	12.19
Algeria	93.34	509.31	14.96	38.93	6.24	13.08
Non-oil dependent countries						
Turkey	233.09	1525.26	35.61	77.52	6.55	19.67
Tunisia	14.21	118.66	5.17	11.13	2.75	10.66
Egypt	38.64	968.57	35.56	89.58	1.09	10.81
Jordan	5.31	88.01	1.74	7.42	3.05	11.87
Morocco	34.21	249.68	16.39	33.92	2.09	7.36
Syria	22.06	83.36	6.60	18.77	3.34	4.44
MENA	1093.87	8120.23	163.84	442.19	6.68	18.36
Oil	746.35	5086.69	62.77	203.85	11.89	24.95
Non-oil	347.51	3033.54	101.07	238.34	3.44	12.73

Source: Authors own calculations using Penn World Tables (9.0).

Note: Figures for MENA, Oil and Non-oil is constructed by aggregating data across individual countries of the region, oil dependent countries, and non-oil dependent countries, respectively.

4.2. Evolution of Growth

Here we restrict our focus to trace the economic growth of the MENA region over a long time. Table 2 displays average growth rates of GDP between 1970 to 2014 for the MENA region, along with two subgroups of oil and non-oil countries. There is a great diversity of growth rates across the region. GDP increased at a rapid rate over the sample period, as shown in column 6 of Table 2. Three of the oil rich countries, namely Oman, UAE, and Iraq achieved double-digit growth rates during 1970-80. Although Kuwait and Iran have substantial oil resources, they registered negative growth rates during the same period. Furthermore, non-oil exporting countries, except Syria, performed relatively well during the 1970s mainly due to the remittances, foreign aid, foreign investment, and trade flows from oil exporting countries (Al-rawashdeh & Al-nawafleh, 2013)[7]. When oil prices plummeted during 1980s, there was a sharp decline in the GDP growth rates across the region as a whole. For example, oil rich countries registered negative growth in GDP, while non-oil countries registered positive and higher growth in GDP during 1980s. In addition, there were significant differences among the oil rich and non-oil countries (see column 3 of Table 2). The following decade of the 1990s witnessed a moderate recovery in growth performance because of the rise in oil prices. Oil is perceived to be used for fueling growth in the MENA region. Our analysis has partially confirmed this empirical observation—look at the last two decades of high growth following a rise in oil prices.

[7] Ilahi & Shendy (2008) analyzed 35 years panel data and estimated that the growth rates of real GDP, private consumption, private investment in the non-oil MENA economies are significantly explained by financial and remittances outflows from the GCC countries. The growth elasticity of financial flows is about 0.17 to 0.21, while the growth elasticity of remittances is about 0.07 to 0.09.

Table 2: Average GDP Growth Rates

Country	1971-80	1981-90	1991-2000	2001-2014	1970-2014	volatility
Oil-dependent countries						
Bahrain	8.15	-1.56	7.80	10.53	5.79	2.23
Kuwait	-1.94	-4.07	9.63	10.84	2.65	5.22
Oman	14.84	1.29	5.84	11.93	8.05	1.42
Qatar	5.22	-2.59	10.26	20.69	7.69	1.81
Saudi Arabia	8.02	-3.55	1.95	11.81	3.48	2.41
UAE	15.41	-2.94	4.37	7.00	4.56	2.28
Iran	-5.16	2.16	9.71	5.96	5.36	2.71
Iraq	11.08	1.48	11.86	15.36	4.05	2.43
Algeria	9.27	-1.82	2.02	5.87	2.90	1.63
Non-oil dependent countries						
Turkey	4.28	4.96	3.68	6.77	3.91	1.24
Tunisia	7.20	4.69	6.25	3.55	5.05	0.82
Egypt	4.86	5.51	10.93	9.44	8.32	0.81
Jordan	7.43	4.22	4.36	14.18	6.19	1.35
Morocco	5.71	7.52	2.26	6.27	4.52	1.11
Syria	-2.35	-2.52	6.32	7.98	3.79	3.74
MENA	4.97	0.80	5.23	8.53	4.39	1.20
Oil	5.27	-1.90	5.21	9.17	4.11	1.61
Non-Oil	4.30	5.09	5.23	7.53	4.90	0.86

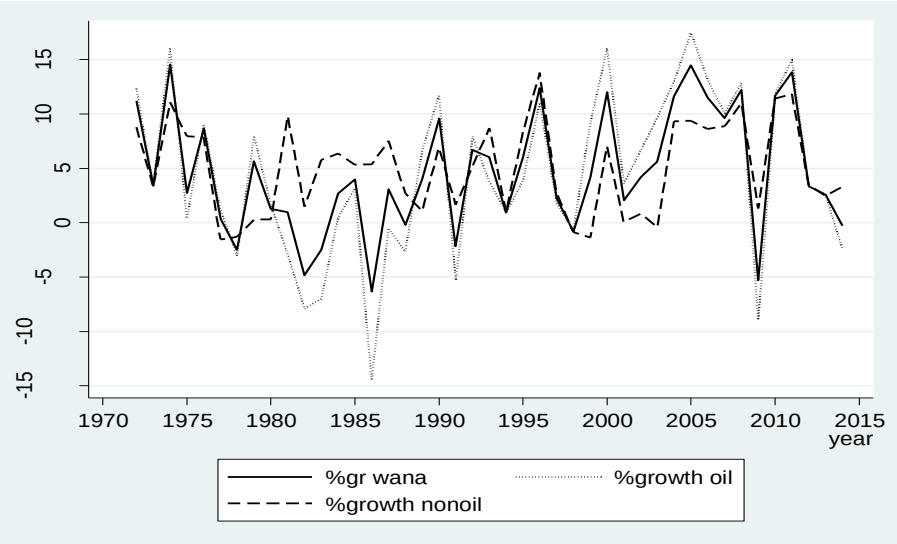
Source: Authors own calculations using Penn World Tables (9.0).

Notes: Growth rates are calculated using the OLS regression $lnY_t = \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 + \alpha_4 D_4 + \beta_1 D_1 t + \beta_2 D_2 t + \beta_3 D_3 t + \beta_4 D_4 t + u_t.$, where D_i, i =1,2,3,4 is a dummy for each decade.

Figure 1 shows the pattern of GDP growth rates for the MENA region as a whole, along with the two sub-groups of oil and non-oil countries during the 1970-2014 sample period. One salient feature of this growth performance is its high volatility[8].

[8] The ratio of standard deviation and absolute mean of growth rates is the commonly used measure of growth rate volatility.

Figure 1: Annual growth rate of GDP (1970-2014)



Source: Authors own calculations.

As shown in Figure 1 and the last column of Table 2, volatility is larger for oil rich countries (1.61) than the region's (1.20) and non-oil countries (0.86) levels. This volatility in growth rates across the MENA region, in general, and oil-rich countries, in particular, is ascribed to fluctuations in global oil market. More specifically, it is argued that the economic growth across the MENA countries depends on energy prices. During the 1980s, when energy prices declined, the graph drifts below zero. For non-oil countries, however, it remained fairly stable. Moreover, volatility in growth rates is attributable to several other factors that are peculiar to the region. The most prominent include, among others, lack of diversification which in turn increases vulnerability to external shocks (Malik and Masood, 2020); perennial regional conflict, political instability (Makdisi et al., 2007); and low-quality investment projects, low human capital, underdeveloped financial institutions, and a large share of the government in economic activities (Sala-i-Martin & Artadi, 2003).

Table 3 and Figure 2 shows how per capita GDP growth is evolving in the MENA region. Several stylized features emerge. The annual growth rates are highly volatile for the overall period. The volatility of oil rich

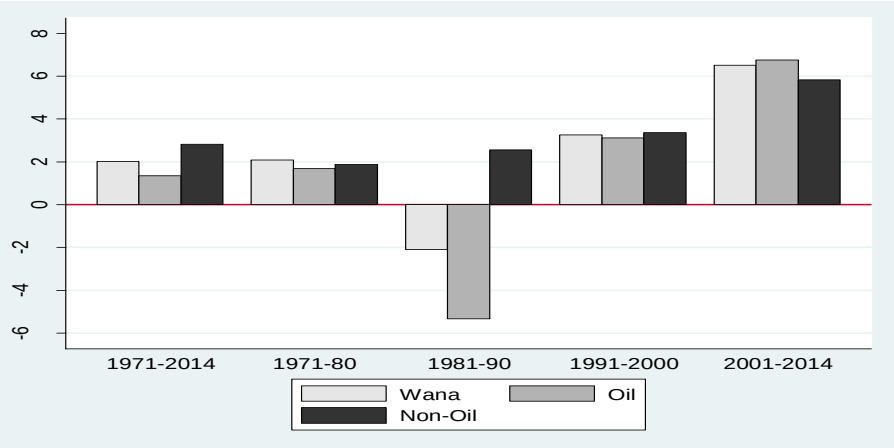
countries (3.88) is higher than the region's (2.36) and non-oil countries (1.40) levels. Using a sample of 92 countries, Ramey and Ramey (1995) found negative and significant relationship between volatility and output growth. Large volatility, coupled with low growth rate, which is very clear in the case of oil-exporting countries, serves as an indication of the phenomena of "natural resource curse." Hnatkovska and Loayza (2003) assert that this negative association between volatility and growth rate is not only statistically but also economically significant. They argued that negative relationship becomes stronger for countries with underdeveloped institutions, low financial development, and countries that are unable to conduct countercyclical fiscal policies. For two consecutive decades, some oil-exporting countries (Kuwait, Saudi Arabia, Qatar, and Iran) registered negative growth rates and very high volatility. For over four consecutive decades, UAE had a negative average growth rate with volatility of 6.10. After controlling for simultaneous and reverse causality bias in the volatility and growth relationship, Hnatkovska and Loayza (2004) estimated that one percent increase in volatility decreases growth by 1.3 percentage points, which represent a significant drag on output growth. Furthermore, from 1970-2014 the average growth rate of resources poor countries such as Egypt, Tunisia, Morocco, Jordan, and Turkey, remained relatively superior and even surpassed the major oil exporters where their average growth did not exceed 2 percent (see Figure 2). Table 3 shows that the growth rate of oil producers was negative during the early 1980s—period of a steep decline in oil prices—while that of the non-oil producers was positive, but the region as a whole registered negative growth rate. It shows that, despite substantial heterogeneity between individual countries, the region as a whole is showing a common trend of growth performance which is very disappointing.

Table 3: Average Growth of GDP per capita

Country	1971-80	1981-90	1991-2000	2001-2014	1971-2014	volatility
Oil-dependent countries						
Bahrain	2.22	-4.62	4.68	4.24	1.58	5.32
Kuwait	-7.62	-8.00	10.06	5.19	-0.08	25.86
Oman	9.40	-2.99	4.04	7.04	4.37	2.58
Qatar	-1.52	-9.42	7.85	7.76	1.31	6.86
Saudi Arabia	2.33	-8.13	-0.65	8.94	-0.28	7.69
UAE	-0.54	-8.24	-0.84	-2.51	-2.79	6.10
Iran	-8.03	-1.64	8.01	4.71	2.95	5.20
Iraq	7.59	-0.92	8.50	12.16	1.18	3.62
Algeria	6.21	-4.64	0.23	4.19	0.67	3.49
Non-oil dependent countries						
Turkey	1.88	2.84	2.07	5.27	2.10	2.06
Tunisia	4.77	2.06	4.59	2.52	3.16	1.19
Egypt	2.58	2.73	8.88	7.37	6.01	1.12
Jordan	4.36	0.33	1.04	10.25	2.62	2.61
Morocco	3.36	5.23	0.79	5.07	2.78	1.68
Syria	-5.60	-5.66	3.46	6.51	0.98	8.87
MENA	2.09	-2.09	3.26	6.51	2.01	2.36
Oil	1.69	-5.34	3.12	6.76	1.35	3.88
Non-Oil	1.88	2.56	3.36	5.83	2.82	1.40

Source: Authors own calculations using Penn World Tables (9.0).

Figure 1: Annual Growth Rate of Per Capita GDP



Source: Authors own calculation

4.3. Growth Accounting

In this section, growth accounting exercise is conducted to shed some light on the contribution of different factors of production to economic growth. Understanding the sources of growth and their relative contribution is, therefore, critical for designing policies for sustaining growth. Our focus here is on the structural determinants of long-run growth as predicted by standard augmented Solow (1957) model.

Table 4: Growth Accounting for Selected MENA Countries

Country	Output growth	Contribution from			
		Labour	Capital	Human capital	TFP
Oildependent countries					
Bahrain	4.02	1.89	4.10	0.43	-2.42
Kuwait	0.13	1.14	3.28	0.21	-4.62
Qatar	6.29	2.12	5.14	0.38	-1.46
Saudi Arabia	3.24	1.54	2.49	0.38	-1.19
Iran	2.04	0.98	3.26	0.53	-2.78
Iraq	5.41	0.60	2.60	0.27	1.69
Non-oil dependent countries					
Turkey	4.06	0.86	2.53	0.70	-0.04
Tunisia	4.54	1.20	2.02	0.91	0.39
Egypt	5.35	1.01	3.99	0.67	-0.34
Jordan	4.42	1.94	3.19	0.80	-1.53
Morocco	3.92	1.52	2.32	0.62	-0.58
MENA	3.68	1.04	2.93	0.54	-0.83
Oil	3.19	0.99	3.08	0.37	-1.29
Non-oil	4.60	1.21	2.70	0.68	-0.14
Comparators					
India	5.37	1.50	2.13	0.78	0.96
China	6.57	1.22	3.42	0.79	1.14
Brazil	3.76	1.35	2.08	0.72	-0.39
Singapore	6.82	1.59	4.32	0.75	0.14
Japan	2.48	0.27	2.51	0.35	-0.65

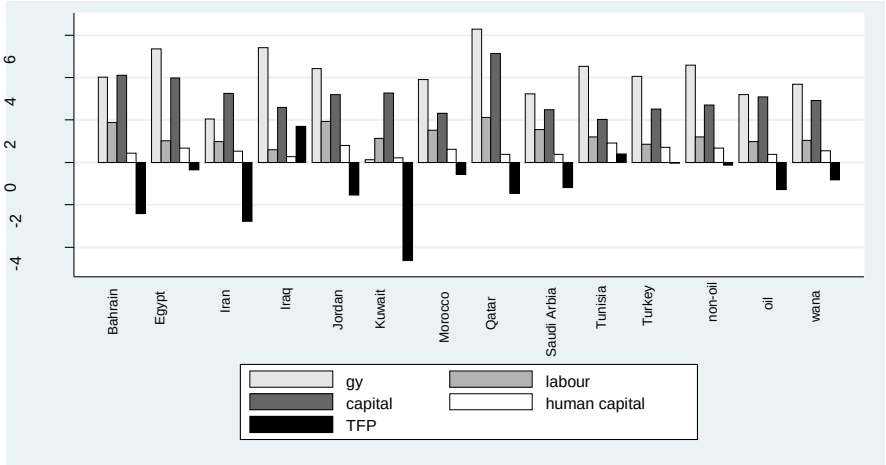
Source: Authors own calculations using Penn World Tables (9.0).

Table 4 and Figure 3 reports growth accounting estimates for selected MENA countries[9] for the 1970-2014 period. These results are derived from Equation (6) in Section 3.3. The growth rate of real GDP per capita

[9] Necessary data for growth accounting on remaining countries under consideration namely Oman, UAE, Algeria and Syria was not available and has been left out of analysis in growth accounting decomposition.

is decomposed into contributions from the growth rates of labour, human capital, physical capital, and TFP. Our first observation is that labour and capital are the dominant factors of output growth followed by human capital.

Figure 2: GDP Growth Rate Decomposition (1970-2014)



Source: Authors own calculation

Table 4 shows that the contribution of human capital to the GDP growth is meagre across the countries as a whole over the 1970-2014 sample period. However, relative to oil rich countries, non-oil producing countries have observed higher growth in human capital which augmented aggregate GDP growth. TFP does not seem to play any significant role, rather it is detrimental to the growth performance of MENA countries. All countries have observed negative TFP growth rates, with the exception of Iraq and Tunisia. In the case of Iraq, TFP contributes about 31 percent in per capita GDP growth, while in the case Tunisia, TFP contributes about 8.5 percent, respectively. Over time, the MENA region as a whole registered negative TFP growth relative to the benchmark countries (see Table 4, comparators). It indicates that the region has failed to improve the efficiency of the production processes over time. The negative productivity is the major factor in the sluggish growth performance of the MENA countries. These findings are in line with Makdisi et al. (2007) and Abu-Qarn and Abu-Bader (2007).

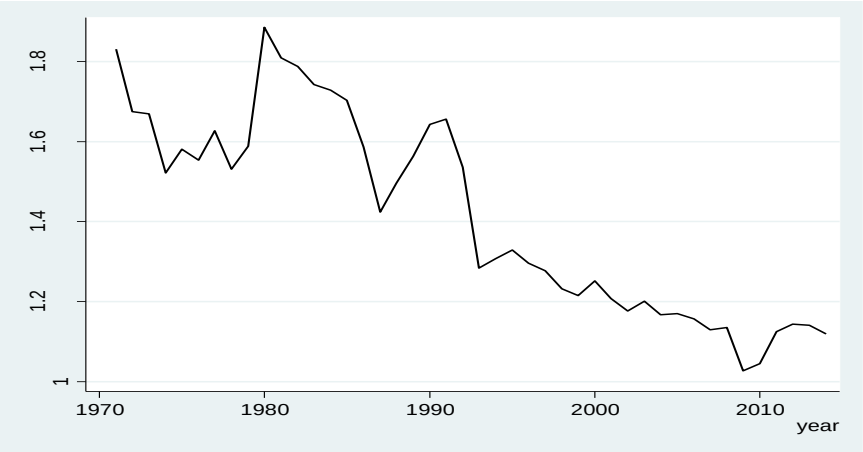
An important point to highlight here, however, is that TFP is a residual measure which embodies other factors affecting growth not included in labour, physical capital and human capital. Makdisi et al. (2007) regressed TFP growth on a series of relevant variables to assess their relative contribution. The main repressors' were the quality of institutions, inflation rate, initial income, initial enrolment rate in primary school, and index of natural resource abundance. At low values of capital share, the results indicated that institutions and stock of human capital have positive effects on TFP growth. Inflation rate and natural resource abundance had a negative influence on productivity. However, initial income with negative sign points catching–up effect on productivity. With a higher value of the capital share, only initial income and human capital remained statistically significant. All these empirical findings emphasize the adoption of policies that will lead to an improvement in productivity growth.[10]

4.4. Convergence

Following section 3, we analyze two types of convergence, namely σ-convergence and absolute β-convergence. Figure 4 shows the dispersion—measured by the coefficient of variation—of per capita GDP across MENA countries between 1970 to 2014 sample period. The figure portrays a declining trend in cross-country dispersion of per capita GDP. It clearly shows that the income gap between countries of the MENA region declines and the hypothesis of σ-convergence is accepted. In addition, for the overall period, it is found that the coefficient of variability (of per capita income) series on time is found to be negative and statistical significant at 1% significance level (Table 5).

[10] See Bisat, El-Erian, & Helbling (1997) has highlighted various policy measures for achieving high and sustained growth in Arab countries.

Figure 4: Dispersion of Income across MENA Countries, 1970-2014



Source: Authors own calculation

Table 5: Estimation of the **σ**-convergence

	Coefficients	***t-Statistic***	***P-value***
Intercept	36.15	13.31*	0.00
time	-0.018	-12.79*	0.00
R-Square			0.795

Source: Authors own calculation.
* indicates 1% level of significance

Table 6 and Figure 5 displays the average growth rate of per capita GDP from 1970-2014 for each country against the log of per capita GDP in 1970. The cross-country variation in growth rates is very clear in Figure 5. A visual inspection of the table reveals that the hypothesis of absolute β-convergence holds in our study. As the countries that were rich in 1970, for example, UAE, Qatar, and Kuwait, registered slow (even negative) growth rates over the subsequent time period, while initially poor countries, for example, Egypt, Morocco, and Jordan registered rapid growth. Table 6 reports the estimation results of absolute β-convergence. The hypothesis of absolute β-convergence is accepted for our dataset because the coefficient on initial income level is negative and significant at 1% level of significance.

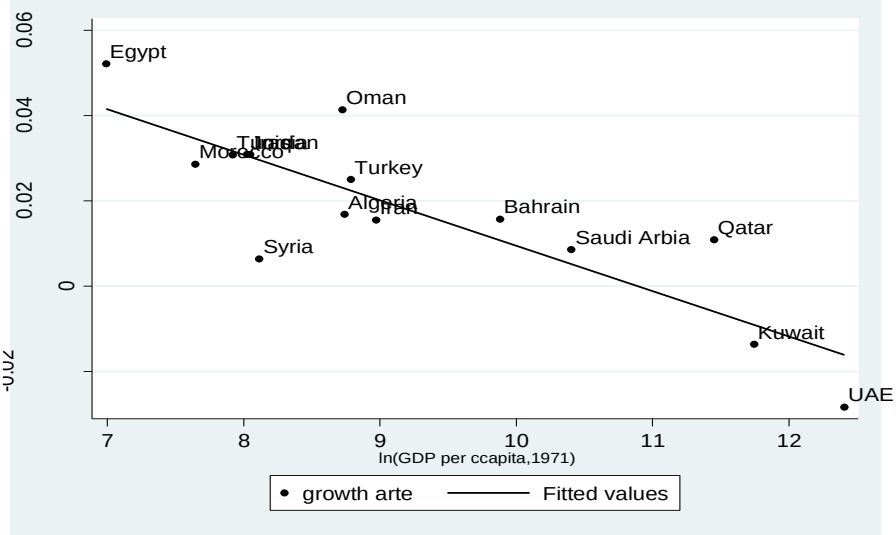
Table 6: Estimation of β-convergence (Dependent variable is Growth rate)

	Coefficients	t-Statistic	P-value
Intercept	0.116121	6.893712*	0.00
ln(GDP pc,1970)	-0.01066	-5.90211*	0.00
R-Square			0.728

Source: Authors own calculation.
* indicates 1% level of significance

Furthermore, Figure 5 shows that the relationship between growth rate and initial level of per capita GDP is negative that reinforces the results of growth regression summarized in Table 6.

Figure 3: Convergence of Per Capita GDP across Countries



Source: Authors own calculation

The results presented in Table 5 and Table 6 show that σ-convergence and absolute β-convergence holds for our sample countries. The goodness-of-fit measures reported un Table 5 and 6 are satisfactory with R-square of 79 and 72 percent, respectively. These findings indicate that initially poorer countries grew more rapidly than rich ones, and dispersion in per capita income across the MENA region decreased over the 1970-2014 sample period.

5. Conclusion

The present study explored the long run growth trend of the MENA countries from 1970 to 2014. Specifically, the study focused on three issue—variability in economic growth; role of total factor productivity; and convergence of income across the MENA countries over time. The findings indicate that oil dependent economies have registered significant variability in growth which can be linked with the fluctuations of oil prices. Due to the rapid growth of population and labour force (both nationals and immigrants), growth rates of per capita GDP are quite meagre in most of the oil-based economies. The output growth in the region is due to the accumulation of factor inputs, while TFP does not play a significant role in output growth, with the exception of Iraq and Tunisia. Our findings point out that labour and capital are the dominant factors of output growth followed by human capital across the MENA countries. Both σ and absolute β- convergence tests provide overwhelming support for convergence in per capita GDP across the countries. The statistical results of the study have some policy implications. In light of the above findings, there is an urgent need for policymakers and governments of the respective countries in the region to undertake structural reforms (meaningful human capital development, research and development, financial sector development, economic openness, and strong private sector) aiming at sustaining long run growth rate. Particularly, TFP growth needs to be improved by raising the efficiency of input factors and undertaking technological improvements. Economic diversification of respective countries to reduce dependence on single sources of income and employment would help to mitigate the undesirable effects of external shocks.

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The Impact of Crude Oil Import Prices on Household Natural Gas Prices: The Case of Turkey

Halim Tatlı[1] and Doğan Barak[2]

ABSTRACT

This study examines the impact of crude oil import prices on household natural gas prices in Turkey. The household sector natural gas prices are chosen as a dependent variable while crude oil import price and real exchange rate are chosen as independent variables. The data for the period 1990-2016 for these variables are analyzed by the ARDL, causality test, variance decomposition and impulse-response functions. As a result of the ARDL, it was concluded that both short-run and long-run crude oil import prices affect natural gas prices positively while the real exchange rate affects it negatively. The results obtained from the impulse-response functions confirm the results of the ARDL model. According to the causality test result, there is not any causality between crude oil import prices and household natural gas prices. However, it has been concluded that there is unidirectional causality from the real exchange rate to the natural gas prices.

ملخص

تبحث هذه الدراسة في تأثير أسعار استيراد النفط الخام على أسعار الغاز الطبيعي للاستخدام المنزلي في تركيا. ويتم اختيار أسعار الغاز الطبيعي للقطاع المنزلي كمتغير تابع بينما يتم اختيار سعر استيراد النفط الخام وسعر الصرف الحقيقي كمتغيرات مستقلة. ويتم تحليل بيانات الفترة 1990-2016 لهذه المتغيرات بواسطة الانحدار الذاتي للابطاء الموزع ((ARDL، واختبار السببية، والتفكك التبايني ودالات الاستجابة للقوى الدافعة. وكنتيجة للانحدار الذاتي للابطاء الموزع، تم التوصل إلى أن أسعار استيراد النفط الخام على المدى القصير والطويل تؤثر بشكل إيجابي على أسعار الغاز الطبيعي بينما يؤثر سعر الصرف الحقيقي عليها بشكل سلبي. وتؤكد النتائج التي تم الحصول عليها من دالات الاستجابة للقوى الدافعة نتائج نموذج الانحدار الذاتي للابطاء الموزع.وبناء على نتيجة اختبار السببية، لا توجد علاقة سببية بين أسعار استيراد النفط الخام وأسعار الغاز الطبيعي المنزلي. ومع ذلك، فقد تم التوصل إلى أن هناك علاقة سببية أحادية الاتجاه من سعر الصرف الحقيقي إلى أسعار الغاز الطبيعي.

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ABSTRAITE

Cette étude examine l'impact des prix des importations de pétrole brut sur les prix du gaz naturel pour les ménages en Turquie. Le prix du gaz naturel dans le secteur des ménages est choisi comme variable dépendante, tandis que le prix des importations de pétrole brut et le taux de change réel sont choisis comme variables indépendantes. Les données de ces variables pour la période 1990-2016 sont analysées par l'ARDL, le test de causalité, la décomposition de la variance et les fonctions de réponse impulsionnelle. À la suite de l'ARDL, il a été conclu que les prix des importations de pétrole brut à court et à long terme ont une incidence positive sur les prix du gaz naturel, tandis que le taux de change réel a une incidence négative. Les résultats obtenus à partir des fonctions de réponse impulsionnelle confirment les résultats du modèle ARDL. Selon le résultat du test de causalité, il n'y a pas de lien de causalité entre les prix des importations de pétrole brut et les prix du gaz naturel pour les ménages. Cependant, il a été conclu qu'il existe une causalité unidirectionnelle entre le taux de change réel et les prix du gaz naturel.

Keywords: Household natural gas prices, crude oil import prices, natural gas prices in Turkey, real exchange rate, Autoregressive Distributed Lag (ARDL)

JEL Classification*:* C22, Q21

1. Introduction

The growing demand for energy causes a rapid increase in energy prices in both developed and developing countries. An increase in energy demand and fluctuations in energy prices may harm many economic indicators in energy importing countries. An increase in energy prices not only affects the production of goods and services negatively but also causes an increase in inflation by increasing the cost of production in a given economy. In an oil-exporting country, an increase in the price of oil have enhanced the exchange rate, while in an oil-importing country, a fall in oil price can decrease the value of the exchange rate (Reboredo et al., 2014:132).

International crude oil prices, which have an impact on the prices of several energy products, could also affect natural gas (here after gas) prices. Since oil and gas are substitute goods, gas prices are dependent on international crude oil prices in the world. But, in recent years, gas

markets have been developed at different levels in the unregulated zones (Ji et al., 2014: 96). Therefore the gas prices are mostly determined locally, while the crude oil prices are determined on the world market. (Villar and Joutz, 2006: 2). Increases in oil prices can affect the gas market from different aspects. An increase in crude oil prices will encourage consumers to substitute gas for petroleum products. Increases in crude oil prices arising from the increase in crude oil demand may increase the production of gas, which is a by-product of petroleum. Hence, this will be in the tendency to reduce gas prices. The increase in crude oil prices due to the increase in crude oil demand may cause an increase in gas prices because it will increase gas production and development costs (Villar and Joutz, 2006: 4). Electricity producers and large-scale fuel consumers, such as iron and steel plants and paper mills can change the type of fuel depending on the cost of each fuel and the elasticity of substitution between fuels. When the cost of other fuels falls, a decrease in gas prices might reduce gas demand. When the cost of substitute fuels increases more than the cost of gas, substituting gas for these fuels can increase gas demand and prices consequently (Energy Information Administration-EIA, 2017). EIA (2017) stated that in 2016 most of the electricity was generated from gas for the first time and it was a breaking of a record. So that the largest source for the overall electricity generation has become gas.

According to Giziene and Zalgiryte (2015), gas price is a major political and economic problem. Therefore, gas prices do not only create additional costs for households and industries but also affect the corporate global competitive power. There are internal and external factors that are affecting gas prices. Internal factors include the costs of the depreciation of the gas infrastructure and the costs of the facilities including gas infrastructure development costs, as well as the purchase, transportation, warehousing, and production costs. External indicators include energy price, fuel, distillation, coal, and local resources (Giziene and Zalgiryte, 2015: 115). There are also other factors that affect gas prices. Brown and Yücel (2008) emphasize that variables such as weather, stocks, hurricanes, and other seasonal factors have a significant effect on the dynamic adjustment of prices in the short-run. In his study of how air shocks affect the US gas prices, Mu (2007) concludes that the weather has a significant impact on gas prices.

Since gas is more environment-friendly than other fossil fuels, it is preferred in the household sector in many countries. Turkey is one of the countries that has adopted such a preference. As of 2017, households living in 76 of the 81 Turkish cities are using gas. Moreover, the government plans to complete the infrastructure investments at the end of 2018 so that gas will be available for the households living in all 81 cities. The total amount of the investment (excluding operating expenses and VAT) made by the companies, which have a gas distribution license, has increased by 15.24% as of the end of 2017 when compared to the previous year and reached 15.119 million TRY (Energy Market Regulatory Authority-EMRA, 2018). In addition, the gas consumption of the consumers, who are the subscribers of these companies increased by 15.19% to 13,081.67 million cubic centimeters (cm^3) when compared to the previous year. These data demonstrate that gas consumption in the Turkish household sector has increased and will continue to increase in the following years. Turkey imports a significant portion of its gas. In 2017, 55.249,95 million cm3 of gas were imported and gas imports increased by 19.20% when compared to 2016 (EMRA, 2018). Since domestic gas production is at the negligible level in Turkey (0.4 bcm - Billion Cubic Meters), almost all of the gas supplied to the market (48.2 bcm) is imported (International Energy Agency -IEA, 2016). As being Turkey's main source of fuel, gas constitutes 30.2% of Turkey's total primary energy supply. Also in 2017, 37% of the electricity generated in Turkey was produced from gas (Republic of Turkey Ministry of Energy and Natural Resources, 2018). Since the households are the significant consumers of gas and electricity in Turkey, an increase in the gas prices may affect them directly through gas consumption and indirectly by causing an increase in the electricity production costs. Because the significant portion of the gas used in Turkey is imported, foreign exchange rates, strategic trade agreements between countries, and international political events may affect gas prices. Turkey's closeness to the rich gas reserves such as the Middle East and Central Asia and gas transport investments in Turkey made by these regions have the potential to diminish the increase in gas prices. Turkey has made some reforms in the gas market in 2001. These reforms include the liberalization of imports and arrangements made for the domestic gas market. Within this framework, in 2016, some amendments were made in the Natural Gas Market Law, which was enacted in 2001.

In the world and Turkey, the factors affecting the gas prices, of which consumption has been ever-increasing, become crucial. Price is an important factor affecting energy demand. Since the middle class constitutes a significant portion of the Turkish population (Yıldız and Bas, 2017), the increase in gas prices can create negative impacts on the life of this class. Therefore, policymakers need to determine the factors influencing gas prices in making effective decisions. This study aims to determine the relationship between international crude oil prices and gas prices consumed in the Turkish housing sector using different econometric methods. In the first part following the introduction section of the study, the literature summary is given in the second part, while in the third part empirical analysis is carried out and the study is completed with the results and suggestions.

2. Literature Review

Nowadays, gas is used in several areas, such as the production of goods and services in the industrial sector and final consumption in the household sector. The changes in gas prices may produce impacts in several areas. When the literature is examined, it is seen that energy economists have recently been working on gas prices.

When the studies on the determinants of gas prices are examined, it is seen that many studies focus on the cointegration relationship between gas and crude oil markets (Brigida, 2014; Ramberg and Parsons, 2012; Panagiotidis and Rutledge, 2007; Bachmeier and Griffin, 2006). However, in recent years, there have also been studies showing that there is a gas market separated from the oil market (Batten et al., 2017, Caporin and Fontini, 2017, Nick and Thoenes, 2014). Therefore, Geng et al. (2017) emphasized that the dynamic relationship between gas and crude oil prices is very complicated due to fluctuations in their prices and that there are different linear and nonlinear causalities between oil and gas markets. Jadidzadeh and Serletis (2017) stated that a response of gas prices to an oil price shock depends on the source of a shock. Besides, Nick and Thoenes (2014) suggested that gas prices are mainly affected by both coal and crude oil prices. Bekheta et al. (2016) stated there are significant linear effects between gas prices and their determinants. Misund and Oglend (2016) investigate the dynamic relationship between daily shocks in gas demand and supply and gas spot price volatility in the United Kingdom. They found evidence that the daily deviations in total

gas demand have significant influences on the volatility. Besides, they concluded that the decline in the volatility has been associated with a diminishing demand and a decline in the crude oil volatility.

Considering the literature in the world, it is seen that different samples, methods, and periods are discussed in studies on the relationship between oil and gas prices. In this context, studies in the literature on the issue are arranged in term, sample, method, and result and are presented in Table 1.

Table 1: Summary Literature Findings

Author(s)	Year	Country	Method	Result
Hartley and Medlock III (2014)	1995:1-2011:12	United States	ECM and Johansen cointegration	The exchange rate was decided to be an important determinant of the relative gas prices with respect to crude oil.
Ji et al. (2014)	1997:1-2011:8	North America, Europe and Asia	VAR	It was determined that the volatility in oil prices has a negative impact on regional gas prices.
Hulshof et al. (2016)	2011-2014	Netherlands	Linear regression model	It was determined that the oil price has little effect on the gas price and the coal price has no effect on the gas price.
Atil et al. (2014)	1997:1-2012:9	United States	NARDL	It has been found that oil prices affect gasoline prices and gas prices in an asymmetric and non-linear manner, and it is found that the price transmission mechanism is not the same.
Brigida (2014)	1997:6-2012:9	United States	Markov-switching cointegrating, ECM	It was determined that there is a significant relationship between oil prices and gas prices.
Ramberg and Parsons (2012)	1997:6-2010:12	United States	VECM and conditional ECM	It was determined that there was a cointegration relationship between gas and oil prices and this relationship changes over time. Also, it has been determined that oil prices positively affect gas prices in both the short-term and long-term.

Table 1: Summary Literature Findings(cond)

Author(s)	**Year**	**Country**	Method	**Result**
Bachmeier and Griffin (2006)	1990:1-2008:8	United States	ECM	They found a very weak relationship between crude oil, coal, and gas markets.
Panagiotidis and Rutledge (2007)	1996-2003	United Kingdom	Johansen (1995) and Breitung (2002) cointegration test, ECM	They concluded that there is a long-term balance between gas and oil prices.
Jadidzadeh and Serletis (2017)	1976:1-2012:12	United States	VAR	Crude oil prices were found to be an important factor of gas prices.
Lin and Li (2015)	2008:1-2012:6	United States, Europe and Japan	VEC-MGARCH	European and Japanese gas prices are co-integrated with Brent oil prices, but the US gas price has been separated from the oil.
Nick and Thoenes (2014)	2008:1-2012:6	Germany	structural VAR	Gas prices are affected in the short-run by the shortcomings of temperature, storage, and supply, while in the long-run they are tightly coupled with both crude oil and coal prices.
Batten et al. (2017)	1994:1-2014:12	Russia	Causality test	It was specified that there is no evidence for a consistent relationship between oil and gas markets.
Caporin and Fontini (2017)	1997:1-2013:12	United States	VECM	They stated that it is certainly not possible to assess whether a new long-term relationship between oil and gas has been established.
Mohammadi (2009)	1960-2007	United States		There is an insignificant relationship between electricity and crude oil and gas prices in the long-run.
Méndez-Carbajo (2011)	1990-2008	Dominica	VECM	A bi-directional causality finding between gas prices and real exchange rate has been found.
Geng et al. (2017)	1997:1-2016:1	North America and Europe	EEMD, linear and nonlinear and GCT	It was determined that there is bidirectional nonlinear causality between oil and gas markets.

ECM: Error Correction Model; VAR: Vector Autoregressive Model; NARDL: Nonlinear Autoregressive Distributed Lag; VECM: Vector Error Correction Model; EEMD: Ensemble Empirical Model Decomposition Method; GC Test: Granger causality tests

It is shown in Table 1 that different results have been obtained in empirical studies conducted on different countries with different methods

on the subject. For example, in the studies carried out by Ji et al (2014), Hulshof et al. (2016), Atil et al. (2014), Brigida (2014), Ramberg and Parsons (2012), Jadidzadeh and Serletis (2017) and Mohammadi (2009), it has been found that there is a significant relationship between gas prices and oil prices. In some studies, it has been also found that there is a causal relationship between gas and oil prices (Méndez-Carbajo, 2011; Geng et al. 2017).

In Turkey, there is a very limited number of studies on the relationship between gas and oil prices. In their study, which examined the causal relationship between oil and gas prices in Turkey for the period 2000-2011 Akgül and Burucu (2013) concluded that there is a bidirectional causality relationship between oil prices and gas prices. The relationship between gas and oil price indices and Istanbul Stock Exchange industrial sector indices in Turkey for the period October 2005- September 2015 was tested in Eyüboğlu and Eyüboğlu (2016) via Johansen cointegration method, VECM, and GC test. It has been determined that there is a long-run relationship between existing indices and both gas and oil prices. On the other hand, there is not any study on the determinants of the gas prices in the household sector in Turkey.

3. Data and Methodology

3.1. Data

In this study, the impact of crude oil import prices and the real exchange rate on the household gas prices in Turkey was examined by using annual data for the period 1990-2016. The explanations for the variables and the sources from which the variables are obtained are given in Table 2. The relationship established between the dependent variable and the independent variables in the study was established in a logarithmic form and is presented in Equation 1.

$$\ln GP_t = \alpha_0 + \alpha_1 \ln OP_t + \alpha_2 \ln RER_t + u_t \quad (1)$$

Here, ln*GP*, ln*OP*, and ln*RER* are the household sector gas price, crude oil import price, and real exchange rate respectively. ln*GP* was converted to real form by proportioning to the US GDP deflator. The real exchange rate was calculated by proportioning to the nominal exchange rate purchasing power parity (PPP).

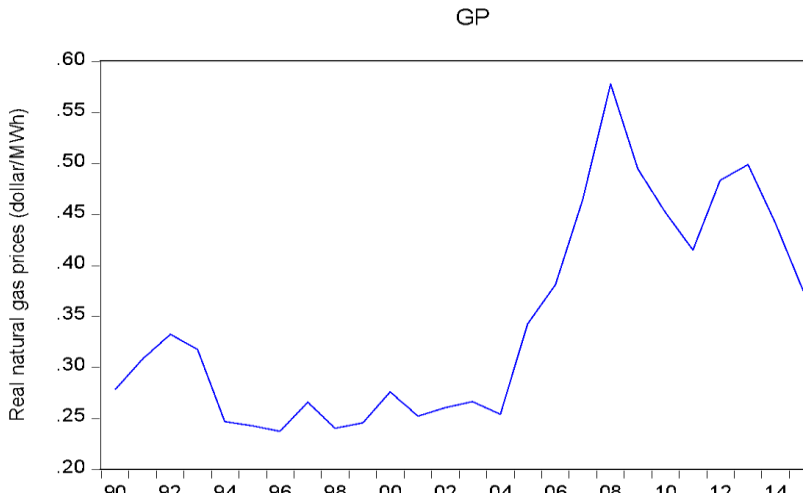
Table 2: Variables and Their Descriptions

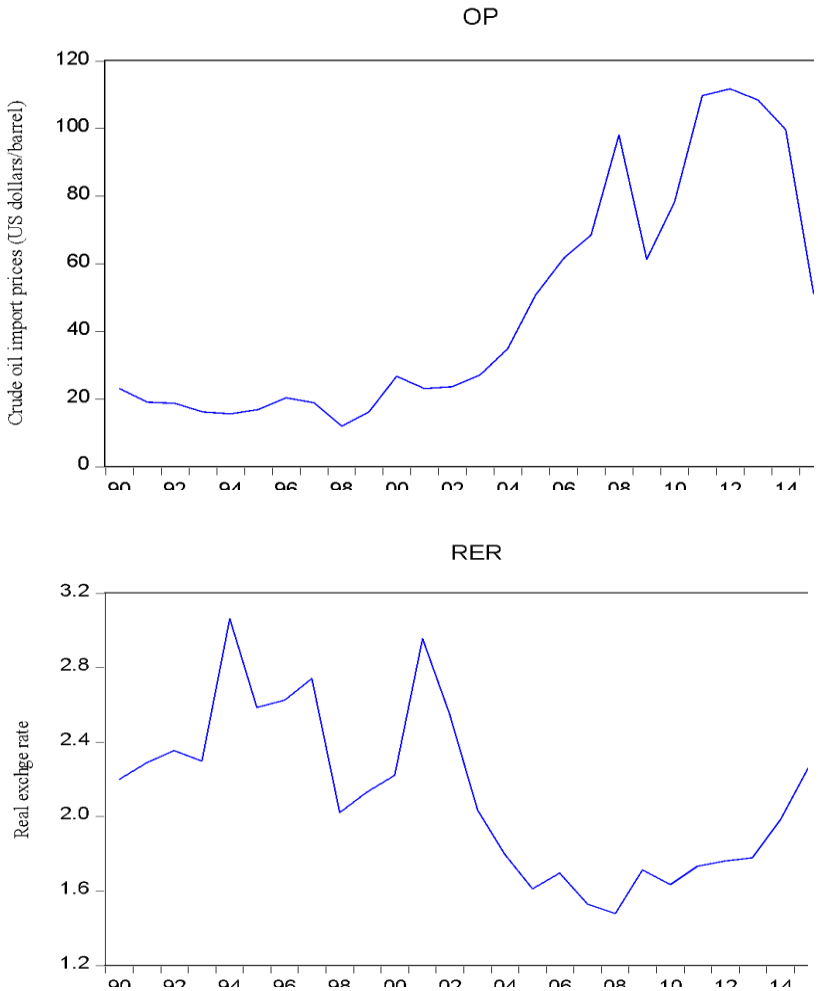
Variable	Description	Sources
ER	Exchange rate, national currency/USD	Penn World Table
PPP	GDP (LCU per international $)	World Bank Database
RER*	Exchange Rate/ Purchasing Power Parity	Penn World Table and World Bank Database
OP**	Crude oil import prices (US dollars/barrel)	OECD
GP***	gas prices for household (US dollar/MWh)**	IEA

Note:* This variable was calculated by the authors. ** The Crude oil import price was calculated using the deflator for GDP at market prices and rebased with reference year 1970 = 100.
***deflated using the GDP deflator of the United States

The charts for time series of variables used in the study for Turkey are shown in Figure 1.

Figure 1: Charts of Time Series of Variables Used in the Study





According to the chart for the household gas prices, the household gas prices have remained at low levels from 1990 to 2005. However, after 2005, the price had increased and the household gas price peaked together with the 2008 global economic crisis while it had decreased after 2008 and hit rock bottom in the 2011-2012 period. Increasing prices in the period 2012-2014 have decreased after 2014. Crude oil import prices started to increase after 2002 and this trend came to an end with the peak of oil prices during the 2008 global economic crisis. Crude oil import oil price, which started to diminish after 2008, hit rock bottom in the period 2009-2010 and after that had increased until 2011. After 2012, crude oil import prices have declined. When the charts related to household gas

prices and crude oil import prices are examined, it is seen that there has been parallelism with a one or two year lag between gas prices and oil prices after 2002. This implies that the relationship between gas and crude oil import prices has been increasing. In Turkey, the real exchange rate had increased during the times of local crisis (i.e. crisis in 1994, 1998-1999, and 2001) while the real exchange rate had decreased during the 2008 global economic crisis. However, after 2008, the real exchange rate has followed an increasing trend.

3.2. Estimation Techniques

The impacts of crude oil import price and real exchange rate on household gas prices have been examined via the ARDL method, GC test, impulse-response functions, and variance decomposition. First, variables were tested through unit root tests to examine the stationarity of the variables. Then the ARDL bounds test method was used to obtain co-integration and short and long-run coefficients. The GC test was applied to examine whether there is a causality between variables. Finally, the obtained results and evidence are tried to be verified by the impulse-response and variance decomposition methods.

Before the estimation of the model expressed by Equation (1), the stationary characteristics of the series of the variables in the model were examined. Augmented Dickey Fuller-ADF (1981) and Phillips and Perron-PP (1988) unit root tests were used to test the stationarity of the variables. The null hypothesis for these tests was that the series contain unit root whereas the alternative hypothesis was that the series does not contain the unit root.

Since a long-run relationship between household gas prices and the oil prices has been investigated, the stability of the series was examined by considering that there may be a structural break, via Zivot and Andrews-ZA (1992) test, which considers structural breaks. The ZA test is a test that pays regard to a single break and assumes a break period is determined internally in the model. If the *t* statistics calculated in the ZA test are larger than the table critical values of Zivot and Andrews (1992) in absolute value, the basic hypothesis of unit root is rejected. Perron (1989) has shown that standard ADF tests tend to non-rejection of the unit root hypothesis in the presence of structural variations since it can be misleading to decide whether variables are stationary based on standard

unit root test results. Hence, the ZA unit root test was applied to all variables.

Since the ARDL bounds test approach, which is created by Pesaran et al. (2001), allows the cointegration method to be applied in series, which are stationary at different levels, it differs from Engle and Granger (1987) and Johansen and Juselius (1990) co-integration tests. When the data set is considered, the ARDL model used in the study for co-integration is presented in Equation (2).

$$\Delta \ln GP_t = \alpha_1 + \sum_{i=1}^{p1} \phi_{1i} \Delta \ln GP_{t-i} + \sum_{j=0}^{q1} \delta_{1j} \Delta \ln OP_{t-j} + \sum_{k=0}^{r1} \theta_{ik} \Delta \ln RER_{t-k} + \gamma_1 \ln GP_{t-1} + \gamma_2 \ln OP_{t-1} + \gamma_3 \ln RER_{t-1} + \varepsilon_{t1} \quad (2)$$

Here; Δ, is a difference operator; ε_t, is a term for standard error. Terms ϕ_1, ϕ_2, ϕ_3, indicates the short-run relationship while $\gamma_1, \gamma_2, \gamma_3$ state the long-run relationship. In the model, the relationship between the variables was investigated by using the above-mentioned unrestricted error correction model-VECM and with respect to the *F* statistics. Hypotheses regarding the *F* test statistics are given below.

$$H_0 = \gamma_1 = \gamma_2 = \gamma_3 = 0 \text{ (there is no cointegration)}$$
$$H_1 = \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq 0 \text{ (there is cointegration)}$$

The appropriate lag length is determined by considering the information criterion of the Schwarz Bayesian Criterion (SBC). If the estimated *F-test* statistic is higher than the upper critical bound, the null hypothesis that there is no cointegration is rejected (i.e. there is co-integration) while the null hypothesis cannot be rejected if the estimated *F-test* statistic is under the lower critical bound (i.e. there is no cointegration). If the estimated *F-test* statistic is between the lower and upper limits, no definite comment can be made as to whether or not co-integration occurs.

If there is a long-run relationship (co-integration) between the variables, the long-run and the short-run models which are presented in Equation 3 and Equation 4, respectively, are estimated.

$$\ln GP_t = \alpha_2 + \sum_{i=1}^{p2} \phi_{2i} \Delta \ln GP_{t-i} + \sum_{j=0}^{q2} \delta_{2i} \Delta \ln OP_{t-j} + \sum_{k=0}^{r2} \theta_{2i} \Delta \ln RER_{t-k} + \varepsilon_{t2} \quad (3)$$

$$\Delta \ln GP_t = \alpha_3 + \sum_{i=1}^{p3} \phi_{3i} \Delta \ln GP_{t-i} + \sum_{j=0}^{q3} \delta_{3j} \Delta \ln OP_{t-j} + \sum_{k=0}^{r3} \theta_{3k} \Delta \ln RER_{t-k} + \varphi ECT_{t-1} + \varepsilon_{t3} \quad (4)$$

Here, φ is the coefficient of the error correction term. It indicates how swiftly the variables have reached equilibrium and should have a statistically significant and negative sign.

The GC test was performed to specify the causality between variables (Table 6). The GC test consists of estimating the following equations:

$$\Delta \ln GP_t = \vartheta_0 + \sum_{i=1}^{n} \vartheta_{1i} \Delta \ln GP_{t-i} + \sum_{i=1}^{n} \vartheta_{2i} \Delta \ln OP_{t-i} + \sum_{i=1}^{n} \vartheta_{3i} \Delta \ln RER_{t-i} + u_1 \quad (5)$$

$$\Delta \ln OP_t = \varphi_0 + \sum_{i=1}^{n} \vartheta_{1i} \Delta \ln OP_{t-i} + \sum_{i=1}^{n} \varphi_{2i} \Delta \ln GP_{t-i} + \sum_{i=1}^{n} \varphi_{3i} \Delta \ln RER_{t-i} + u_2 \quad (6)$$

$$\Delta \ln RER_t = \square_0 + \sum_{i=1}^{n} \vartheta_{1i} \Delta \ln RER_{t-i} + \sum_{i=1}^{n} \square_{2i} \Delta \ln GP_{t-i} + \sum_{i=1}^{n} \square_{3i} \Delta \ln OP_{t-i} + u_3 \quad (7)$$

In the above-mentioned equations; $\vartheta_i, \varphi_i, \square_i$ are coefficients, *n* is the optimum lag length, u_i is the error term, ln*GP*, ln*OP* and ln*RER* are the time series of which causality relationships are searched and Δ is a difference operator.

In order to evaluate the diagnostic test results of the model, the Breusch-Godfrey LM test for the auto-correlation test, the Jarque-Bera test for normality test, White test for heteroscedasticity test, and Ramsey Reset test for the correct use of the model were used. Then, CUSUM and CUSUMSQ graphs, which are developed by Brown et al. (1975) to test the stability of the long-run ARDL coefficients, were presented. After that, causality analysis developed by Granger (1969) was conducted to determine the direction of the relationship between the variables.

Finally, impulse-response functions and variance decomposition tools were used to interpret the dynamic structure of the model. Variance decomposition is an analysis technique that shows what percentage of

change in any given variable is directly dependent on the variable itself, and what percentage depends on other variables. If a large part of the change in a variable arises from its shocks, this implies that such the variable acts exogenously. However, if the change in a variable arises from other variables in the model, it is indicated that the variable is endogenous (Enders, 1995: 311). The impulse-response analysis shows how and to what extent each variable in the model reacts to the shocks that occur in the error terms and as well as how and to what extent the other variables react. In other words, these functions show the own reaction of each variable to one unit shock or the reaction of other variables to such shock.

4. Empirical Results

4.1. Testing For Unit Roots

The results of the ADF and PP unit root tests are shown in Table 3. As a result of the ADF and PP unit root tests, it is concluded that all variables are non-stationary at the level values. However, when the first differences of these variables are taken, it is seen that the series becomes stationary, which is I (1).

Table 3: The Unit Root Test Results for Variables

Variables	ADF		PP	
	Constant	**Constant and trend**	**Constant**	**Constant and trend**
lnGP	-1.3323	-1.3710	-1.4722	-1.6437
	(0.5989)	(0.8455)	(0.5314)	(0.7469)
lnOP	-1.0297	-1.4863	-1.0297	-1.4863
	(0.7271)	(0.8082)	(0.7271)	(0.8082)
lnRER	-1.6813	-1.7971	-1.6917	-1.8644
	(0.4285)	(0.6769)	(0.4235)	(0.6437)
lnΔGP	-3.7469	-3.6800	-3.7613	-3.6966
	(0.0095)***	(0.0429)**	(0.0092)***	(0.0415)**
lnΔOP	-4.2201	-4.1772	-4.1835	-4.1333
	(0.0031)***	(0.0153)**	(0.0034)***	(0.0168)**
lnΔRER	-5.2601	-5.2079	-5.2610	-5.2097
	(0.0003)***	(0.0016)***	(0.0003)***	(0.0016)***

***1% significance level, **5% significance level

Note: Δ, indicates the first difference of the variables.

Gas prices, which are dependent variables in the model, are stationary at I (1) level in fixed and fixed and trending models. This indicates that the precondition of the ARDL model has been met.

The results of the Zivot-Andrews unit root test are presented in Table 4. Table 4 demonstrates the test statistics generated for the breaking in constant and constant and trending models of the series, the corresponding critical values, and structural break periods determined with respect to minimum *t* statistics.

Table 4: The Zivot-Andrews Unit Root Test

	Constant		**Constant and trend**	
Variables	**Min. t-Statistic**	**Break Period**	**Min. t-statistic**	**Break Period**
lnGP	-3.892 (1)	2005	-3.463 (1)	2007
lnOP	-2.236 (0)	2005	-3.267 (0)	2011
lnRER	-3.759 (0)	2003	-3.629 (0)	2003
Critical Values : 1% : -5.34 5% : -4.93			Critical Values : 1% : 5.57 5% : -5.08	

Note: Values in parentheses indicate the number of lags. Critical values of both models are taken as the Zivot and Andrews (1992: 258).

No variable can reject the null hypothesis that there is a structural breaking unit root for both fixed and fixed and trending models. Therefore, it is seen from the results of the Zivot-Andrews unit root test that structural breaks in the series do not significantly affect results of the traditional ADF unit root test and that all series are at I(1) level.

4.2. Co-integration And Short- And Long Term Results

The results of the cointegration test are given in Table 5. The estimated *F-test* statistic is greater than the upper critical value of both 5% and 10% significance level. Moreover, because the sample size is small, the *F-test* statistic is also higher than the upper critical value both at 5% and 10% significance level according to critical values suggested by Narayan (2005). For this reason, the hypothesis that there is no cointegration in the model (H_0) is rejected. Specifically, these results indicate that there is a long-run relationship between variables. This result is supported by the studies of Brigida (2014), Hartley and Medlock III (2014), Ramberg and Parsons (2012), Bachmeier and Griffin (2006), Panagiotidis and Rutledge (2007), and Lin and Li (2015). A common conclusion from

these studies is that there is a relationship between gas prices and crude oil prices.

Table 5: The Conclusions of Cointegration tests

	F- statistic	**k**
	6.09	2
Critical Value Bounds		
Significance level	**I(0)**	**I(1)**
10 %	3.17	4.14
5 %	3.79	4.85
1 %	5.15	6.36
Narayan (2005)		
10%	3.43	4.47
5%	4.26	5.47
1%	6.18	7.87

Note: k, represents the number of independent variables.

The estimation results of the models that are expressed by Equations (3) and (4) are given in Table 6. In the model, the information criteria of Schwarz Bayesian Criterion (SBC) and 4 lags were taken into consideration in determining the lag lengths. Specifically, the short and long-run coefficients of the ARDL (1, 0, 0) model are tendered in Table 6.

The short- and long-run results from ARDL presented in Table 6. In the short-run, the coefficient for crude oil import prices was estimated at 0.10. As expected, this coefficient is positive and statistically significant at a 10% significance level. The 1% increase in crude oil import price, increases the household gas price by 0.10%. Also, the 1% increase in the real exchange rate reduces the household gas price by 0.33%. This coefficient is statistically significant at a 5% significance level. In the long run, the coefficient for crude oil import price is estimated at 0.22. The 1% increase in crude oil import price increases household gas prices by 0.22%. The 1% increase in the real exchange rate reduces the household gas price by 0.71% in the long run. Nonetheless, it was concluded that the positive impact of crude oil import prices on gas prices is more in the long-run when compared with the short-run. These results confirm the results of Ramberg and Parsons (2012), Panagiotidis, and Rutledge (2017). Here, *ECT*, which has a statistically significant coefficient with a negative sign (-0.47), demonstrates that about 47% of a deviation at time

t-1 will be corrected at time *t* (Table 6). That is to say, if in the short-run, there is a deviation from the long-run equilibrium, the system will reach the equilibrium in 2 quarters (1/0.47=2.12).

Table 6: Short- And Long-Term Coefficients

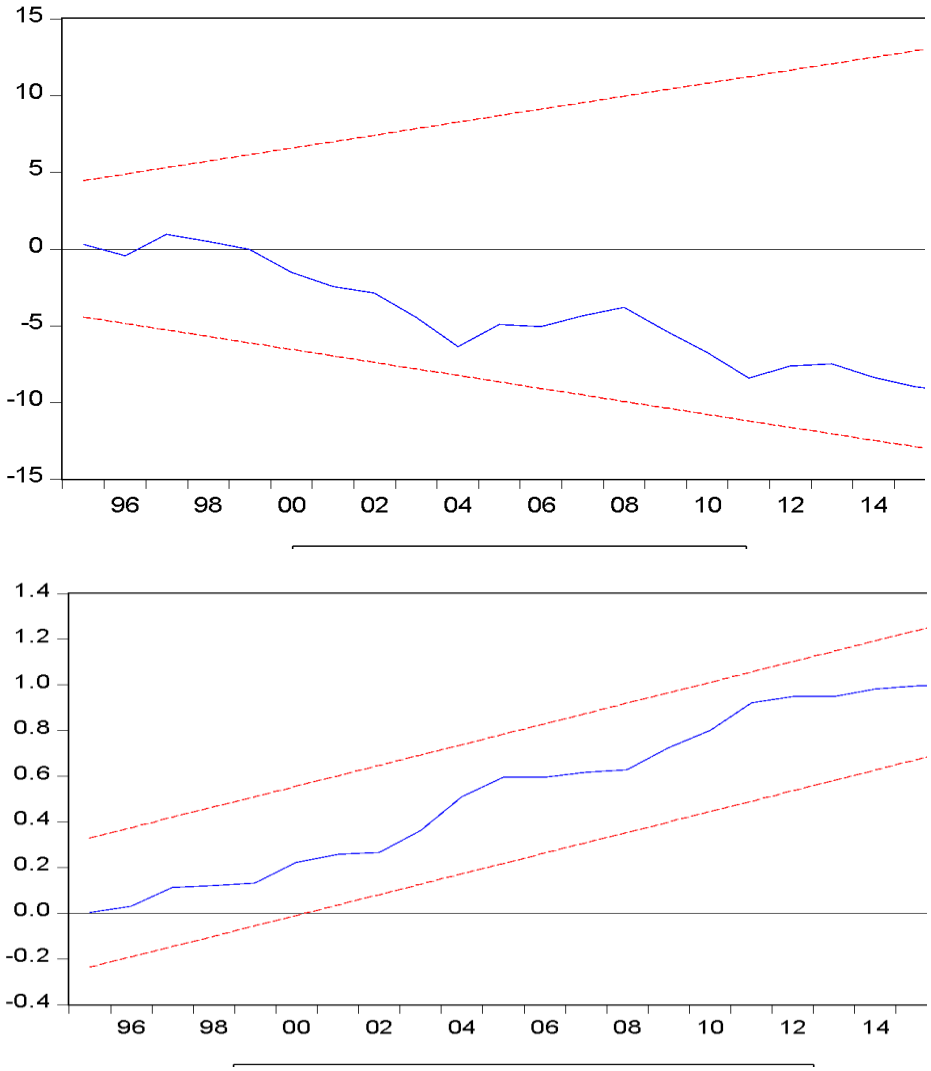
Short Term Coefficients			
Variables	**Coefficient**	**Std. error**	**t-Statistic**
Constant	-0.6541	0.3431	-1.9064*
lnGP(-1)	0.5277	0.1080	4.8837***
lnOP	0.1070	0.0526	2.0342*
lnRER	-0.3361	0.1338	-2.5105**
ECT(-1)	-0.4722	0.1080	-4.3706***
Long Term Coefficients			
Variables	**Coefficient**	**Std. error**	**t-Statistic**
Constant	-1.3851	0.5219	-2.6537**
ln*OP*	0.2266	0.0834	2.7144**
ln*RER*	-0.7116	0.3443	-2.0665*
R^2	0.9082		
Adj R^2	0.8957		
F-statistic	72.5883[a]		
DW	1.5993		
Diagnostic tests	**Statistic**	**Prob. value**	
χ^2 *NORMAL*	0.0843	0.9586	
χ^2 *SERIAL*	0.6830	0.5165	
χ^2 *WHITE*	0.4514	0.8861	
χ^2 *RESET*	0.2369	0.6314	

***1% significance level, **5% significance level, **10% significance level

Note: χ^2 NORMAL, the Jarque-Bera test for normality; χ^2 SERIAL, the Breusch-Godfrey Serial Correlation LM (autocorrelation) test; χ^2 WHITE, Heteroscedasticity test; χ^2 RESET, the Ramsey Reset test.

When the diagnostic test results of the model are evaluated, it is seen that there is no auto-correlation problem in the model according to the Breusch-Godfrey LM test results, the error term is normally distributed according to the Jarque-Bera test results, there is no variance problem in the model according to the White test results and the model was established with the right specifications according to the Ramsey Reset Test results. Therefore, these results support that the estimation results obtained are reliable. CUSUM and CUSUMSQ graphs, which are developed by Brown et al. (1975) to test the stability of the long-run ARDL coefficients, are presented in Figure 2.

Figure 2: CUSUM and CUSUMSQ



According to these tests, the calculated coefficients are stable because the curves, which are obtained as a result of test statistics for error terms, are between the critical limits at the level of 5% significance. Hence, the stability of long-run estimates has been confirmed.

4.3. Results of Causality Test Between Variables

The GC test was carried out to specify the direction of the relationship between variables. GC test result demonstrated in Table 7. According to the GC test results, there is no causality between the crude oil import prices and the household gas prices. However, there is unidirectional causality from the real exchange rate to the gas prices. Also, there is unidirectional causality from the real exchange rate to the crude oil import price at a 10% significance level. Méndez-Carbajo (2011) has concluded that there is a unidirectional causality between gas price and the real exchange rate. Wang and Wu (2012) found a unidirectional nonlinear causality from the exchange rate to the natural gas price. These results support the result obtained while do not support the result that there is a unidirectional linear causality from crude oil import prices to natural gas price and bi-directional non-linear causality between crude oil import prices and gas prices which are obtained by Geng et al. (2017).

Table 7: Findings of Causality Test Between Variables

Variables	**lnGP**	**lnOP**	**lnRER**
lnGP	-	1.4178 (0.2656)	4.9108** (0.0184)
lnOP	0.2644 (0.7703)	-	2.6006 (0.0991)*
lnRER	0.0283 (0.9721)	0.0804 (0.9230)	-

**5% significance level

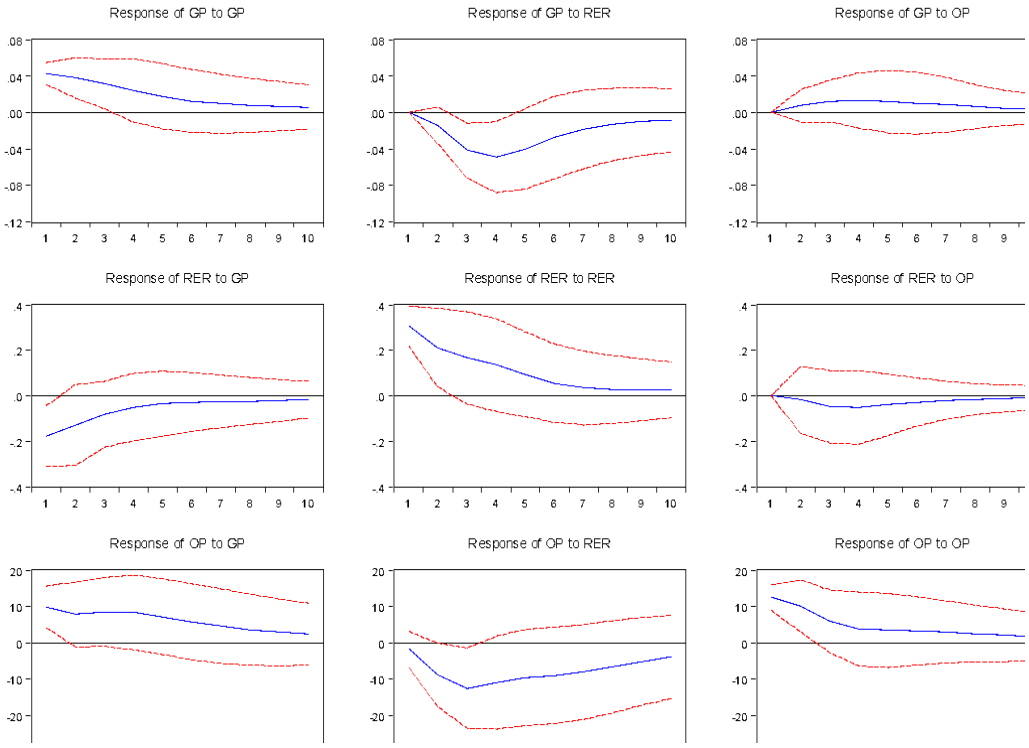
**10% significance level

Note: Expressions in parentheses indicate p-value (probability) value.

4.4. Results of Impulse-Response Functions and Variance Decomposition Analysis

The results of impulse-response functions and variance decomposition used for estimating the reaction of household gas prices to a shock in crude oil import price and in the real exchange rate are presented in Figure 3 and Table 8 respectively.

Figure 3: Impulse-Response Function



The findings obtained from the impulse-response functions affirms the results of the ARDL model. As a response to a standard error shock in crude oil import price (ln*OP*), the household gas price (ln*GP*) had given positive but increasing reaction until the middle of the fifth period. After this period, the reaction has continued to be positive but declining. On the other hand, as a response to a standard error shock in the real exchange rate (ln*RER*), the household gas price (ln*GP*) had given negative but the declining reaction until the middle of the fourth period. In the following periods, however, the reaction has been negative but increasing. Obtained impulse-response and variance decomposition results support the results of Ji et al. (2014). The variation in gas and oil prices affects investment decisions of the private firms in the production process while influencing the welfare level of the household in the consumption process. Therefore, as Atil et al. (2014) point out, the development of appropriate energy policies in the production and consumption stages requires the strategic

development of alternative energy sources and the adjustment in oil and gas prices.

Table 8: Variance Decomposition (V.D.)

V.D. of GP					**V.D. of RER**				**V.D. of OP**			
	S.E.	GP	RER	OP	S.E.	GP	RER	OP	S.E.	GP	RER	OP
1	0.04	100.0	0.000	0.00	0.35	25.06	74.93	0.00	15.88	37.89	1.32	60.78
2	0.06	92.95	5.55	1.48	0.43	25.66	74.16	0.16	22.16	31.62	16.67	51.69
3	0.08	66.24	30.48	3.26	0.47	24.42	74.42	1.14	27.51	30.03	31.83	38.12
4	0.09	50.42	45.61	3.95	0.49	23.10	74.78	2.10	30.99	30.76	37.71	31.52
5	0.10	44.18	51.34	4.46	0.50	22.51	74.84	2.63	33.37	31.07	40.74	28.18
6	0.11	41.84	53.21	4.94	0.51	22.40	74.69	2.89	35.18	30.61	43.17	26.20
7	0.11	40.92	53.78	5.28	0.51	22.45	74.53	3.01	36.50	29.99	45.01	24.99
8	0.11	40.54	53.96	5.48	0.51	22.52	74.39	3.07	37.35	29.55	46.13	24.31
9	0.11	40.37	54.03	5.59	0.51	22.57	74.31	3.11	37.86	29.32	46.72	23.94
10	0.11	40.27	54.08	5.64	0.51	22.60	74.26	3.13	38.17	29.22	47.030	23.747

As a result of the variance decomposition analysis the household gas price is affected by its own lags at 100% in the first period while in the second period, it is affected by its own lags at 92.9%. Besides, in the second period, the household gas prices are affected by the real exchange rate at 5.5% and by crude oil import price at 1.48%. At the end of ten semesters, gas price is affected by their own lags at 40.2%, while it is affected by the real exchange rate at 54.08% and by crude oil import price at 5.64%. Meanwhile, the fact that most of the changes in the household gas price do not originate from the shocks of itself implies that household gas price moves intrinsically.

5. Conclusion

In this study, the impact of the crude oil import price on the gas price was examined. Besides, the effect of the real exchange rate on the gas price is taken into consideration as a control variable. The results of the study provide strong evidence to support the assertion that is linear in the relationship between oil and gas that is expressed in empirical studies.

The ARDL bounds test method was used to determine the short and long-run relationship between gas price and crude oil import price. As a result of this test, it is concluded that there is a long-run relationship between gas prices and crude oil import prices. Besides, in the short-run, it was determined that the crude oil import price has affected gas prices positively. The reason why crude oil prices positively affect household gas prices can be expressed as an increase in crude oil prices prompting end-users to substitute gas for petroleum products in consumption. The realization of this situation increases the demand and therefore the prices of gas. Increasing crude oil prices due to the increase in crude oil demand increases gas production and development costs (Villar and Joutz, 2006). This increase may also cause an increase in gas prices. The fact that the increase in oil prices puts gas prices on an upward trend puts pressure on the limited budget of the household. Therefore, changes in oil prices can change the policies of companies, economic policies of countries, and relations between countries. It is found in the study that the real exchange rate has a significant and negative impact on gas prices both in the short and the long-run. This result shows that gas prices are affected by the fluctuations in the real exchange rate.

Whether there is a causality between gas prices and crude oil import prices are tested by the GC test. As a result of this test, it is concluded that there is no causality between the crude oil import price and the gas price while there is unidirectional causality from the real exchange rate to the gas price. Results of impulse-response functions and variance decomposition, which are used to examine the dynamic impact of variations in the crude oil import price and the real exchange rate on the gas price, support the obtained results. According to the impulse-response functions, crude oil import price affects gas prices positively, while the real exchange rate affects it negatively. Variance decomposition results imply that household gas prices move intrinsically.

Gas and oil are two sources of energy that are extremely important for the economy of Turkey. The relationship between crude oil and gas prices seems to be strong and positive in Turkey. Turkey has a high degree of dependence on oil imports. Hence, because an increase in oil price increases the consumption of high-grade gas, this increase in demand will lead to an increase in household gas prices. From this point forth, Turkey should increase investments in gas projects corresponding to the increasing gas consumption. Also, to reduce the increasing effect of crude

oil prices on gas prices, gas supply should be increased. The way to achieve this is to discover cheap gas resources in its geography and to make cheap gas agreements with the surrounding gas-rich countries. At the same time, since gas is a cleaner source of energy, it might be effective in reducing air pollution by increasing gas consumption through price.

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Evaluation of Convergence of Per Capita Income and Its Determinants in Southern African Development Community

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ABSTRACT

This study examines whether there has been a tendency toward convergence of per capita income of member state in Southern African Development Community SADC, as well as identifying factors responsible for such convergence. Annual data for GDP per capita, Inflation rate, fiscal deficit, foreign direct investment and openness to trade from 1980 to 2016 were obtained from relevant sources. The stochastic convergence approach (unit root and cointegration technique) was applied to the data. The results revealed that, there was convergence in real per capita income towards South Africa's income in nine (9) countries (Madagascar, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe) but divergence in five (5) countries (Angola, Botswana, DR Congo, Lesotho and Malawi). Foreign direct investment (FDI) was identified as the most common determinant of convergence in all SADC countries except Zimbabwe. Other determinants include; economic growth, fiscal deficit, inflation and Openness to trade. Based on the findings the study recommends that foreign direct investment should be encouraged particularly among those countries that experience divergence in the SADC region. Low fiscal deficit and a stable inflation rate should be pursued to guarantee macroeconomic stability in order to sustain convergence.

ملخص

تبحث هذه الدراسة في ما إذا كان هناك اتجاه نحو تقارب دخل الفرد في دولة عضو في الجماعة الإنمائية للجنوب الأفريقي (SADC)، وكذلك تحديد العوامل المسؤولة عن هذا التقارب. وقد تم الحصول على البيانات السنوية لنصيب الفرد من الناتج المحلي الإجمالي ومعدل التضخم والعجز المالي والاستثمار الأجنبي المباشر والانفتاح على التجارة في الفترة ما بين 1980 و 2016 من المصادر ذات الصلة.كما تم تطبيق نهج التقارب العشوائي (تقنية جذر الوحدة والاندماج المشترك) على

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البيانات. وكشفت النتائج أنه كان هناك تقارب في الدخل الحقيقي للفرد إلى دخل جنوب إفريقيا في تسعة (9) دول (مدغشقر وموريشيوس وموزمبيق وناميبيا وسيشيل وسوازيلاند وتنزانيا وزامبيا وزيمبابوي) وتباعد في خمسة (5) دول (أنغولا وبوتسوانا والكونغو الديمقراطية وليسوتو وملاوي). وتم تحديد الاستثمار الأجنبي المباشر (FDI) باعتباره المحدد الأكثر شيوعا للتقارب في جميع بلدان الجماعة الإنمائية للجنوب الأفريقي باستثناء زمبابوي.وتشمل المحددات الأخرى؛ النمو الاقتصادي والعجز المالي والتضخم والانفتاح على التجارة. واستنادا إلى النتائج، توصي الدراسة بضرورة تشجيع الاستثمار الأجنبي المباشر، خاصة بين البلدان التي تعاني من الاختلاف في منطقة الجماعة الإنمائية للجنوب الأفريقي. كما ينبغي السعي وراء الحفاظ على انخفاض عجز المالية العامة واستقرار معدل التضخم لضمان استقرار الاقتصاد الكلي من أجل استدامة التقارب.

ABSTRAITE

Cette étude examine s'il y a eu une tendance à la convergence du revenu par habitant des États membres de la Communauté de développement de l'Afrique australe (SADC), ainsi que l'identification des facteurs responsables de cette convergence. Les données annuelles concernant le PIB par habitant, le taux d'inflation, le déficit budgétaire, l'investissement direct étranger et l'ouverture au commerce de 1980 à 2016 ont été obtenues auprès de sources pertinentes. L'approche de convergence stochastique (racine unitaire et technique de cointégration) a été appliquée aux données. Les résultats ont révélé une convergence du revenu réel par habitant vers le revenu de l'Afrique du Sud dans neuf (9) pays (Madagascar, Maurice, Mozambique, Namibie, Seychelles, Swaziland, Tanzanie, Zambie et Zimbabwe) mais une divergence dans cinq (5) pays (Angola, Botswana, RD Congo, Lesotho et Malawi). L'investissement direct étranger (IDE) a été identifié comme le déterminant le plus commun de la convergence dans tous les pays de la SADC, à l'exception du Zimbabwe. Les autres facteurs déterminants sont la croissance économique, le déficit budgétaire, l'inflation et l'ouverture au commerce. Sur la base des conclusions de l'étude, il est recommandé d'encourager les investissements directs étrangers, en particulier dans les pays qui connaissent des divergences dans la région de la SADC. Un faible déficit budgétaire et un taux d'inflation stable devraient être recherchés pour garantir la stabilité macroéconomique afin de soutenir la convergence.

Keywords: Per Capita Income, Convergence, Determinants, SADC

JEL Classification Code: F15, F63, O57

1. Introduction

The Southern African Development Community (SADC) was established as a development coordinating conference (SADCC) in 1980 and transformed into a development community in 1992. It is an inter-governmental organization whose goal is to promote sustainable and equitable economic growth and socio-economic development through efficient productive systems, deeper co-operation and integration among fifteen Southern African member states namely: Angola, Botswana, DR Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.
In 1992 when the SADC was established there was wide disparity in the per capita incomes of member states. South Africa had the highest GDP per capita at US$6,962, followed by Namibia with US$4,357. Other high-income countries in the region were Mauritius (US$2,303), Botswana (US$1,900), and Swaziland (US$1,441). Countries with low per capita income in the SADC region, with income levels below US$800, were Malawi (US$407), Mozambique n(US$189), Lesotho (US$533) and Madagascar (US$619). These fifteen member States are still at different stages of development, but predominantly underdeveloped (World Development Indicator 2014).

Idea of convergence of per capita income among member states of SADC is to ensures that the per capita income of poorer countries grows at a faster rate than that of the developed ones among them. It is necessary for economic growth of countries in SADC to converge for the goals of attaining a faster growth, reduce income inequality, and minimizing the poverty gap among countries in the region. Thus 27 years after establishment of SADC in 1992, it is still not clear whether there is any meaningful prospect towards the convergence of the per capita income of member states.

Given these seemingly wide disparities in their per capita income, it will be of interest to determine if there is any discernible tendency towards the convergence of their per capita income and hence reduction of income disparity among member states in line with one of the objectives of SADC. It is also necessary to determine the factors responsible for the convergence or lack of it. Hence, this paper examines whether there has

been a systematic tendency for convergence of per capita income within members' state in SADC, with South Africa being the largest economy in the SADC as a benchmark. The paper also identified factors responsible for the convergence of per capita income among SADC states.

2. Literature Review

2.1 Conceptual Literature (Concept of Convergence of per capita income)

The idea of convergence of per capita income is anchored on the Solow-Swan model of economic growth. It hypothesizes that, poorer economies' per capita incomes will tend to grow at faster rates than those of richer economies and then to catch-up with them in the long-run. Convergence can also be referred to as the Catch-up effect. In a situation of convergence, developing countries have the potential to grow at a faster rate than developed countries because diminishing returns (in particular to capital) are not as strong as in capital rich (developed) countries. Also, poorer countries can as well replicate the production methods, technologies and institutions of developed countries. Convergence is conditional, depending on the ability of the economies to become more competitive. The main source of this competitiveness is found in their technical progress, innovation ability, capital accumulation and human capital formation (Wolassa, 2011).

2.2 Theoretical Framework

There are two dominant theoretical perspectives used in the studies of convergence namely: neoclassical and endogenous growth theories. These theories attempt to quantify the extent to which the growth process leads to convergence or divergence in regional performance over time. The theories are discussed below.

2.2.1 Neoclassical Growth Theory

The theory is built on the assumptions of diminishing returns to capital and factor mobility. It predicts that economic integration among national and regional economies would inevitably result in per capita income convergence. This will further lead to more capital accumulation and

faster economic growth in poor countries (regions) than in rich ones resulting in economic convergence towards a common level of per capita income in the long run. This phenomenon is commonly known as the convergence hypothesis in the economic literature. Traditional neoclassical growth models, which assume exogenous and universal technological progress and diminishing returns to capital accumulation, predict convergence of countries to the same steady-state rate of growth and level of income and capital per person, with initially poor countries catching up but not overtaking the leaders.

2.2.2 Endogenous Growth Theory

This is an economic theory which argues that economic growth is generated from within a system as a direct result of internal processes. It explains further that investment in human capital, innovation and knowledge, rather than external factors are significant contributors to economic growth. As cited by Wolassa (2011), the theory was advanced by Romer (1986) and Solow (1988). They condemned the neoclassical growth theory insisting that there are no inherent factors that makes for convergence. It maintains that there is no explicit tendency of poor countries to catch–up with the advanced countries. According to the endogenous growth theory, there is divergence rather than convergence.

Supporters of endogenous growth theory argue that the productivity and economies of today's industrialized countries compared to the same countries in pre-industrialized eras are evidence that growth was created and sustained from within the country and not through trade. It insists that policies, internal processes and investment capital, rather than external factors, are chiefly responsible for economic growth.

The new economic geography developed Krugman and Venables (1995) supports endogenous growth theory maintaining that economic integration may not lead to income convergence. Whereas neoclassical growth theory is based on the assumptions of increasing returns in physical or human capital and positive externalities, the new economic geography maintains that countries or regions with higher levels of physical or human capital may continue to grow more rapidly as growth generates positive spillover effects that produce further growth. Conversely, poorer countries (regions) may not be able to accumulate

the required physical and human capital to generate the positive spillovers that facilitate self-sustained economic growth.

In a similar vein, the new trade theory argues that although economic integration creates new opportunities for economies of scale and specialization resulting from increased trade and factor mobility, it does not necessarily follow that all integrating countries (regions) benefit from it equally. It insists that earlier stages of integration tend to bring larger gains for already more industrialized regions, as firms exploit economies of scale by concentrating production close to markets where they have more customers and suppliers. This process tends to increase income differences between rich and poor countries (regions). The endogenous growth theory is in contrast to the exogenous growth theory, in that the productivity growth is the outcome of incentive structures that may differ across countries, entertain the possibility of persistent divergence in growth performance and thus of the overtaking of one country by another or of ever-widening gaps between leaders and followers. The root of this difference is their treatment of technical change and returns to capital accumulation.

It is clear that none of these two theories, on its own is capable of explaining the process of integration in SADC. Thus, an eclectic approach is used in this study that combines the strengths in each.

2.3 Empirical Literature Review

The empirical literature review is divided in to two namely: empirical literature review on per capita income convergence and empirical literature review on determinants of per capita income convergence

2.3.1 Literature on Per Capita Income Convergence

The notion that economic integration among countries or regions within a country leads to economic convergence has been widely debated in the growth and development literature over the last four decades. Starting with empirical literature that supports economic convergence, Haider et al. (2010) examined whether there is an income convergence over time in South Asian economies as well as comparing the convergence results of South Asian economies with its parallel East Asian region within the Asian block using beta and sigma convergence methodologies as well as Theil's inequality-based approach. Their result indicated no evidence to

the existence of absolute income convergence but revealed the presence of conditional income convergence for both East and South Asian economies, implying that, the income gap between these two groups of economies had narrowed down based on some common characteristics over time.

Basil (2002) examined economic integration and convergence of per capita income in West Africa, using both cross sectional and time series approach to investigate the convergence and test for beta and sigma convergence. He examined the tendency for income levels to converge within a group of homogenous ECOWAS countries similar in key macroeconomic variables like, similarities in preferences, technologies, government policies and some strategic factors of production. His results showed that there has indeed been convergence in real per capita GDP across ECOWAS economies. While convergence occurred, the speed at which the initially poor economies are catching up with the rich economies was slow. This explains the fact that the cross-country income inequality is disappearing overtime.

Carmignani (2006) used the cointegration technique to inflation and monetary aggregates to determine the degree of nominal convergence in Common Market for Eastern and Southern Africa (COMESA) from 1980 to 2002. The results reveal that there was partial convergence among the COMESA countries driven by the existence of independent policies.

Studies that do not favoured economic growth convergence or provided evidence that there is little observable tendency for poorer economies to catch up with richer ones includes, McCoskey (2002) investigates the convergence properties of six indicators of well-being for 37 Sub-Saharan African countries using both the panel unit root test and the panel cointegration test. The results showed no evidence of time series convergence across the whole sample for the real GDP-based variables. The finding was extended to cover more homogeneous groups of economies sharing some institutional arrangements such as the Southern African Development Community (SADC) and the Southern African Customs Union (SACU).

Similarly, Alagidede, P. & Tweneboah, G. (2015) estimated the extent of convergence and synchronization of business cycles within the west African Monetary Zone (WAMZ) using univariate and multivariate

unobserved components models over the period 1970 to 2011. The results showed a substantial divergence in the economic characteristics of member countries.

Artelaris et al. (2011) used quadratic weighted least squares regression analysis to examine convergence patterns in the world economy. Their result indicates that countries with a low to medium-high level of development show convergence while, countries with a medium-high to a very high level of development show divergence. Accordingly, they concluded that convergence and divergence co-exist but at different rates and with different strengths. That the forces of divergence appear to dominate after a certain threshold and further increases the world development gap.

Wolassa (2011) investigated convergence in real per capita GDP, macroeconomic policy and stability indicators within the SADC. Using the ADF unit root test, for the period of 1992-2009, the empirical test showed no evidence of absolute beta and sigma convergence in real per capita GDP among the SADC economies, he pointed out that the absence of convergence does not necessarily implies lack of economic growth. The empirical results also show that Botswana and South Africa's real per capita GDP converged to a common stochastic trend while the rest were characterized by a boundless drift.

Charles, Darne and Hoarau (2012) examines the absolute and conditional convergence of real GDP per capita in the Common Market for Eastern and Southern Africa (COMESA) during the period 1950-2003. Income departures across COMESA countries were evaluated from several panel data unit root tests. They found no evidence supporting the existence of convergence process for the income in the COMESA. They concluded that most economies of COMESA are locked into a sustained poverty trap process.

Gilles, Valerie and Theo (2010), argues that there has been no absolute convergence between the GDP per capita of developing countries since 1950 except only a few cases of income convergence of which only a few of them have grown faster than the others, namely the so-called emerging economies (Brazil, China, India, Mexico, South-East Asian countries, oil-exporting countries in the Middle East, Central and Eastern European countries). Using econometric methods (non-stationary long-memory models, wavelet models and time-varying

factor representation models), their result showed that, growth is an unusual phenomenon that yields different forms of transitional economic performance: growth tragedy (some countries with an initial low level of per capita income diverge from the richest ones), growth resistance (countries experiencing a low speed of growth convergence), and rapid convergence.

Solomon and Festus (2013) in their investigation of per capita income convergence hypothesis in Sub-Saharan Africa, using panel dataset for 37 countries from 1980 to 2010 and Panel Generalized Least Squares technique. Their study established per capita income divergence among the countries in Sub-Saharan Africa, with the level of divergence increasing with the inclusion of FDI, trade openness and government spending into the basic model. Their findings further suggested that regardless of the presence of FDI (Foreign Direct Investment), trade openness and per capita income, disparity gap among countries in SSA tends to diverge.

Our inference from literature reviewed above is that, as long as the issue of economic growth and development remains dynamic and determine by both internal and external factors, the idea of economic convergence and divergence will ever remain debatable. Hence, constant research in this area is important in order to provide specific results or appraisal of specific zones towards economic convergence or divergence in the face of ever changing economic phenomena. In line with this inference, though there have been a number of studies on economic integration and convergence in southern Africa, like Wolassa (2011) who studied Growth and Macroeconomic Convergence in SADC (1992- 2009) using ADF Unit root test, and obtained results that shows no tendency for convergence in real per capita GDP among the SADC countries. It is important to point out here that, Wolassa (2011) study is about ten (10) years now and many developments have taken place in the SADC region. The small sample size (17 years) then may have minimized the possibility of convergence among the SADC countries. Accordingly, this present study, used relatively a larger sample size (1992- 2016) to ascertain the tendency of convergence in SADC. Additionally, the study addresses the issues pertaining to the determinants of the observed convergence.

2.3.2 Literature on Determinants of Per Capita Income Convergence

Zhang (2001) explored the role of trade and FDI in a cross-country convergence analysis, indicating that export and FDI tend to accelerate the convergence process in the Asian newly industrialized economies and Japan.

Azam, M. (2016) examines the impacts of governance and foreign Direct investment (FDI) on economic growth in 20 countries from organization of Islamic Cooperation (OIC) using Probabilistic econometrics models based on growth theory and panel data set over the period 1986 to 2012. One of the results obtained was that, FDI impacted significantly on economic growth of the OIC.

Wahiba (2015) evaluated the conditional convergence hypothesis among African countries that belonged to the West African Economic and Monetary Union (WAEMU, using control variables such as: the share of investment in gross domestic product, enrolment and the opening ratio. The study revealed that these variables contribute to the revival of economic growth and convergence in the region.

Jawaid and Raza (2012) investigated the impact of FDI on income convergence in addition to the relationship between FDI and economic growth by using seven years average annual data of 129 countries across the world from the period of 2003 to 2009. These countries were grouped into low, middle and high income by the World Bank. Results indicated a significant positive relationship between foreign direct investment and economic growth in all countries. Results of conditional convergence based on foreign direct investment suggested that, the low and middle income countries are converging with each other more rapidly. This shows that chances of converging with high income countries remain steady in the presence of foreign direct investment.

Studies by Ebi and Okon (2019) and Effiom and Ebi (2016) had also pointed at FDI as an important determinant of performance and patterns of economic growth of four biggest economies in Africa: South Africa, Algeria, Nigeria, and Egypt (SANE) as well as determinant of growth in some states in Nigeria respectively.

3. Research Methodology

The study is rooted in neoclassical equilibrium theory and endogenous growth divergence theory. Whereas the neoclassical growth theory postulates that provided that there are no major barriers to operations of market processes, strong tendency exists for countries to converge to common steady state in the long run, the post neoclassical endogenous growth theory insists that there are inherent factors that makes for convergence of countries over time. Endogenous growth theory maintains that market forces are spatially disequilibrating and economies of scale (increasing returns) lead to cumulative concentration of capital, labour and output in certain regions at the expense of others; uneven development is self-reinforcing rather than self-correcting (Martin & Sunley 1996).

3.1 Model Specification

3.1.1 Johansen Cointegration Test.

The Johansen cointegration method is a system approach to cointegration and it is used when the variables are each integrated of order one. It allows for multiple cointegration relationship on the basis of which it is possible to determine if there is complete convergence or partial convergence or no convergence at all (divergence).

The Johansen multivariate tests of cointegration is specified as:

$$\Delta Y_t = \Pi_o + \Pi Y_{t-1} + \Pi_1 \Delta Y_{t-1} + \Pi_2 \Delta Y_{t-2} + \ldots + \Pi_p \Delta Y_{t-p} + v_{5t} \qquad (1)$$

Where Y_t = vector of a macroeconomic variable (for example per capita GDP), Π =matrix of coefficients.

According to Johansen (1988) if Y_t is a vector of all the variables, then the term containing the long-run parameters can be written as ΠY_{t-1}, where $\Pi = \alpha\beta$, α is the speed of adjustment vector, β is the vector of long run parameters. In equation 3.1 the main interest is the rank of Π, which is related to the number of cointegrating vectors. If the rank Π = n (the number of countries in the sample), then Y_t is a stationary process. If the rank Π is such that $0<r<n$, there are r cointegrating vectors for the individual series in Y_t and thus the group of countries is driven by (n-r) common shocks. If the rank Π =0, there are n stochastic trends and the

long run output levels are not related across countries, i.e there is no convergence.

The Johansen approach to cointegration was applied to determine the degree of nominal convergence (inflation and deficit/GDP ratio) in SADC. vidence of nominal convergence and macroeconomic convergence is indicative that the region is achieving the desired macroeconomic outcomes. The variables tested for nominal convergence in SADC include fiscal deficit/GDP ratio, nominal effective exchange rate, interest rate and consumer price index.

3.1.2 Stochastic Convergence

Stochastic convergence is based on the concept of unit roots and cointegration. If the output differences series is a mean zero stationary process, then there is stochastic convergence. Similarly, in order for countries i and j to converge, their outputs must be cointegrated with cointegrating vector [1, -1].

Let LY_{it} = log of per capita GDP of country i in time t and let LY_{0t} = log of per capita income of benchmark country for which all the other countries are converging to. Then $LY_{oit} = LY_{it} - LY_{0t}$ is the log difference of per capita GDP of country i and benchmark country 0.

The augmented Dickey Fuller (ADF) unit test for convergence is specified as:

$$\Delta LY_{0it} = \psi_0 + \psi_1 T + \psi_2 LY_{0it-1} + \sum \phi_i \Delta LY_{0it-i} + w_t \qquad (2)$$

Where Δ denote change, LY_{0it} = log difference of per capita GDP of a member country in SADC and per capita GDP of South Africa, T= time trend, Y_{oit-1} = one period (year lag) of per capita GDP, wt is the stochastic random term. The addition of the autoregressive components in the equation is the basis of the Augmented Dickey-Fuller unit test which ensures that the error term $\mathbf{w_t}$ is white noise.

Null hypothesis: $\psi_2 >= 1$ and not significant (there is no convergence, i.e divergence is the case)

Alternative hypothesis: $\psi_2 < 1$ and statistical significant (there is convergence, i.e countries exhibit catching-up).

3.2 Determinants of convergence

Where there is convergence we proceed to determine the role of technology transfer (FDI), fiscal deficit (FDY), inflation (INF), trade (OPEN) and growth in real GDP (G) in the convergence process. Our model is of the form:

$$CONV_t = f(FDI, FDY, INF, G, OPEN) \quad (3)$$

$$CONV_t = \Theta_0 + \Theta_1 FDI_t + \Theta_2 FDY_t + \Theta_3 INF_t + \Theta_4 G_t + \Theta_5 OPEN_t + v_{7t} \quad (4)$$

$$\Theta_1, \Theta_4, \Theta_5 < 0, \quad \Theta_2, \Theta_3 > 0$$

Where $CONV_t$ = deviation of per capita income of country i from South African per capita GDP, FDI=foreign direct investment, FDY=fiscal deficit as ratio of GDP, G= real GDP growth rate, INF=inflation rate, and OPEN = trade measured by (export + import)/GDP. Fiscal and monetary policies are brought into the equation because for the economies in a given economic integration area to deal with economic shocks effectively in a coordinated manner, their macroeconomic policies need to be harmonized.

As noted in Ndiaye and Korsu (2013), there has to be fiscal convergence otherwise sustaining economic integration would be difficult. In addition, there have to be convergence in inflation rate since low and stable inflation is the ultimate goal of monetary policy in an economic integration area.

3.3 Sources of Data

Annual data on inflation rate was obtained from World Bank World Development Indicators. Real GDP, Inflation, fiscal deficit, foreign direct investment, openness to trade and consumer price index were taken on an annual basis. Real GDP was obtained as GDP at constant 2010 prices. Budget deficit is measured as annual budget deficit as a percentage of GDP. Data were obtained from International Financial Statistics Year Book (various issues).

4. Results and Discussion Of Findings

The empirical results are presented in Tables 1 to 16 beginning with results on nominal convergence.

4.1 Result of Real Convergence in Per capita GDP

Table 1 below presents the results of unit root test based on augmented Dickey-Fuller (ADF). The test was carried out with trend and without trends and evaluated at 1 to 10% level of statistical significance. Stationary test was carried out to determine whether the variables are stationary or non-stationary to avoid having spurious regression results.

Table 1: ADF Unit Root Test of Convergence of SADC Countries

S/n	COUNTRY	LEVEL	1ST DIFFERENCE	ORDER OF INTEGRATION	DECISION
1	ANGOLA	-1.9455	-3.2433***	I(1)	Diverging
2	BOTSWANA	-1.8694	-8.7228*	I(1)	Diverging
3	CONGO DR	1.0041	-3.0819**	I(1)	Diverging
4	LESOTHO	-1.6272	-4.0774*	I(1)	Diverging
5	MADAGASCAR	-3.5784**	-	I(0)	Converging
6	MALAWI (with trend)	-2.7431	-3.8588*	I(1)	Diverging
7	MAURITIUS	-3.5057**	-	I(0)	Converging
8	MOZAMBIQUE	-3.3289***	-	I(0)	Converging
9	NAMIBIA	-4.9193*	-	1(0)	Converging
10	SEYCHELLES	-5.2707*	-	1(0)	Converging
11	SWAZILAND	-3.6602**	-	I(0)	Converging
12	TANZANIA	-3.7353**	-	I(0)	Converging
13	ZAMBIA	-3.7049**	-	I(0)	Converging
14	ZIMBABWE	-6.7016*	-	1(0)	Converging

Critical Values With Trend Trend

*1% → -4.2529

**5% → -3.5485

***10 → -3.2071

Critical Values Without

*1% → -3.6394

**5% → -2.9511

***10% → -2.6143

Also, the test was carried out to determine the possibility of a convergence of per capita income among the member states of SADC to the benchmark country (South-Africa) and the empirical results as presented in table 1 below show the t-values of countries, the corresponding decision of convergence or divergence.

From table1 above, a country in SADC is deem to converge to the bench-mark country per capita income (South Africa per capita income) when the GDP per capita data of the country is stationary. That is having 1(0) order of integration. For the data or series to be stationary, then its calculated t-statistics value must be negative and greater than the critical value at least 10% level of significance. Accordingly, the calculated t-values of Angola (-1.9455), Botswana (-1.8694), Lesotho (-1.6272) and Malawi (-2.7431) though negative are less than critical value at 10% (-3.2071) with trend as shown in table 1. The t-value of DR Congo shows a positive value of 1.0041 and is less than the critical value at 10% level of significance. This means that these countries per capita GDPs have unit root and are not stationary in relation to South Africa GDP per capita data. Hence their per capita GDP diverged from that of South Africa.

Fascinatingly, the result also shows that the t-values for Madagascar, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe were negative and greater than the critical values at one percent level. This implies that these counties per capita GDPs do not have unit root and are stationary in relation to South Africa GDP per capita data. Hence their per capita GDP converged to that of South Africa.

In summary, it is deduced that there are five (5) countries diverging from South-Africa (the benchmark country). This means that their per capita income gap to South Africa is going wider and it will be very difficult for these countries to catch up with the benchmark country. These five (5) countries are; Angola, Botswana, DR Congo, Lesotho and Malawi.

The result also shows that apart from the 5 countries showing divergence, the other nine (9) countries shows convergence towards South-Africa. This depicts that the gap between these nine (9) countries and South-Africa is reducing. Thus there is a better chance of these countries to catch up with South Africa or even overtake South Africa in

their per capita income in the nearest future. The converging countries are; Madagascar, Mauritius, Mozambique, Namibia, Seychelles, Swaziland, Tanzania, Zambia and Zimbabwe.

4.2 Results of Determinants of Convergence of Per Capita GDP in SADC

The idea of convergence is the hypothesis that poorer economies (countries) will tend to grow at a faster rate than richer economies. As a result, all economies in the SADC region should eventually converge in terms of per capita income in order to attain a faster growth, reduce income inequality and minimize the poverty gap between the countries in the region and the benchmark country (South Africa).

There must be some factors or conditions necessary for convergence to take place. These determinants (factors) help draw the income of each of the countries in the region to the benchmark country. Thus, from the econometric results of the parameter estimates for each of the countries in the SADC region, the following were observed as the key determinants of convergence in the countries in the SADC region; foreign direct investment (FDI), economic growth (G), openness to trade (OPEN), inflation (I) and fiscal deficit (FDY). Also, to determine the variables necessary for convergence in each of the countries in the region, the variables used in each of these countries must be statistically significant at less than 10 percent level. These will enable us to know the most important determinants (variables) that brings convergence in the country.

Table2: Angola Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.360439	0.017896	-20.14043	0.0000
FDY	0.000265	0.001135	0.233478	0.8170
FDI	-19772698	9789266.	-2.019835	0.0527
INF	-2.93E-05	1.06E-05	-2.756111	0.0100
G	-0.000422	0.001654	-0.255310	0.8003
G(-1)	0.003182	0.001641	1.939072	0.0623
Adjusted R-squared- 0.364883, F-statistic- 4.906686, Durbin-Watson stat- 1.852597				

From the results presented in the table 2, foreign direct investment (FDI), Inflation (INF) and economic growth (G), are the key drivers of convergence in Angola. The variables were statistically significant at less than 10 percent level. Whereas foreign direct investment (FDI) has a negative sign implying that increased inflow of foreign direct investment (FDI) will help to reduce the income gap between South-Africa and Angola. The positive sign for economic growth (G) and negative sign for inflation (INF) are inconsistent with economic theory. A fast economic growth should promote convergence or catch-up with South-Africa, not divergence.

Table 3: Botswana Parameter Estimates for drivers of Convergence

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.076408	0.027016	-2.828302	0.0083
FDY	-0.006408	0.002068	-3.098367	0.0042
FDI	-54813997	8447848.	-6.488516	0.0000
INF(-1)	0.002604	0.002199	1.184383	0.2456
G	-0.005079	0.002927	-1.735314	0.0929
Adjusted R-squared- 0.779458, F-statistic- 31.04144, Durbin-Watson stat- 1.976505				

The results in table 3 above for Botswana are interesting in that, most of the variables bear signs that are consistent with economic theory. These variables are statistically significant at less than 10 percent level. Fiscal deficit (FDY), foreign direct investment (FDI) and economic growth (G) have the potential to reduce the income gap between Botswana and South-Africa. They are all significant and bear negative signs. For instance, rapid economic growth (G) in Botswana will promote catch-up with South-Africa. Its population growth is less than the growth rate of real GDP.

Table 4: DR Congo Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.637349	0.090290	-18.13433	0.0000
OP	-913250.3	189543.4	-4.818158	0.0000
INF(-1)	2.90E-05	2.41E-05	1.202215	0.2390
FDI	-2.79E+08	1.33E+08	-2.099881	0.0446
FDY	-0.011602	0.005467	-2.122231	0.0425
G	-0.000688	0.006308	-0.109021	0.9139
Adjusted R-squared- 0.679734, F-statistic- 15.43237, Durbin-Watson stat- 1.733043				

It can be deduced from the results in table 4 for Dr. Congo that fiscal deficit (FDY), foreign direct investment (FDI) and openness (OPEN) are the key drivers of convergence in DR Congo. These variables were statistically significant at less than 5 percent level and the all beer negative signs. The negative signs of foreign direct investment (FDI) means that an increase in the inflow of foreign direct investment into Dr. Congo will help reduce the income gap between DR Congo and South-Africa. The fiscal deficit (FDY) also shows negative, which depicts that a decrease in DR Congo's fiscal deficit (FDY) will draw the income of DR Congo closer to the benchmark country (South-Africa).

Table 5: Lesotho Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.81572	0.19785	-4.12296	0.0003
INF	-0.00399	0.00196	2.03901	0.0507
FDI(-1)	-164165.	629097.	2.66771	0.0321
FDY	-0.00490	0.00214	2.29247	0.0293
OP	-155692	153543	-1.01400	0.3190
G(-1)	0.010595	0.006448	1.64321	0.1111
Adjusted R-squared- 0.676032, F-statistic- 6.592678, Durbin-Watson stat- 1.820415				

The results in table 5 for Lesotho shows that fiscal deficit (FDY), foreign direct investment (FDI) and inflation (INF) are the key drivers of convergence in Lesotho, they have the capacity to draw Lesotho closer to South-Africa. These variables are statistically significant at less than 10 percent level and they are all statistically significant and with negative signs. For example, a reduction in the inflation (INF) rate and fiscal deficit (FDY) in Lesotho will draw the income of Lesotho closer to catch up with the income of South-Africa.

Table 6: Madagascar Parameter Estimates for drivers of Convergence

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-1.047452	0.020808	-50.33778	0.0000
OP	-435738.1	64845.63	-6.719622	0.0000
FDI	45671936	23022786	1.983771	0.0572
FDI(-1)	-61638752	21290069	-2.895188	0.0073
FDY(-1)	-0.002489	0.001793	-1.38827	0.1760
G(-1)	-0.00219	0.00128	-1.71057	0.0982
INF	-0.001691	0.000642	-2.634803	0.0136
Adjusted R-squared- 0.755556, F-statistic- 18.51517, Durbin-Watson stat- 1.838626				

From the econometric results indicated in table 6 above, foreign direct investment (FDI), economic growth (G), openness (OPEN) and inflation (INF) are the key drivers of convergence. The result is interesting and different from Angola, Botswana, DR Congo and Lesotho in that, the econometric result of Madagascar shows a convergence towards South-Africa. The key drivers of convergence in Madagascar (FDI, G, OPEN and INF) are the variables responsible for the income of Madagascar to converge with that of South-Africa and they are statistically significant at less than 10 percent level. The negative sing of foreign direct investment (FDI) implies that an increase in the flow of foreign direct investment into Madagascar will help the country's income to catch up with that of South-Africa at a faster rate and possible overtake it.

Table 7: Malawi Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.298899	0.033225	-39.09450	0.0000
OP	-111003.9	58293.54	1.904224	0.0668
FDY(-1)	-0.002679	0.001216	2.365978	0.0301
FDI(-1)	-9935602.	1020384	9.915390	0.0000
G	-0.002348	0.001046	2.244176	0.0326
INF	-0.000453	0.000252	1.798329	0.0825
Adjusted R-squared- 0.748813, F-statistic- 7.252343, Durbin-Watson stat- 1.849043				

The results in table 7 are interesting in that all the variables of Malawi are key drivers of convergence in Malawi. They variables are fiscal deficit (FIS), foreign direct investment (FDI), economic growth (G), inflation (INF) and openness (OPEN). These variables are statistically significant at less than 10 percent level and beer negative signs. These variables are consistent with the economic theory and have the potential to reduce the per capita income gap between Malawi and South-Africa. For instance, an increase in the flow of foreign direct investment (FDI) into Malawi and a rapid economic growth (G) will push the income of Malawi closer to South-Africa. Also, the negative signs in Inflation (INF) and Fiscal deficit (FDY) shows that a reduction in inflation rate and a decrease in the fiscal deficit will draw the income of Malawi closer to the benchmark country.

Table 8: Mauritius Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.221793	0.204846	1.082731	0.2876
OP	-472033.4	194961.9	-2.421157	0.0217
INF	0.015965	0.005419	2.946121	0.0062
G	-0.001864	0.000831	-2.240260	0.0282
FDI	-24773200	10361169	-2.235348	0.0266
FDY	0.021241	0.013579	1.564256	0.1282
Adjusted R-squared- 0.644597, F-statistic- 6.634742, Durbin-Watson stat- 1.703425				

In the case of Mauritius, the result in Table8 shows that foreign direct investment (FDI), economic growth (G), openness (OPEN) and inflation

(INF) are the key drivers of convergence in Mauritius. These variables are statistically significant at less than 5 percent level. For example, rapid economic growth in Mauritius will cause the income of Mauritius to catch- up with South-Africa's income and if possible overtake it overtime.

Table 9: Mozambique Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.676939	0.046724	-35.89033	0.0000
OP	-328686.0	93410.57	-3.518724	0.0014
INF	-0.001257	0.000404	-3.108070	0.0041
FDI	-82855919	26906962	-3.079349	0.0044
G	-0.003781	0.001965	-1.924587	0.0638
FDY	-0.002184	0.004365	-0.500403	0.6204
Adjusted R-squared- 0.800684, F-statistic- 29.12011, Durbin-Watson stat- 1.818997				

The result of Mozambique in table 9 indicates that the variables responsible for convergence are the same with that of Mauritius. These variables - foreign direct investment (FDI), economic growth (G), inflation (INF) and openness (OPEN) are statistically significant at less than 10 percent level and beer negative signs and are the key variables of convergence in Mozambique. The result shows that an increase in the flow of foreign direct investment (FDI) into Mozambique and a decrease in the rate of inflation in Mozambique will help reduce the income gap between Mozambique and South-Africa.

Table 10: Namibia Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.345821	0.043871	-7.882653	0.0000
OP	-118201.5	47145.30	-2.507174	0.0178
G	-0.005737	0.001761	-3.257158	0.0028
FDI	-934683.4	4129835.	-2.496064	0.0181
INF	-0.002306	0.000951	-2.424492	0.0216
FDY	-0.003558	0.001585	-2.244531	0.0323
Adjusted R-squared- 0.841069, F-statistic- 10.878388, Durbin-Watson stat- 1.748818				

The results of Namibia in table 10 are similar to those of Malawian case in that all its variables are key drivers of convergence. The results are however different from those of Mozambique and Mauritius given the differences in their economic performance. The key variables include fiscal deficit (FDY), foreign direct investment (FDI), economic growth (G) and openness (OPEN). These variables are all negative and significant at less than 5 percent level. They are also consistent with economic theory. They are the main drivers of income convergence between Namibia and South-Africa.

Table 11: Seychelles Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.044670	0.041902	-1.066056	0.2952
OP	-111165.1	37019.95	-3.002843	0.0055
FDI	-5735842.	833688.6	-6.880078	0.0000
INF	0.689984	0.587089	1.175263	0.2494
FDY	-0.003122	0.001452	-2.150879	0.0400
G(-1)	0.002165	0.001948	1.111316	0.2756
Adjusted R-squared 0.692300, F-statistic 16.29942, Durbin-Watson stat 1.753928				

From the results of Seychelles presented in table 11, we found that FDY, FDI & OPEN are the Key drivers of convergence in Seychelles. These variables were statistically significant at less than 5 percent level. The negative signs of the variables indicate that an increase in the flow of foreign direct investment (FDI), an increase in the level of openness and a decrease in the fiscal deficit (FDY) in Seychelles will reduce the income gap between Seychelles and South-Africa.

Table 12: Swaziland Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.206219	0.074306	-2.775262	0.0094
INF	0.000390	0.001807	0.215649	0.8307
FDI	-4870319.	2426845.	-2.052622	0.0309
OP	-170430.8	66619.25	-2.558282	0.0158
G	-0.002129	0.001298	-1.860525	0.0793
FDY	0.000770	0.004551	0.169205	0.8668
Adjusted R-squared- 0.652294, F-statistic- 5.807376, Durbin-Watson stat- 1.837362				

The results of Swaziland presented in table 12, show that FDI, OPEN and G are they key drivers of convergence. These variables are responsible for the convergence of Swaziland's income to that of the benchmark country (South-Africa). They are all negative and significant at less than 10 percent level. An increase in the level of openness promotes trade between Swaziland and South Africa and with other countries while rapid economic growth in Swaziland may lead to the convergence of the income of Swaziland and South-Africa.

Table 13: Tanzania Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.221288	0.046341	-26.35412	0.0000
OP	-172621.4	87044.01	-1.983150	0.0566
G	-0.007229	0.003553	2.301895	0.0459
INF	-0.003792	0.001471	2.577981	0.0151
FDI	-33985727	15361123	-2.202999	0.0551
FDY	0.003774	0.005477	0.689115	0.4960
Adjusted R-squared- 0.645569, F-statistic- 6.860363, Durbin-Watson stat- 1.741062				

Table 13 highlight Tanzania's result. It is deduced from the results that foreign direct investment (FDI), economic growth (G), inflation (INF) and openness (OPEN) are the major drivers of convergence in Tanzania. They are statistically significant at less than 10 percent level and with negative signs. An increase in the openness encourages trade between Tanzania and other countries. This increases the income of Tanzania and reduces the income gap with the benchmark country. Also, a rapid economic growth (G) in Tanzania will promote catch-up with South-Africa given that its population growth is less than its growth rate of real GDP.

Table 14: Zambia Parameter Estimates for drivers of Convergence

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.521516	0.086343	-6.040067	0.0000
OP	-555562.1	147393.0	-3.769256	0.0007
G	-0.013652	0.003861	-3.535959	0.0013
INF	-0.000721	0.000389	-1.852838	0.0738
FDI	-1.08E+08	21405115	-5.054282	0.0000
FDY	-0.002876	0.002272	-1.265975	0.2153
Adjusted R-squared- 0.686285, F-statistic- 16.31322, Durbin-Watson stat- 2.149647				

The result for Zambia in table 14 above is the same with that of Tanzania in that it shows that the same drivers of convergence as that of Tanzania. These variables (FDI, G, INF and OPEN) are negative and statistically significant at less than 10 percent level. An increase in the flow of FDI into Zambia will help minimize the income gap between Zambia and South-Africa.

Table 15: Zimbabwe Parameter Estimates for drivers of Convergence

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.740085	0.028353	-26.10222	0.0000
OP(-1)	11163.27	42478.44	0.262799	0.7946
G	-0.002254	0.000887	2.539579	0.0167
INF	-0.000469	0.000141	-3.814002	0.0007
FDI(-1)	-22333512	39421732	-0.566528	0.5754
FDY(-1)	0.005890	0.001688	3.488702	0.0016
Adjusted R-squared- 0.594778, F-statistic- 5.842350, Durbin-Watson stat- 1.786726				

The result of Zimbabwe is different from other member countries in that Foreign Direct Investment in Zimbabwe (FDI) is not a key indicator of convergence. The key drivers of convergence in Zimbabwe include: growth in Zimbabwe (G), Inflation in Zimbabwe (INF) and Fiscal Deficit in Zimbabwe (FDY). These variables are statistically significant at better than 5 percent level and help to promote the income convergence of Zimbabwe to South-Africa's income.

Table 16: Summary of Key Determinants of Convergence in SADC Countries

C/N	Country	Fiscal Deficit	Foreign Direct Investment	Growth in GDP	Openness	Inflation
1	Angola		•	•		•
2	Botswana	•	•	•		
3	DR Congo	•	•		•	
4	Lesotho	•	•		•	
5	Madagascar		•	•	•	•
6	Malawi		•	•	•	•
7	Mauritius		•	•	•	•
8	Mozambique		•	•	•	•
9	Namibia	•	•	•	•	•
10	Seychelles	•	•		•	
11	Swaziland		•	•	•	
12	Tanzania		•	•	•	•
13	Zambia		•	•	•	•
14	Zimbabwe	•		•		•

Note: • Denotes significant / determinant.

In conclusion, from Table 16 presented above, it is obvious that foreign direct investment (FDI) plays a major role in the convergence of per capita income in SADC. This is because it is a key determinant of convergence in all but one country (Zimbabwe) in the region. This is followed by economic growth (G) which is also a key determinant of convergence in eleven (11) out of fourteen (14) countries in the region. These principal determinants help to reduce the income gap between the member countries and South-Africa. They are indeed the promoters of convergence (catch-up) of member countries to South-Africa.

5. Conclusion

In this study, we made contribution to the existing literature by evaluating convergence of per capita income in the southern African development community (SADC). We explained the criteria necessary for convergence of per capita income in the SADC region. The neoclassical growth theory constituted the theoretical anchor of the study. It predicts that economic integration among national and regional economies would inevitably result in per capita income convergence. This will further lead to more capital accumulation and faster economic growth in poor countries (regions) than in rich ones, resulting in

economic convergence towards a common level of per capita income in the long run.

We adopted the unit root tests and cointegration methodology to determine the existence of convergence. The results of the study are revealing. We showed that although there was wide disparity of income of SADC member state in the 1992, there has been a tendency towards convergence in real per capita income of 9 out of 15 countries in the SADC region. This finding, although aligned with Artelaris et al. (2011), Gilles et al. (2010) and others that, convergence and divergence co-exist but lend credence to more convergence in per capita income in SADC. The finding disagrees with the finding of McCoskey (2002) and Wolassa (2011). Specifically, Wolassa (2011) had investigated convergence in real per capita GDP, macroeconomic policy and stability indicators within the SADC using the ADF unit root test, for the period of 1992-2009. The results showed no evidence of absolute beta and sigma convergence in real per capita GDP among the SADC economies except in Botswana and South Africa's real per capita GDP while the rest of the countries were characterized by a boundless drift. It is important to note that, Wolassa (2011) study is about eleven (11) years now and many developments have taken place in the SADC region. Again, the small sample size (17 years) employed then may have minimized the possibility of more convergence among the SADC countries. Hence, the finding of this present study proficiently updates Wolassa (2011) study with more (9 out of 14 countries or about 64%) evidence of per capita income convergence in SADC.

The study also identified drivers of convergence of per capita income in the SADC region. These include: foreign direct investment as the main driver and followed by economic Growth, inflation, openness to trade and fiscal deficit/GDP. This finding aligned strongly with the findings of Zhang (2001), Jawaid and Raza (2012) Wahiba (2015), Azam ((2016) and Ebi and Okon (2019) that increase in FDI and trade openness, tend to accelerate the economic growth and convergence process. Hence, we conclude that, growth convergence is eminent in SADC. Increase in FDI, low fiscal deficit and a stable inflation rate should be pursued to guarantee macroeconomic stability in order to sustain convergence.

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Debt-Growth Nexus in Jordan: New Evidence Using Dynamic Threshold Analysis

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ABSTRACT

This paper examines the government debt and economic growth nexus in Jordan from 1990 to 2017 by estimating the debt-growth threshold, using the time series dynamic threshold estimation technique. The empirical results reveal that a threshold effect exists in the gross government debt and economic growth relationship. More precisely, the findings demonstrate that the explanatory variables respond differently under the upper and lower regimes to attain economic growth in Jordan, indicating that the relationship between gross government debt and economic growth is contingent on the debt-to-GDP ratio. Importantly, policymakers should reduce the debt-to-GDP ratio through efficient allocation of financial sources by reducing government-funded programs to attain a higher growth rate and curb the effects of shocks such as the financial crisis.

ملخص

يبحث هذا المقال في العلاقة بين الديْن الحكومي والنمو الاقتصادي في الأردن في الفترة ما بين عامي 1990 و 2017 من خلال تقدير عتبة نمو الديْن، باستخدام تقنية التنبؤ بالعتبات الديناميكية للسلاسل الزمنية. وتكشف النتائج التجريبية عن وجود تأثير عتبة معينة في العلاقة بين إجمالي الديْن الحكومي والنمو الاقتصادي. وبتعبير أدق، توضح النتائج أن المتغيرات التفسيرية تستجيب بشكل مختلف في ظل النظامين الأعلى والأدنى لتحقيق النمو الاقتصادي في الأردن، مما يشير إلى أن العلاقة بين إجمالي الديْن الحكومي والنمو الاقتصادي تتوقف على نسبة الديْن إلى الناتج المحلي

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الإجمالي. والأهم من ذلك، يجب على صناع السياسات خفض نسبة الدين إلى الناتج المحلي الإجمالي من خلال التخصيص الفعال للمصادر المالية عن طريق تقليل البرامج التي تمولها الحكومة لتحقيق معدل نمو أعلى والحد من آثار الصدمات مثل الأزمة المالية. الكلمات الدلالية: الدين الحكومي؛ النمو الاقتصادي؛ تأثيرات العتبة؛ الأردن.

Cet article examine le lien entre la dette publique et la croissance économique en Jordanie de 1990 à 2017 en estimant le seuil de croissance de la dette, en utilisant la technique d'estimation du seuil dynamique des séries chronologiques. Les résultats empiriques révèlent qu'il existe un effet de seuil dans la relation entre la dette publique brute et la croissance économique. Plus précisément, les résultats montrent que les variables explicatives réagissent différemment sous les régimes supérieur et inférieur pour atteindre la croissance économique en Jordanie, ce qui indique que la relation entre la dette publique brute et la croissance économique dépend du ratio de la dette au PIB. Il est important que les décideurs politiques réduisent le ratio de la dette au PIB par une allocation efficace des sources financières en réduisant les programmes financés par le gouvernement pour atteindre un taux de croissance plus élevé et freiner les effets de chocs tels que la crise financière.

Keywords: Government Debt; Economic Growth; Threshold Effects; Jordan.

JEL Classification: E62; H63; N15; C24

1. Introduction

Government debt accumulation is considered one of the most critical economic issues in Jordan. The long-term effects of government debt accumulation on economic growth have started to impose even greater pressure on Jordan policymakers to sustain economic growth and curb the chronic budget deficit's adverse effects on economic growth. Budget deficits have considered an essential issue in government finance choices when taking the level of economic growth into account (Raji et al., 2014). After the last financial crisis, many countries directed substantial attention toward their governments' debt, which led to an increased number of studies conducted to estimate the relationship

between government debt and economic growth (Tuffour, 2012; Zouhaier and Fatma, 2014; Al-Zeaud, 2014; Akram, 2015; Spilioti and Vamvoukas, 2015; Fincke and Greiner 2015; Muye et al., 2017; Elghouty 2018; Al-Tamimi and Jaradat 2019; Chkiriba and Oumansour 2019).

Theoretically, a shortage of collectible government revenue or government spending expansion requires the government to borrow from different sources to finance budget deficits. However, the adverse effects of budget deficits may weaken development strategies because of limited financial sources. Consequently, such circumstances may deter the overall economic growth of a country. However, policymakers are obligated to counteract these negative effects by expanding the country's infrastructure by building sanitation facilities, roads, hospitals, schools, and other items with modest collectible government revenues. An easy strategy to finance these expansion projects is borrowing from internal and external resources such as the World Bank (WB) and the International Money Fund (IMF). However, borrowing from either of these sources negatively affects economic growth as external debt has a currency risk because it tends to cause an appreciation of the exchange rate. On the other hand, internal debt has an interest rate risk. As the ability of any country to borrow is growing over time, especially countries categorized as low-income countries and those with a low level of debt, government debt may potentially encumber the long-term budget balance. Therefore, evaluating government debt accumulation and economic growth nexus is essential to establish an effective policy.

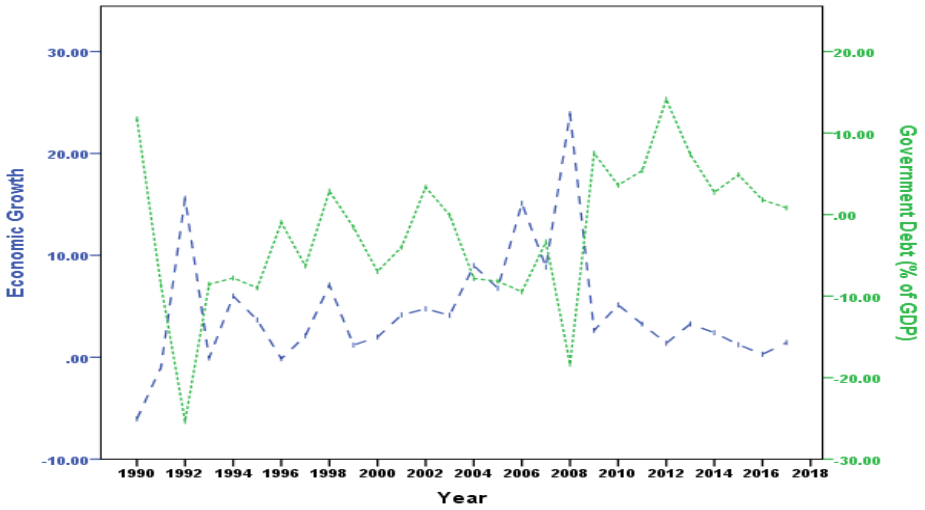
As a small open economy, Jordan began reforming its financial sector in the late 1980s with the aid of the structural adjustment programs (SAPs) adopted in Jordan under the IMF and the WB support. The main goal of SAPs is to promote long-term economic growth in developing economies by controlling borrowing based on a country's budget imbalances in both the short- and medium-term. Such reforms boosted economic growth in Jordan throughout the 1990s. Nonetheless, Jordan's economic growth rate has underperformed and fluctuated compared to those in other developing countries. The global financial crisis in 2007-2008 significantly affected Jordan because of the country's high interdependence with the U.S. in terms of financial assistance, which put

pressure on the Jordanian economy due to the loss of financial aid[5]. As a developing country, Jordan's debt-to-gross domestic product (GDP) ratio is high and concerning compared to those in other developing countries such as Morocco and Tunisia**.** Over the last decades, the average debt-to-GDP ratio has been approximately 79.01% in Jordan, 23% higher than that in Morocco and 30% higher than that in Tunisia. A widespread view among researchers studying debt accumulation effects on economic growth in Jordan is that broad government interventions, the low quality of fiscal policies adopted by the government, such as expansion of government spending compared to that in other developing countries, and limited natural resources are the main reasons for government debt accumulation in Jordan.

Jordan has experienced vast development of its infrastructure, including roads, schools, hospitals, and sanitation facilities, which has been linked to expansion of government spending. Consequently, government spending expansion has resulted in debt accumulation. Figure 1 shows the overall picture in Jordan: a non-linear relationship between economic growth and government debt. The government debt has reached approximately 103.7% of the GDP on average over the last three decades. Throughout 1990-1999, the trend for gross government debt as a percentage of the GDP fluctuated, with no clear pattern or responsiveness to economic growth changes. During the financial crisis, government debt growth decreased by approximately 18% of the GDP on average, which resulted in a sharp increase in the GDP per capita growth rate to approximately 23%. Interestingly, a decrease in debt accumulation sometimes leads to economic growth acceleration, as observed between 1992 and 2006. Overall, the relationship between gross government debt and economic growth is non-linear. Reinhart and Rogoff (2010) indicated that both developed and developing countries are highly concerned with their levels of debt and suggested that government debt as a percentage of the GDP should not exceed 60% in developing countries aiming to achieve greater economic growth; exceeding this threshold will increase the financial burden on these countries because of debt repayment requirements, which tend to slow economic growth.

[5] In 1961, congress passed the Foreign Assistance Act, reorganizing U.S. foreign assistance programs and separating military and non-military aid. Egypt, Jordan, Iraq, Israel and Lebanon are among the recipient countries in MENA.

Figure 1: The Trend of the Government Debt and Economic Growth in Jordan (Annual Growth).



Source: World Development Indicators (WDI) database.

These data regarding gross government debt and economic growth raise concerns about the debt-to-GDP threshold, sustaining economic growth in Jordan. It is also relevant to ask, what is the optimum level of government debt that can maintain economic growth in Jordan over the period from 1990 to 2017? Thus, this paper aimed to address this issue. Given this backdrop, this paper contributes to the existing literature in two aspects. First, in terms of the policy, this paper can directly help fiscal policymakers in Jordan. Overall, no fixed threshold exists for the debt-to-GDP ratio in Jordan, dependent on the budget balance. Jordan is vulnerable to many crucial economic shocks. Therefore, identifying the debt-to-GDP threshold level can minimize the adverse effects of over-borrowing in Jordan by providing signals for policymakers to manage debt accumulation. Second, the present paper is novel because it adopts the regression model proposed by Hansen (2000) to capture the dynamics between the debt-to-GDP threshold and economic growth and determine a reliable optimum debt-to-GDP threshold. The optimum gross government debt-to-GDP level for Jordan has not previously been addressed to the best of our knowledge. Moreover, this paper also provides insight into other explanatory variables and investigates their impact on economic growth in Jordan.

This paper is prepared as follows. Sections 2 reviews the literature on government debt and economic growth relationship. Section 3 discusses the methodology and describes the data. Section 4 is devoted to discussing the empirical results. Finally, the last section presents a summary of the findings and conclusions.

2. Literature Review

New classical economists argue that budget deficits require a government to borrow from internal and external resources to finance the deficits. Accordingly, external debt will deter economic growth by crowding out the investment sector. On the other hand, Keynes argues that fiscal policy is responsible for growth in any economy, where foreign assistance or investment tends to boost growth. Finally, the Ricardian equivalence hypothesis indicates that government debt has no real effect on economic growth because when a government borrows money, it must repay the borrowed funds in the future by raising taxes above the normal level; thus, the impact of debt accumulation on growth will be neutralized (Ricardo, 1817).

Several empirical macroeconomic studies have provided inconsistent or even contradictory results regarding the relationship between government debt and economic growth in developed and developing countries. However, most of the recent macroeconomic studies on the government debt and economic growth nexus have confirmed that both variables are linked non-linearly, where the effect of government debt on economic growth may differ up to a certain level of debt (See Pattillo et al., 2003; Kumar and Woo, 2010 and Cordella et al., 2010). Thus, a level of secured debt that can engender higher economic growth should exist. Therefore, if a country borrows without any limit, then economic growth will decline as the debt exceeds the certain limit known as the Laffer curve, as shown in Figure 2.

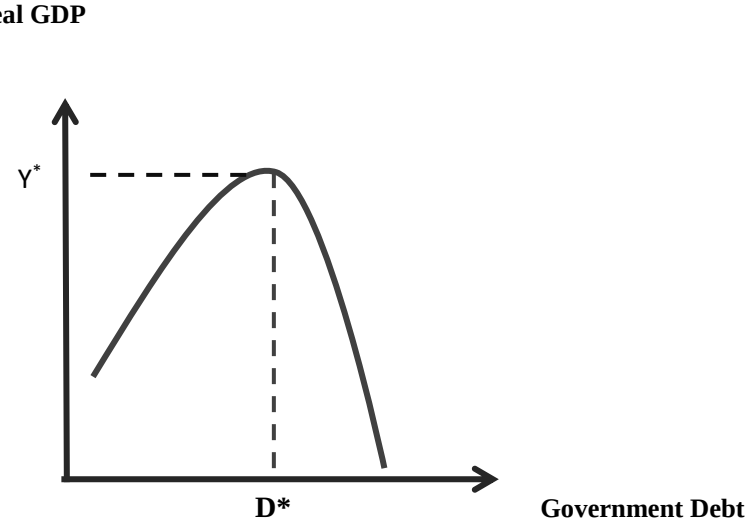


Figure 2: Laffer curve.

As shown in Figure 2, government debt (D) will increase growth (Y) to a certain point at which the economic growth score is maximal (Y*). Therefore, at the top economic growth curve, government debt's marginal productivity is equal to private-sector debt's marginal productivity. The economic contribution of increased government debt will be equal to zero. After the top point (D*), the effect of the law of diminishing returns will lead to a situation in which increasing government debt accumulation any further will slow down the economic growth rate. Consequently, reducing debt accumulation will be critical to attaining a higher rate of economic growth.

Many studies have examined the relationship between government debt and economic growth. For example, Mousa and Shawawreh (2017) examined the relationship between gross government debt and Jordan's economic growth from 2000 to 2015. The scholars used the least squares method in their analysis and found that government debt harms Jordan's economic growth, especially external debt. Similarly, Al-Tamimi and Jaradat (2019) maintained that external debt was negatively linked to Jordan's economic growth. Moreover, Abu-Karaki et al. (2016) examined the effect of domestic debt on economic growth from 2000 to 2014 in Jordan using the ordinary least square (OLS) technique. They contended that Jordan's economic growth arose from domestic debt stock, and that domestic debt servicing has a real negative effect on economic growth.

In Egypt, Elmahdy and Torayeh (2009) evaluated the government debt and economic growth relationship throughout 1981-2006 using the Error Correction Model (ECM). They hold that government debt tends to decrease economic growth. Likewise, Chkiriba and Oumansour (2019) examined the effect of external debt on Morocco's economic growth from 1988 to 2016 using auto regressive distributed lags (ARDL). The scholars defended that external debt has a strong negative association with economic growth. For Nigeria, Egbetunde (2012) used a vector autoregressive (VAR) to examine the causal relationship between government debt and economic growth from 1970 to 2010. The estimated results revealed a bi-directional causality relationship between government debt and economic growth. Furthermore, Spilioti and Vamvoukas (2015) examined the relationship between government debt and per capita growth over the Greek economy's 1970-2009 period. The results concluded that there is a statistically significant positive correlation between government debt and economic growth.

Another study by Nantwi and Erickson (2016) used Johansen cointegration and the vector error correction model (VECM) to empirically evaluate the causal relationship between government debt and economic growth in Ghana from 1970 to 2012. The results revealed a positive and statistically significant long-term nexus between government debt and economic growth. Additionally, a bidirectional Granger causality relationship was found between government debt and economic growth in the short-term. In Saudi Arabia, Muye et al. (2017) evaluated the effect of government debt on economic growth from 1969 to 2013 using the ARDL approach. The findings revealed that economic growth arises from government debt. Bal and Rath (2014) examined the effect of government debt on economic growth in India from 1980 to 2011 using the ARDL approach and emphasized that government debt has a significant negative impact on economic growth in India. Furthermore, in the study of five major South Asian economies, Shastri and Mohapatra (2018) used panel ARDL estimator to confirm that there is a positive long-run relationship between fiscal balances to the increasing public debt ratio, which indicate that public debt is an important variable in affecting economic growth of these economies.

Interestingly, some studied have examined the threshold value of the debt-to-GDP ratio, which can maintain economic growth, rather than investigating the effect of government debt on economic growth. For

example, Maghyereh et al. (2002) estimated the external debt and economic growth relationship in Jordan from 1970 to 2000 using the OLS method. The results revealed that the external debt-to-GDP ratio was 53%, and above this value, external debt would negatively affect economic growth. Moreover, Tuffour (2012) evaluated the external debt and economic growth relationship in Ghana from 1970 to 2009 using the least square (LS) method. The results showed that the external debt-to-GDP threshold was 46.2%, which could maintain economic growth, and that exceeding this threshold would deter economic growth. Nasa (2009) examined the threshold value for debt that could maintain growth in 56 countries of heavily indebted countries with low to medium income from 1970 to 2000 by utilizing the Hansen threshold model. The findings revealed that the debt-to-GDP threshold value that could maintain economic growth was 45%, and that exceeding this threshold value would slow economic growth.

Similarly, Kumar and Woo (2010) evaluated the relationship between government debt and economic growth in 38 developed and developing countries from 1970 to 2007. Empirical results from the analysis indicated an inverse relationship between initial debt levels and subsequent growth. The results emphasized that a 10% increase in the debt-to-GDP ratio would reduce the real per capita GDP by 0.2%. Moreover, Reinhart and Rogoff (2010) estimated the relationship between government debt and economic growth in 44 developed and developing countries using data from approximately 2 centuries. The scholars specified that exceeding a 90% debt-to-GDP ratio could dampen economic growth in advanced and emerging market economies. In comparison, a debt-to-GDP ratio of 60% was required for developing countries. Cordella et al. (2010) showed that debt overhang occurs when the current net value of debt exceeds 20% to 25% of the GDP in countries with good policies and institutions. On the other hand, government debt has only a marginal effect on economic growth at approximately 70% to 80% of the GDP. Besides, overhang and irrelevance thresholds level of debt-to- GDP ratio were lower (10% to 15% and 15% to 35%, respectively) for countries with low-quality policies and institutions.

For the Nigerian economy, Ezezbalisi et al. (2011) found a negative relationship between external debt and economic growth. The results emphasized that a 1% increase in external debt stock tends to slow

economic growth by 0.027% of the GDP. Herndon and Pollin (2013) reexamined the results of Reinhart and Rogoff (2010) and concluded that coding errors, selective exclusion of available data, and unconventional weighting of summary statistics led to errors that inaccurately represented the relationship between government debt and GDP growth among 20 advanced economies. The authors showed that the average real GDP growth rate for countries carrying a government debt-to-GDP ratio greater than 90% was actually 2.2% rather than 0.1% as reported by Reinhart and Rogoff, indicating that the average GDP growth with a government debt-to-GDP threshold above 90% is not significantly different from that with a lower government debt-to-GDP threshold. Moreover, Wright and Grenade (2014) revealed a non-linear relationship between debt and growth using a panel OLS method and threshold dynamics in 13 Caribbean countries. The results indicated that the debt-to-GDP threshold was 61%. Furthermore, economic growth reacts negatively when the debt-to-GDP threshold is exceeded.

Based on the above backdrop, there is no fixed debt-to-GDP threshold for the developing countries. Therefore, to avoid conjecture, it is necessary to estimate the debt-to-GDP threshold value for Jordan, because it has different income levels and the development stage.

3. Data and Methodology

3.1 Model Specification

To empirically estimate the gross government debt and economic growth nexus, this paper follows Clements et al. (2003), Cordella et al. (2005), and Caner et al. (2010). The empirical economic growth model is expressed as in the following regression:

$$rgdpc_t = \delta rgdpc_{t-1} + \beta_1 Capital_t + \beta_2 GEX_t + \beta_3 Open_t + \beta_4 Debt_t + \beta_4 Inf_t + e_t \quad (1)$$

where $rgdpc_t$ is the real GDP per capita used to measure economic growth, the control variables are capital ($Capital_t$) is the physical capital,, government expenditure (GEX_t) reflects a government policy, trade openness ($Open_t$) measures the economic independence, Debt ($Debt_t$) is government debt serves as a control variable in estimating the effect of government debt on economic growth as in Mankiw et al. (1992), and inflation rate (Inf_t) is a proxy for macroeconomic stability.

Finally, $rgdpc_{t-1}$ is included as a control variable to capture the dynamic effects of the model with one lag.

3.2 Data and Variable Descriptions

This paper utilizes time-series data reflecting annual frequencies from 1990 to 2017. The real gross domestic product per capita is expressed in U.S. dollars as a measurement for economic growth. Meanwhile, for explanatory variables, total investment as a percentage of GDP is used as a proxy for physical capital (*K*), government expenditure (*GEX*) is the total government expenditure as a percentage of GDP, government Debt (*Debt*) is the total debt as a percentage of the GDP, trade openness (*Open*) is the sum of exports plus imports as a percentage of the GDP, and inflation rate (*Inf*) is the annual percentages of average consumer prices. All variables are transformed into natural logarithms to reduce variations in the variables except inflation rate variable. All the data were obtained from the World Development Indicators (WDI) database.

3.3 Methodology Selection

The threshold model is considered an essential model for estimating many economic issues, and more recently, the threshold model has been exceedingly utilized in many macroeconomic studies (Lee and Wang, 2015). Consequently, to estimate the non-linear behavior of the debt-to-GDP ratio in its relationship with economic growth, this paper employs the threshold regression approach suggested by Hansen (2000). The model in Equation (1) can be written based on threshold regression as follows:

$$rgdpc_t = \mu_i + \beta_1 X_t I(Debt_t \leq \lambda) + \beta_2 X_t I(Debt_t \geq \lambda) + e_t \qquad (2)$$

where $rgdpc_t$ is the log of the real gross domestic product per capita as a proxy for economic growth, $X_{,t}$ is a vector of the control variables (physical capital, government expenditure, trade openness and inflation rate), $Debt_t$ is a threshold variable that divides the sample into upper and lower regimes, λ is an unknown threshold parameter, I(.) is an indicator function that takes a value of 1 if the argument in the indicator function is valid and 0 otherwise, μ_i is the individual effect, and e_t represents disturbance. Equation (2) can be rewritten as two equations, where the

first equation describes the lower regime threshold and the second equation represents the upper regime threshold:

$$rgdpc_t = \mu_i + \beta_1 X_t\, I(Debt_t \leq \lambda) \quad (3)$$

$$rgdpc_t = \mu_i + \beta_2 X_t\, I(Debt_t \geq \lambda) \quad (4)$$

This methodology enables examining differentiating effects of government debt on economic growth in lower and upper regimes depending on whether the threshold variable is smaller or greater than the threshold value γ. Coefficients β_1 and β_2 indicate the considered effects in lower and higher regimes, respectively. To carry out the dynamic threshold regression, we have to test the linearity's null hypothesis against the threshold model in Equation (1), where the null hypothesis is H_0: b_1=b_2. According to Hansen (1996) and (2000), there is a problem executing the LM and Wald test statistics under the null hypothesis because of the λ parameter is not specified. Meanwhile, inferences were implemented by calculating a LM or Wald statistic for each potential value of λ. Thereafter, the inferences depend on the least upper bound of the Wald or LM for all potential λs (Law et al., 2013). As a consequence, the inferences were conducted via a model depending on bootstrapping whose validity and properties were developed by Hansen (1996) because the tabulations were not possible. Once the value of λ was obtained, the slope parameters $\hat{\beta}(\hat{\lambda})$ and $\hat{\gamma}(\hat{\lambda})$ could also obtained.

4. Empirical Results

As shown in Table 1, the descriptive statistics for each variable utilized in the model. It quite clear that the time series is free from any extreme values, which may affect the significance of the estimated results via examining the mean, standard deviation, minimum, and maximum of each variable of the sample. Table 2 shows the correlation matrix of the variables utilized in the estimation, respectively.

Table 1: Descriptive and Summary Statistics for Jordan, 1990-2017

Variables	Measurement	Mean	Std. Dev.	Minimum	Maximum
GDP per capita	US$ dollar	3083.54	433.52	2364.03	3764.78
Investment	% of GDP	26.059	5.239	19.243	36.632
G.Expenditure	% of GDP	22.062	0.607	21.141	23.024
Government debt	% of GDP	108.092	36.398	60.244	219.734
Trade openness	% of GDP	122.760	15.494	90.913	149.453
Inflation rate	%	4.499	4.575	-0.407	21.094

Table 2: Correlations between Variables for Jordan, 1990-2017

	GDP per capita	Capital	EXP	Debt	Open-ness	INF
GDP per capita	1.000					
Capital	-0.1987	1.000				
EXP	-0.5934	0.6394	1.000			
Debt	-0.8171	0.2808	0.6510	1.000		
Openness	0.0315	0.7273	0.5954	0.2947	1.000	
INF	0.2979	0.2617	0.0103	-0.0271	0.5223	1.0000

Note: GDP per capita = economic growth, Capital = gross investment, EXP= gross government expenditure as a % of the GDP, Debt= gross government debt as a % of the GDP, Openness= the terms of trade as a % of the GDP and INF= annual percentages of average consumer prices.

Table 3 shows the results from using Equation (2) for dynamic threshold estimation. The statistical significance of the threshold estimate was evaluated by the p-value calculated utilizing the bootstrap method with 1000 replications and a 15% trimming percentage. As shown in Table 3, the bootstrap p-values indicate that the test of no threshold effect can be rejected. Consequently, the time series is split into two regimes. The point estimate of the value of the debt-to-GDP threshold is 4.602 or 99.86%, with a corresponding 95% confidence interval of [4.601, 4.669] for the model, which is considered greater higher than the debt-to-GDP thresholds computed by Reinhart and Rogoff (2010) and Caner et al. (2010) for developing countries.

Table 3: Threshold Estimations of the Debt-to-GDP Ratio, 1990-2017

Threshold Estimates of Debt-to-GDP Values Government Debt as a percentage of the GDP = $\mathbf{Log}Debt_t$ Economic Growth = $Logrgdpc_t$	
LM Test For No Threshold	14.544
Bootstrap P-value	0.026
Threshold Estimate	4.602
95% Confidence Interval	[4.601601,4.669516]

As reported in Table 4, the empirical results of dynamic threshold estimation demonstrate the debt-to-GDP ratio's effect under the lower and upper regimes. Overall, the coefficient estimates of the explanatory variables are significant and positive for promoting growth below the threshold value. In contrast, when exceeding the debt-to-GDP ratio's threshold value, the effects of the explanatory variables on growth become insignificant and negative. The above findings demonstrate that economic growth reacts differently to explanatory variables for different debt-to-GDP threshold values.

First and foremost, government debt has a significant positive effect on economic growth below the debt-to-GDP threshold value. In contrast, when exceeding the debt-to-GDP threshold value, the impact of government debt on economic growth diminishes to be negatively significant. This finding agrees with the Laffer curve, where government debt has a positive effect on economic growth up to a certain secure level. Therefore, the over-borrowing tends to enlarge the effects of higher long-term debt service and repayment on economic growth.

Table 4: Regression Results using Government Debt (Debt) as a Threshold Variable. Dependent Variable: Economic Growth.

	Linear Model	Threshold Model Government Debt = Debt	
	OLS Without Threshold	Regime 1 Debt $\leq$ 4.602	Regime 2 Debt > 4.602
Constant	1.2938***	-0.0390	8.6357***
	(0.3434)	(0.2905)	(1.2026)
Investment	0.0067	0.1239***	-0.1065
	(0.0335)	(0.0247)	(0.0729)
G.Expenditure	-0.1142	0.0256	-0.3353
	(0.1511)	(0.0384)	(0.2258)
Public Debt	-0.1210*** (0.0410)	0.0730** (0.0306)	-0.2214** (0.0710)
Trade openness	0.0462	-0.0663	0.3886
	(0.1048)	(0.0323)	(0.2143)
Inflation rate	0.5660*** (0.1426)	1.004 *** (0.0521)	0.3886 (0.2143)
$\mathbf{rgdpc_{t-1}}$	0.9276***	0.9440***	0.2421
	(0.1440)	(0.0800)	(0.1235)
R-Square	0.9953	0.9992	0.9782
Heteroskedasticity Test (p-value)	0.2659	–	–
No. Observations	28	17	11

Notes: The standard errors are reported in parentheses (White-corrected for heteroskedasticity). The results correspond to the trimming percentage of 15%. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

Furthermore, investment has a significant positive association with economic growth below the debt-to-GDP threshold value, consistent with the theory. However, the effect is a negative and insignificant determinant when exceeding the debt-to-GDP threshold value. The negative impact is that the debt burden requires the government to

impose more taxes to serve debt, which tends to diminish capital return and lead to crowd-out private investment. On the other hand, the results reveal that below the debt-to-GDP threshold level, the coefficient of government expenditure is a positive and statistically insignificant determinant of economic growth. It is negative and insignificant when exceeding the debt-to-GDP threshold level, consistent with Maghyereh et al. (2002). A high tax rate can distort the economy and reduce the efficient allocation of resources.

Interestingly, the empirical findings highlight that trade openness has an insignificant negative correlation with economic growth in lower regime; meanwhile, in the upper regime, it has an insignificant positive impact on economic growth. The plausible explanation is because of trade barriers (Obeid and Awad, 2018). Moreover, the inflation rate coefficient enters positively and significant determinant for macroeconomic stability below the debt-to-GDP threshold level, which in contrast to the result of (Maghyereh et al. 2002). However, the inflation rate at the upper regime has a lower positive insignificant effect on economic growth beyond the debt-to-GDP threshold value.

Finally, the lag of the dependent variable (GDP per capita) coefficients is statistically significant. It positively affects economic growth below the deb-to-GDP threshold value, which is consistent with theoretical arguments. In contrast, it has an insignificant and lower positive effect when the debt-to-GDP ratio exceeds the threshold value compared to when it is lower than the threshold level. These findings indicate that debt accumulation can affect the GDP per capita when debts include private savings, internal interest rates, and inflow investments. Overall, economic growth has a closer link with the debt-to-GDP ratio. Thus, the debt-to-GDP threshold value plays a crucial role in promoting economic growth and ensuring efficient borrowing.

5. Conclusions

Recently, researchers' focus shifted towards identifying the debt-to-GDP threshold level, which can maintain growth regarding determining the effect of government debt on economic growth. This paper evaluated the gross government debt and economic growth nexus in Jordan from 1990 to 2017 by estimating whether a debt-to-GDP threshold exists for Jordan's case. This paper's novel contribution is using the regression model proposed by Hansen (2000) to capture the non-linear dynamics

effects of government debt on economic growth and provide a reliable debt-to-GDP threshold. The empirical results showed a significant debt-to-GDP threshold level in the relationship between government debt and economic growth in Jordan estimated by 99.86% of GDP, which is higher than the debt-to-GDP threshold computed by Maghyereh et al. (2002). Furthermore, exceeding the debt-to-GDP ratio definitely harms economic growth. Notably, the explanatory variables react differently under the upper and lower regimes. Arguably, government debt and economic growth relationship are contingent on the debt-to-GDP ratio. Jordan relied on debt accumulation to finance the budget balance deficit and not for funding productive expansionary projects. This paper finds that government debt is a potent variable in attaining economic growth if used in expansionary productive projects and limited with the optimal secure level.

This paper's policy implications are that increasing government debt to motivate economic growth is not a wise policy choice for Jordan. Therefore, reducing the debt-to-GDP ratio seems to enhance Jordanian economic performance; the average debt-to-GDP ratio of approximately 108% throughout the study appears to support this view. Hence, policymakers may eventually improve growth by reducing the debt-to-GDP ratio through efficient allocation of financial sources by reducing unproductive governent-funded programs. This strategy is crucial to attain a higher growth rate and must use timely austerity measures to curb shocks' effects, such as the financial crisis. Overall, the ambiguity regarding the estimations in Jordan is plausible because the financial sector's development in Jordan did not reach a sustainable debt level yet.

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Retirement Preparation: Hippies versus the X & Y Cohort

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ABSTRACT

This study analyzes the adequacy of retirement preparation of different age groups. Specifically, the hippie cohort (born between 1946 and 1954) is compared to the X and Y cohort (born between 1965 and 1987). For the hippie cohort, regarding internet use for obtaining information to make decisions about investments and saving, positive effects were found on satisfaction of retirement income from pensions and Social Security. These results were statistically insignificant in the X and Y cohorts. In the responses regarding the question of how to rate retirement income from job pensions and Social Security, the findings show that the hippie cohort is more likely than the X and Y cohorts to be satisfied with their retirement income from pensions and Social Security. The results show that the hippie cohort is better prepared for retirement compared to the X and Y cohort.

ملخص

تحلل هذه الدراسة مدى كفاية الاستعدادات للتقاعد لدى الفئات العمرية المختلفة. وعلى وجه التحديد، تمت مقارنة مجموعة الهيبي (المولودة بين عامي 1946 و 1954) بالمجموعتين X و Y (المولودتين بين عامي 1965 و 1987).بالنسبة لمجموعة الهيبي، تم الكشف عن وجود تأثيرات إيجابية لاستخدام الإنترنت للحصول على معلومات لاتخاذ قرارات بشأن الاستثمارات والادخار، على إرضاء العملاء فيما يتعلق بمداخيل التقاعد من المعاشات والضمان الاجتماعي. فيما كانت هذه النتائج بدون ذات دلالة إحصائية في المجموعتين X و Y.وفي الأجوبة المتعلقة بمسألة كيفية تصنيف مداخيل التقاعد من المعاشات والضمان الاجتماعي، تُظهر النتائج أن مجموعة الهيبي أكثر نزعة للرضا عن دخلهم التقاعدي بالمقارنة بمجموعتي X و Y. كما تظهر النتائج أن مجموعة الهيبي أكثر استعدادا للتقاعد مقارنة بالمجموعتين X و Y.

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ABSTRAITE

Cette étude analyse l'adéquation de la préparation à la retraite de différents groupes d'âge. Plus précisément, la cohorte hippie (née entre 1946 et 1954) est comparée à la cohorte X et Y (née entre 1965 et 1987). Pour la cohorte hippie, en ce qui concerne l'utilisation d'Internet pour obtenir des informations afin de prendre des décisions sur les investissements et l'épargne, des effets positifs ont été constatés sur la satisfaction des revenus de retraite provenant des pensions et de la sécurité sociale. Ces résultats étaient statistiquement non significatifs dans les cohortes X et Y. Dans les réponses concernant la question de savoir comment évaluer les revenus de retraite provenant des pensions de travail et de la sécurité sociale, les résultats montrent que la cohorte hippie est plus susceptible que les cohortes X et Y d'être satisfaite de ses revenus de retraite provenant des pensions et de la sécurité sociale. Les résultats montrent que la cohorte hippie est mieux préparée à la retraite que les cohortes X et Y.

Keywords: Hippie, X and Y Cohort, Social Security, Pensions, Retirement Preparation

JEL Classification: G51, G52, G59

1. Introduction and Literature Review

Baby boomers, nearly 74.1 million Americans (as of 2016) who were born between 1946 and 1964 and who comprise about one-fourth of the U.S. population are retiring. Therefore, retirement as a research subject seems to be cropping up in the news for all types of political, social, and economic reasons.

Teresa A. et al. (2000) showed that half of the individuals who filed for bankruptcy protection were baby boomers. However, Devaney et al. (2005) reported that older baby boomers (born 1946 to 1954) were somewhat more likely than the X&Y (born 1965 to 1987) cohorts to hold a retirement account. Also, Son (2012) reported that the internet usage for making saving and investment decisions grew from 2001 to 2007. A cohort is a group of people who share similar experiences and event. As a result, the members of a particular cohort are likely to share certain attitudes and consumer behavior (Geoffrey M. et al., 1994).

Cambridge dictionary defines the hippies as young people, specifically in the late 1960s and early 1970s, who typically had long hair, believed in peace, and opposed many accepted ideas about how to live. They have grown to a general state of prosperity. The hippies are nearing retirement or already have retired. For purposes of our study, we define the hippie cohort as older baby boomers, born between 1946 and 1954. The X and Y cohorts, born from 1965 to 1987, have experienced more prevalent technology in the state of economy of recession, prosperity, and bust (DeVaney & Chiremba, 2005). In addition, the hippie cohort is typically spenders while the X&Y cohorts are skeptical consumers in their buying habits (Sharon A., 2005). The X&Y cohorts are younger and therefore expected to live longer than the hippie cohort. This may also be a one of the reasons why the hippie cohort appears to be better prepared for retirement.

These observations motivated the comparison of adequacy of retirement preparation of these cohorts by the variables, including the internet or online. Thus, comparing the adequate retirement preparation of these cohorts is the interesting issue. This study suggests that the hippie and X and Y cohorts may differ according to socio-economic characteristics as well as the effects of events that have occurred during their lives, all of which may affect retirement preparation.

The challenge is having enough resources for individuals to live comfortably during their retirement. The life cycle hypothesis (Ando & Modigliani, 1963) and a number of different consumption theories imply that households should plan to smooth consumption over the rest of life in spite of fluctuations in current income. Young households are expected to spend more than their income due to relatively low earnings and higher expenses concerning education and housing. The theory of planned behavior suggests that individuals are more likely to behave in a manner consistent with their intentions when they have control over the factors involved (Ajzen, 1991).

Previous retirement adequacy studies have attempted to measure retirement consumption on the basis of pre-retirement income. Retirement adequacy is defined as being able to maintain pre-retirement spending, which is estimated by using a version of Palmer's (1992, 1994) required retirement ratio concept. In order to determine retirement adequacy,

Palmer (1992, 1994) focused on required replacement ratios. The required replacement ratio assumes that pre-retirement spending is a proxy for optimistic post-retirement spending and post retirement income should be able to maintain post-retirement spending. Tacchino and Littell (1999) assumed that 60-80% of current salary was appropriate for retirement needs projection. Grabble, Klock, and Lytton (2012) assumed 70 to 80% of current salary for retirement needs.

A few studies analyzed retirement adequacy of the baby boomer cohort (born from 1946 to 1964). Court et al. (2007) reported that after they formally retired, 60% of the baby boomers would need to work just to maintain 80% of their current consumption, and more than 40% (29 million) would be working at age 65. In addition, this paper reported that 84 % of the respondents in the survey expected to work after formally retiring, and 63 % said they couldn't see themselves ever retiring completely. On the other hand, Lusardi and Mitchell (2007) compared wealth holdings across two cohorts: the early baby boomers in 2004 and individuals in the same age group in 1992. They reported that planners in both cohorts arrived close to retirement with much higher wealth levels and displayed higher financial literacy than non-planners.

The extremely large number of the hippie cohort is expected to strain retirement, health care, and the other social institution. Technological developments associated with the Internet are likely to affect investors and financial markets (Brad M. et al., 2001). Son (2012) reported that the Internet usage for making saving and investment decision grew from 12% in 2001 to 20% in 2007.

This paper analyzes the differences between the hippies cohort and the X and Y cohorts for adequacy of retirement preparation with socio-demographic and work related variables, specifically, with the independent variable, the internet or online use for investment and saving decisions.

A cohort is a group of people who share similar experiences and events (Sharon, Devaney, & Chiremba, 2005). In demographic terms, a birth cohort is a group of people born during a given time period who share the same historic environment and many of the same life experiences, including tastes and preferences. As a result, the members of a particular

cohort are likely to share certain attitudes and consumer behaviors (Gepffrey M. et al., 1994).

In this study, the cohorts such as the hippies, the young people who lived in the late 1960s and early 1970s, and the X (born 1965-1976) and Y (born 1977-1987) were examined. Many individuals are currently using the Internet and online as the sources of the financial information for making decision about saving and investments. In a market that is efficient in the semi-strong sense, investors can have access to all publicly available information. The proposition that more information leads to better decision-making is intuitively appealing, depending on the relevance of the information to the decision (Brad M. Barber and Terrance Odean, 2001). Also, income resulting from saving and investment decisions, using the internet and online, will impact retirement preparation. The X and Y cohorts, who have experienced increased technology, are younger than the hippie cohort. However, this study assumes that the X&Y cohorts are less likely to be adequately prepared for retirement compared to the hippie cohort.

The purpose of this study is to assess and then compare the factors related to the adequacy of retirement preparation of the hippie cohort as well as the X and Y cohorts. Using data from the 2013 Survey of Consumer Finances (SCF) similarities and differences in retirement preparation between the hippie cohort and the X and Y cohorts were analyzed. Previous studies have focused on retirement preparation of the hippie cohort alone or the baby boomer cohort on the basis of pre-retirement income. However, none of these studies have focused on the similarities and differences of retirement preparation or adequacy of the hippie cohort and the X and Y cohorts, with the dependent variable, the internet or online use for investment or saving decisions, using the 2013 SCF. Finally, more education regarding the internet or online by government assistance (i.e., internet education in public libraries) will be effective for the hippie cohort, rather than the X&Y cohorts to raise satisfaction on retirement income from pensions and Social Security. The X&Y cohorts need to receive more income from pensions and Social Security for satisfaction of retirement income, compared to the hippie cohort. This study will contribute to the literature regarding the retirement and the findings will have policy implications for public policy makers. For example, tax policies such as more lenient deductions or tax credits could be

implemented to encourage retirement savings for the X and Y Cohort. In addition, educational programs regarding using technology for making saving and investment decisions could be implemented to the hippie cohort.

2. Data and methodology

For this study, data was obtained from the 2013 SCF collected by NORC (National Opinion Research Center), a social science research center at the University of Chicago, which is a triennial interview survey of U.S. families sponsored by Board of Governance of the Federal Reserve System with the cooperation of the U.S. Department of the Treasury. The survey collects information on families' total income before taxes for the calendar year preceding the survey. The data covers the status of families as of the time of the interview, including detailed information on their balance sheets and other financial statements as well as on their pensions, labor force participation, and demographic characteristics. The variables are overridden by logically equivalent information to maintain consistency of data. Also, the SCF addresses problems of bias directly by using a dual-frame sample design of a standard multi-state area-probability sample and a list sample from statistical records (the Individual Research Tax File).

With data from the 2013 SCF, the study used a binary probit model and an ordered probit model in more detail because the dependent variables were in five categories. The dependent variables for analysis were comprised of adequacy of pensions and Social Security income for retirement. In the case of the adequacy of pensions and Social Security income for retirement, the dependent variables had 5 alternatives: totally inadequate, inadequately, enough to maintain living standards, satisfactory, and very satisfactory. The independent variables were also broken down into three categories: socio-demographic variables, work-related variables, and investments and saving-related variables.

Previous research has shown the analyses of only the hippie cohort (Lawrence & Hassan, 2007) regarding retirement plan eligibility and retirement plan contributions or the baby boomer cohort regarding the retirement savings (DeVaney & Chiremba, 2005) and regarding retirement security (Lusardi & Mitchell, 2007). However, this study used an additional independent variable of the internet or online use for

investments and saving decision and then compare the similarities and differences between the hippie cohort, who were born 1946 to 1954 and the X & Y cohort, who were assumed the generation born 1965 to 1976 and 1977 to 1987, respectively, using the methodology of the ordered probit model in order to effectively analyze five dependent categories/alternatives in the case of the adequacy of pensions and Social Security of income for retirement with the recent data of the 2013 SCF.

The probit model is $P(y=1)=\phi(\sum_{k=1}^{k} BkXk)$ *and* $P(y=0)=1-\phi(\sum_{k=1}^{k} BkXk)$ where $Y=\{1 \quad p\geq 0.5, 0 \quad p<0.5\}$.

Also, the ordered probit model is $P(y=1)=\phi(-\sum_{k=1}^{k} BkXk)$, $P(y=2)=\phi(\mu 2-\sum_{k=1}^{k} BkXk)-\phi(-\sum_{k=1}^{k} BkXk) \cdots P(y=j)=1-\phi(\mu(j-1)-\sum_{k=1}^{k} BkXk)$.

This study defined the dependent variable to be of adequacy to maintain living standards of job pensions and Social Security income, which was a categorical variable in the survey**.** Income is defined as a family's total retirement income, which includes 401 (k) accounts and all other types of pensions the respondents in the survey receive (or expect to receive) from Social Security and job pensions. In addition, variables such as the potential cost to maintain living standards might be not included in the rate of adequacy, depending on the respondents. But this paper assumed that respondents in the survey answered the questions after considering the comprehensive aspects. These may need to be further researched in the future.

First, the paper estimated a binary probit model in which the dependent variable was coded as 0 if the respondent rated the retirement income from job pensions and Social Security income totally inadequate or inadequate and 1 if satisfactory or very satisfactory for the regression. Second, the paper estimated an ordered probit model in which the dependent variable was coded as 1 if the respondent rated the retirement income from job pensions and Social Security income totally inadequate, 2 if inadequate, 3 if enough to maintain living standards, 4 if satisfactory, and 5 if very satisfactory.

Based on prior research and availability of data, the paper used the following as explanatory variables: socio-demographic variables (age, gender, marital status, household size, health, income, and education), work-related variables (length of employment, number of weeks worked), and investments and saving decisions-related variable (the Internet or online use). The reference was left out and female, income 125 or over, not married, not excellent for probit regression or not poor for ordered probit regression, college or graduate school, less than 30 yr, less than 40, not Internet or online.

The paper considered the following hypotheses.

Socio-demographic variables, work-related variables, and investments and saving decisions-related variable were statistically significant variables affecting adequacy of pensions and Social Security income for retirement for the hippie cohort and the X and Y cohorts. The hippie cohort will be more likely than the X and Y cohort to be satisfied with their retirement income from pensions and Social Security.

3. Findings

Table 1 showed that the hippie cohort was 6.31% more likely than the X and Y cohorts in satisfactory of the retirement income from Social Security income and job pensions. In their responses regarding the question of how they rate their retirement income from pensions and Social Security income, the hippie cohort indicated 31.14% for “totally inadequate”, 18.82% for “inadequate”, 30.99% for “enough to maintain living standards”, 8.76% for “satisfactory”, and 10.29% for “very satisfactory” while the X and Y cohorts indicated 36.15%, 22.79%, 28.31%, 7.65%, and 5.09%, respectively. Also, in the gender, the male was 52.68% more likely than the female. But the paper assumed that the respondents answered the questions, as a representative of their households as heads of the households. Even if not in Table, in the analysis of 2010 SCF data affected by the financial crisis in 2008, satisfactory (very satisfactory) showed 9.04% (7.64%) less than 9.39% (8.76%) in the analysis of the 2013 SCF data.

Results from the probit regression model were shown regarding the X and Y cohorts in Table 2 and the hippie cohort in Table 3.

In Table 2, the research found the following variables to be statistically significant in explaining adequacy of pensions and Social Security income: male, age, household size, income (level below $50,000 or $75,000-$100,000), education (elementary or less, high school), married status (married), and health (excellent). Men (married, excellent health) are more likely than women (not married, not excellent health) to be willing to be satisfied with their retirement income from pensions and Social Security. People who completed elementary school or less (high school) are more likely to be satisfied with retirement income from pensions and Sociality Security, compared with people who completed undergraduate or graduate school. People are less (more) likely to be satisfied with retirement income from pensions and Social Security as the age (the household size) increases. Those who are household's income less than $50,000 ($75,000-$100,000) are less (more) likely to be satisfied with retirement income from pensions and Sociality Security, compared with income $125,000 or over.

In Table 3, in the hippie cohort, additional variables such as number of weeks worked per year (40 and over) and the internet or online were statistically significant. Men were more likely than women to be adequate enough to maintain living standard. Those who use the Internet or go online for obtaining information to make decisions about investments and saving are more likely than those who does not use the Internet or go online to be satisfied with their retirement income from pensions and Social Security. Men (married, excellent health) are more likely than women (not married, not excellent health) to be willing to be satisfied with their retirement income from pensions and Social Security. People who completed middle (high school) are less likely to be satisfied with retirement income from pensions and Sociality Security, compared with people who completed undergraduate or graduate school. People are more (less) likely to be satisfied with retirement income from pensions and Social Security as the age (the household size) increases. Those who are household's income less than $50,000 ($75,000-$100,000) are less (more) likely to be satisfied with retirement income from pensions and Sociality Security, compared with income $125,000 or over. Those who have worked for 40 weeks and over per year are more likely than those who have worked for less than 40 weeks per year to be satisfied with their retirement income from pensions and Social Security.

In Table 1-1 the research illustrates that the differences between the hippie cohort and the X&Y cohorts were statistically significant regarding socio-demographic and work-related variables and investments and saving-related variable. In Table 1-2, the hippie cohort is more likely to hold household income and be of adequacy of retirement income than the X&Y cohorts.

Even though not in Table, results from ordered probit regression without classification of cohorts showed that the satisfaction on retirement income from pensions and Social Security would be likely to be better with more age, more income, less household size, and less education.. Previous research has shown similarities in age (Andrew, 1992; Springstead and Wilson, 2000) and income (Andrew, 1992; Springstead and Wilson, 2000; Lawrence and Hassan, 2007; Lee, Hassan, and Lawrence, 2018).

The findings support the theory of planned behavior which suggests that individuals are more likely to behave in a manner consistent with their intentions when they have control over the factors involved (DeVaney & Chiremba, 2005) when assuming that individuals with more household income have more adequacy of retirement income.

In Table 2 and Table 6, the findings show that as the X and Y cohorts aged, they were less likely to have enough for the retirement income they received or expected to receive from Social Security and pensions to maintain their living standards. If any, other factors not taken into consideration as independent variables may need additional research. But as they are closer to their retirement, they identify that they need more pensions and Social Security income for retirement. The hippie cohort is more likely to have adequate pensions and Social Security income for retirement because their income increases as they get older.

The results above supported the life-cycle saving hypothesis that household savings tends to increase with age. The life-cycle savings hypothesis assumes that a household attempts to maintain a consistent level of consumption over the lifetime of its members: many households borrow when its members are younger and their earnings are lower and then save in anticipation of retirement when its members are in middle life and their earnings are higher; most households reduce their savings during retirement (DeVaney & Chiremba. 2005).

Married X and Y cohorts are more likely to have adequate pensions and Social Security income for retirement because they can depend on their spouse's pensions or Social Security income. Regarding health, the X and Y cohorts who have excellent health are more likely than those who have do not have excellent health to have adequate pensions and Social Security income for retirement because they work longer and spend less on health care.

Work history (number of weeks worked per year) and the Internet or online were statistically insignificant in the X and Y cohorts while in the hippie cohort, those were statistically significant. Specifically, the Internet or online use as sources of information to make decisions about investments and saving are more necessary to them as they are close to retirement, which affects their pensions and Social Security income.

Results from the ordered probit model were presented in Table 4 regarding the X and Y cohorts and in Table 5 regarding the hippie cohort. The marginal effects for the ordered probit model were given in Table 6 regarding the X and Y cohorts and in Table 7 regarding the hippie cohort.

In Table 4, it was shown that the X and Y cohorts who were below $50,000 might be less likely than those who were $125,000 or over to have adequate pensions and Social Security income. This means that they have smaller resources than required for retirement. In addition, all the income levels were significant in the ordered regression. The satisfaction of retirement income from pensions and Social Security is better (from totally inadequate to maintain living standards to inadequate to enough to satisfactory to very satisfactory) with lower age, men compared with women, better health compared with poor health, higher education at the elementary or less level and high school level compared with undergraduate or graduate, and lower income at the level of less than $50,000 income and higher income at the level of $50,000-$125,000 income compared with income $125,000 or over.

Regarding education (college), even if not in Table 4, the X and Y cohorts who graduated from college were less likely than those who did not graduate from college to have adequate pensions and Social Security income because of increased expenditures.

Except education (elementary or less) and length of employment (30 yr and over)), all the variables were significant in the hippie cohort in Table 5. The satisfaction of retirement income from pensions and Social Security is better (from totally inadequate to maintain living standards to inadequate to enough to satisfactory to very satisfactory) with higher age, lower household size, married person compared with not married person, men compared with women, better health compared with poor health, lower education at the middle and high school level compared with undergraduate or graduate, and lower income at the level of less than $50,000 income, higher income at the level of $50,000-$125,000 income compared with income $125,000 or over, and lower number of weeks worked per year (40 and over) compared with number of weeks worked per year (less than 40 weeks). This indicates that in the case of the hippies, as they approach retirement, their participation in retirement plans increases.

Although not in Table, in the analysis of 2010 SCF data affected by the financial crisis in 2008, other variables except age, income less than $50,000, elementary or less in the X and Y cohorts and age, marital status, middle school, number of weeks worked per year (40 and over), and Internet or online in the hippies cohort were statistically insignificant. Especially, income at every level except less than $50,000 is statistically insignificant both in the X&Y cohorts and in the hippie cohort.

In Table 6, in the X and Y cohorts, female, income, household size, married status, health, education, number of weeks worked per year (40 and over), and the Internet and online had roughly the same trends within the same level. Regarding the retirement income from pensions and Social Security income, a one unit increase in each variable was associated with being less likely to be in the totally inadequate or inadequate and more likely to be in the satisfactory or very satisfactory. In addition, age, length of employment (30 year and over), income (less than $50,000), and education (middle school) had the same trends within the same level. A one unit increase in each variable was associated with being more likely to be in the totally inadequate or inadequate and less likely to be satisfactory or very satisfactory. Furthermore, the marginal effects of adequacy on pensions and Social Security income increased as health levels increased. Males are more likely than females to have adequate pensions and Social Security income.

These have similar results with previous studies such as health is another factor that influences retirement preparation (Jet et al, 2007; Mutchler et al., 1997; Shultz and Wang, 2007); Health problems might lead to constraints on an individual's ability to perform effectively or further participate in the workforce. Consequently, employees with health problems will be more likely to retire (Barnes Farrell, 2003).

In Table 7 as Table 3 and 5, in the hippie cohort, the research shows that using the internet or online for getting information to make decisions about investments and saving is helpful.

Previous retirement adequacy studies mainly focused on postretirement income which should be able to maintain post-retirement spending. But each person may have different retirement adequacy, depending the factors such as health, age, job, family, future retirement plan or financial plans as well as their post retirement income and spending. Thus, retirement adequacy should be thought under the comprehensive perspectives. For this, using the analyses of the answers from respondents who can consider those factors together is an effective method for measuring adequacy of retirement income even if their answers may partly depend on such factors as the level of their future time perspective, the level of financial knowledge, and economic projection capacity. The paper assumed that, on average, the respondents answered the questions after considering their comprehensive aspects regarding adequacy of retirement income, compared with previous studies so that this may need to further research in the future due to its subjectivity.

Although not seen in the tables, the internet and online service was the highest, 19.45% (4,258 respondents) of all observations in the survey, one of thirty-two sources of information for the respondents to use to make decisions about saving and investments. Banker, friends and relatives, and financial planner were 14.79%, 14.29%, and 12.92%, respectively. Most people have access to the Internet or online service and the internet usage for making saving and investment decision is sharply increasing (Son, 2012). The young cohorts, X&Y cohorts were more likely to have access to the Internet than the old cohort, hippie cohort as shown in Table 1-1. But the former was less likely to hold household income as shown in Table 1-2 and to be less close to the actual retirement than the latter.

Traditionally, most old workers do not seriously start planning for retirement until very close to the actual retirement decision.

Unlike other research which has explored adequacy of pensions and Social Security income, using the internet or online for information to make decision regarding investments and saving increases adequacy on pensions and Social Security income in the hippie cohort and the X and Y cohorts. Unfortunately, using the internet or online for information to make decisions about investments and saving on adequacy of pensions and Social Security income in the X and Y cohort was statistically insignificant. The findings regarding the hippie cohort may be the result of an increase in adequacy of pensions and Social Security income by increased use of the internet or online for information to make decisions about investments and saving.

4. Conclusions and Policy Implications

This study examined the adequacy of the retirement income of the hippie cohort compared with that of the X&Y cohorts. The empirical model for this study is that the adequacy of retirement income from Social Security and job pensions is a function of socio-demographic variables, work-related variables, and investments and saving decisions-related variables. The life-cycle savings hypothesis and the theory of planned behavior, which provided a framework for examining retirement savings behavior, were used for comparing adequacy of retirement income of the hippie cohort with that of the X&Y cohorts.

Previous research has shown the analyses of only the hippie cohort (Lawrence and Hassan, 2007) regarding retirement plan eligibility and retirement plan contributions or the baby boomer cohort regarding retirement savings (DeVaney & Chiremba, 2005) and retirement security (Lusardi and Mitchell, 2007). Also, some studies (Palmer, 1992 & 1994; Tachino and Littell, 1999) regarding retirement adequacy focused on required replacement rations or post-retirement income which should be able to maintain post-retirement spending. However, adequacy of retirement income may be different from retirees' residence, health, age, job, family, future retirement plan or financial plans as well as post retirement income and spending. Thus, this paper analyzed the answers of respondents in the survey, to estimate adequacy of retirement income

because respondents may consider the subjective and objective factors together with regard to adequacy of retirement income.

The focus of this paper is the adequacy of pensions and Social Security income as a dependent variable and the variables such as using the internet or online as additional independent variables to compare the similarities and differences of between the hippie cohort and the X and Y cohorts. In both the X and Y cohorts and the hippie cohort, gender, income, and health have roughly the same trends within the same level. That is, regarding the retirement income from pensions and Social Security income, a one unit increase in each variable is associated with being less likely to be in the totally inadequate and inadequate and more likely to be in the satisfactory and very satisfactory categories. Specifically, using the internet or online for getting information to make decisions about investments and saving is helpful to the hippie cohort for the adequate preparation for retirement, even if it is statistically insignificant in the X and Y cohort. In their responses regarding the question of how to rate retirement income from pensions and Social Security, the results indicate that the hippie cohort is better off than the X and Y cohorts regarding adequate pensions and Social Security income.

Income and health are statistically and positively significant in the X&Y cohorts and hippie cohort on adequacy of retirement income. Age is statistically and negatively significant in the X&Y cohorts while positively in the hippie cohort. Also, X&Y is less likely to be of adequacy of retirement income than the hippie cohort. Thus, retirement preparation in the X&Y cohorts is more serious than that in the hippie cohort. Specially, in order to increase adequacy of retirement income from pensions and Social Security, more education regarding the Internet or online by government assistance will be effective for the hippie cohort, rather than the X&Y cohorts, while giving more income from pensions and Social Security will be necessary to the X&Y cohorts, compared to the hippie cohort. The Internet is the most influential tools as the information sources for making investing and saving decisions. The Internet services is a factor which affect adequacy of retirement income with income, health, and education. The younger X&Y cohort in is less likely to be of Adequacy of retirement income than the older hippie cohort. Thus, retirement is no longer a concern only for the second half of life,

specially, given the precipitous shift of the risk of funding retirement from employer to the individual employee and increased life expectancy.

This study will contribute to the literature regarding retirement preparation. The findings will have implications for both public policy makers and financial practitioners to make policy which is related with retirement of the hippie cohort and the X and Y cohorts. Future studies might examine the rate of adequacy of retirement income, including subjective factors and objective factors such as personal savings and investments across countries.

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Appendix

Table1: Descriptive Statistics

Variable		mean	Standard Deviation	Percentage (N=30,075)
Gender				
	Male			76.34
	Female			23.66
Age		51.75	16.17	
	25 or less			4.79
	26-48			37.36
	49-57			21.23
	58-67			19.57
	68 and above			17.16
Income		166,058	748,756	
	$49,999 or less			60.20
	$50,000-74,999			10.58
	$75,000-99,999			7.62
	$100,000-124,999			5.02
	$125,000 and more			16.58
Household Size		2.64	1.46	
	1			22.14
	2			36.06
	3			15.25
	4			15.13
	5 and more			11.42
Marital Status				
	Married			54.63
	Separated			3.34
	Divorced			15.30
	Widowed			7.41
	Never married			19.31
Health				
	Excellent			28.18
	Good			48.41
	Fair			18.28
	Poor			5.13
Education		13.96	2.70	
	Elementary or less			0.91
	Middle school			2.43
	High school			32.32
	College			44.87
	Graduate			19.47
		25.49	12.97	

Table1: (Coudtinu) Descriptive Statistics

Variable		mean	Standard Deviation	Percentage (N=30,075)
Length of employment				
	4 or less			40.71
	5-9			4.89
	10-19			12.73
	20-29			15.77
	30 and more			25.91
Number of weeks worked per year		49.75	7.08	
	9 or less			28.81
	10-19			0.61
	20-29			1.49
	30-39			1.71
	40 and more			67.39
Sources of information for saving and investments				
	Internet/Online			17.27
	Banker			14.91
	Financial Planner			12.96
	Others			54.86
Rate in Retirement Income				
	Totally Inadequate			32.16
	Inadequate			19.52
	Enough to maintain living standards			30.17
	Satisfactory			9.39
	Very Satisfactory			8.76
Retirement Income (Hippies cohort)				
	Totally Inadequate			31.14
	Inadequate			18.82
	Enough to maintain living standards			30.99
	Satisfactory			8.76
	Very Satisfactory			10.29
Rate in Retirement Income (X & Y cohort)				
	Totally Inadequate			36.15
	Inadequate			22.79
	Enough to maintain living standards			28.31
	Satisfactory			7.65
	Very Satisfactory			5.09

Table 1-1: Chi-Square Analysis of Age Groups and Selected Characteristics (N=18,535) [In percent]

	X&Y Cohorts	**Hippies Cohort**	**P-value**
Gender:			
Male	77.04	79.45	0.0001
Female (Reference Group)	22.96	20.55	
Household Income:			<0.0001
income lt50	52.79	57.36	
income50 - 75	14.93	9.30	
income75 - 100	9.79	7.96	
income100 – 125	6.76	5.10	
Income 125 or over (Reference Group)	15.73	20.29	
Household size:			<0.0001
1	15.49	23.08	
2	20.92	52.26	
3	18.83	13.15	
4	24.52	7.26	
5 or more	20.25	4.25	
Marital Status:			<0.0001
Married	51.40	63.49	
Not married (Reference Group)	48.60	36.51	
Health:			<0.0079
Excellent	29.35	27.55	
Not excellent (Reference Group)	70.65	72.45	
Education:			<0.0001
Elementary or less	0.77	1.11	
Middle school	2.35	2.36	
High school	32.83	27.84	
College or over (Reference Group)	64.05	68.70	
Length of employment :			<0.0001
Less than 30yr (Reference Group)	96.41	46.40	
30 or over	3.56	53.60	
Number of weeks worked per year:			<0.0001
Less than 40 (Reference Group)	16.33	36.00	
40 or more	83.67	64.00	
Internet or online:			<0.0001
Internet or online	22.63	14.33	
Not Internet or online (Reference Group)	77.37	85.67	
Adequacy of retirement income*:			<0.0001
Inadequate (unsatisfactory)	82.22	68.93	
Satisfactory (adequate)	17.78	31.07	

*N=13,027

Table 1-2: Chi-Square Analysis of Variance (ANOVA) Comparing the Selected Characteristics by Age Groups (N=15,019) [Means]

	X&Y Cohorts	Hippies Cohort	F-test p-value
Household income	95,101	220,951	<.0001

Table 2: Probit Regression Results (X and Y Cohorts (1965-1987))****

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory ,Very Satisfactory

	B	S.E.	t-value	p-value
Intercept	0.235350	0.037244	6.32	<.0001***
male	0.033047	0.012274	2.69	0.0071***
age	-0.003318	0.000708	-4.69	<.0001***
income lt50	-0.049177	0.014285	-3.44	0.0006***
income50 - 75	0.009393	0.015957	0.59	0.5561
income75 - 100	0.042758	0.017623	2.43	0.0153**
income100 - 125	0.031629	0.020066	1.58	0.1150
Household size	0.005319	0.003070	1.73	0.0832*
Marital Status(married)	0.020335	0.012019	1.69	0.0907*
Health(excellent)	0.030227	0.009630	3.14	0.0017***
Education Elementary or less	0.124280	0.047899	2.59	0.0095***
Middle School	-0.033229	0.029062	-1.14	0.2529
High School	0.021264	0.009946	2.14	0.0325**
Length of Employment (30 yr and over)	0.011958	0.023321	0.51	0.6081
Number of weeks worked per year(40 and over)	0.005619	0.011891	0.47	0.6366
Internet or Online	-0.006854	0.010340	-0.66	0.5074

* p<0.10* *p<0.05 *** p<0.01 **** The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health (excellent), not excellent, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

Table 3: Probit Regression Results (Hippie Cohort)****

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory, Very Satisfactory

	B	**S.E.**	**t-value**	**p-value**
Intercept	-0.805561	0.172671	-4.67	<.0001***
male	0.066124	0.024750	2.67	0.0075***
age	0.020055	0.002657	7.55	<.0001***
income lt50	-0.089091	0.021082	-4.23	<.0001***
income50 - 75	0.037722	0.030118	1.25	0.2104
income75 - 100	0.050992	0.030916	1.65	0.0991*
income100 - 125	0.016276	0.034754	0.47	0.6396
Household size	-0.065058	0.008240	-7.90	<.0001***
Marital Status(married)	0.102962	0.023327	4.41	<.0001***
Health(excellent)	0.093324	0.016073	5.81	<.0001***
Education Elementary or less	0.019361	0.064758	0.30	0.7650
Middle School	-0.238596	0.045743	-5.22	<.0001***
High School	-0.111082	0.018263	-6.08	<.0001***
Length of Employment (30 yr and over)	-0.004398	0.023851	-0.18	0.8537
Number of weeks worked per year(40 and over)	-0.131014	0.024274	-5.40	<.0001***
Internet or Online	0.073059	0.021073	3.47	0.0005***

* p<0.10* *p<0.05 *** p<0.01 **** The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health (excellent), not excellent, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

Table 4: Ordered Probit Regression Results (X and Y Cohorts (1965-1987))****

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory ,Very Satisfactory

	B	S.E.	t-value	p-value
male	0.108543	0.029543	3.67	0.0002***
age	-0.004930	0.001675	-2.94	0.0032***
income lt50	-0.102245	0.034743	-2.94	0.0033***
income50 - 75	0.079858	0.038635	2.07	0.0387**
income75 - 100	0.178277	0.041553	4.29	<.0001***
income100 - 125	0.129795	0.046539	2.79	0.0053***
Household size	0.007038	0.007382	0.95	0.3404
Marital status (married)	0.045756	0.028659	1.60	0.1104
Health excellent	0.463652	0.067130	6.91	<.0001***
Good	0.409649	0.065432	6.26	<.0001***
Fair	0.364280	0.068108	5.35	<.0001***
Education Elementary or less	0.356296	0.115275	3.09	0.0020***
Middle School	-0.020232	0.070565	-0.29	0.7743
High School	0.043174	0.023893	1.81	0.0708*
Length of employment (30 yr and over)	-0.045799	0.057696	-0.79	0.4273
Number of weeks worked per year (40 and over)	0.031917	0.029581	1.08	0.2806
Internet or Online	0.010646	0.024825	0.43	0.6680
limit1	-0.039550	0.103885	-0.38	0.7034
limit2	0.546924	0.104000	5.26	<.0001***
limit3	1.468336	0.104481	14.05	<.0001***
limit4	1.970504	0.105277	18.72	<.0001***

* p<0.10* *p<0.05 *** p<0.01 **** The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health, not poor, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

Table 5: Ordered Probit Regression Results (Hippie Cohort)****

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory ,Very Satisfactory

	B	**S.E.**	**t-value**	**p-value**
male	0.131902	0.047053	2.80	0.0051***
age	0.035089	0.005228	6.71	<.0001***
income lt50	-0.110655	0.043361	-2.55	0.0107**
income50 - 75	0.104885	0.057639	1.82	0.0688*
income75 - 100	0.136829	0.059719	2.29	0.0220**
income100 - 125	0.211033	0.067530	3.13	0.0018***
Household size	-0.075671	0.014879	-5.09	<.0001***
Marital status (married)	0.118759	0.043846	2.71	0.0068***
Health				
Excellent	0.647727	0.067158	9.64	<.0001***
Good	0.611954	0.064062	9.55	<.0001***
Fair	0.367876	0.066701	5.52	<.0001***
Education				
Elementary or less	-0.004246	0.140138	-0.03	0.9758
Middle School	-0.467130	0.093835	-4.98	<.0001***
High School	-0.118602	0.034566	-3.43	0.0006***
Length of employment (30 yr and over)	-0.046184	0.045967	-1.00	0.3150
Number of weeks worked per year (40 and over)	-0.224785	0.047148	-4.77	<.0001***
Internet or Online	0.077082	0.041506	1.86	0.0633*
limit1	1.949481	0.338841	5.75	<.0001***
limit2	2.435496	0.339208	7.18	<.0001***
limit3	3.366215	0.340166	9.90	<.0001***
limit4	3.836999	0.340619	11.26	<.0001***

* p<0.10* *p<0.05 *** p<0.01 **** The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health, not poor, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

Table 6: Ordered Probit Marginal Effects (X and Y Cohorts (1965-1987)*

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory ,Very Satisfactory

	Meff_p1	**Meff_p2**	**Meff_p3**	**Meff_p4**	**Meff_p5**
male	-0.0402433	-0.0015449	0.0193548	0.0111802	0.0112531
age	-0.001828	-0.000070175	0.000879173	0.000507852	0.000511163
income lt50	0.0379082	0.0014552	-0.0182317	-0.0105315	-0.0106002
income50 - 75	-0.029608	-0.0011366	0.0142398	0.0082256	0.0082792
income75 - 100	-0.0660979	-0.0025374	0.0317894	0.0183631	0.0184828
income100 - 125	-0.0481227	-0.0018474	0.0231444	0.0133693	0.0134564
Household size	-0.0026092	-0.000100165	0.0012549	0.000724887	0.000729614
Marital status (married)	-0.0169646	-0.000651246	0.008159	0.004713	0.0047438
Health					
excellent	-0.1719031	-0.0065991	0.0826759	0.0477575	0.0480689
Good	-0.1518812	-0.0058305	0.0730465	0.0421951	0.0424702
Fair	-0.1350602	-0.0051848	0.0649565	0.0375219	0.0377666
Education					
Elementary or less	-0.1321	-0.0050711	0.0635328	0.0366995	0.0369388
Middle School	-0.0075012	-0.000287959	0.0036077	0.002084	0.0020975
High School	-0.0160072	-0.000614494	0.0076986	0.0044471	0.0044761
Length of employment (30 yr and over)	-0.0169803	-0.000651848	0.0081666	0.0047174	0.0047482
Number of weeks worked per year (40 and over)	-0.0118336	-0.000454273	0.0056913	0.0032876	0.003309
Internet or Online	-0.003947	-0.000151519	0.0018983	0.0010965	0.0011037

* The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health, not poor, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

Table 7: Ordered Probit Marginal Effects (Hippie Cohort)*

Dependable variable: The rate of the retirement income you receive (or expect to receive) from Social Security and job pensions: Totally Inadequate to maintain living standards, Inadequate, Enough, Satisfactory ,Very Satisfactory

	Meff_p1	**Meff_p2**	**Meff_p3**	**Meff_p4**	**Meff_p5**
male	-0.0423806	-0.0079	0.0124934	0.0137748	0.0240123
age	-0.0112741	-0.0021016	0.0033235	0.0036644	0.0063878
income lt50	0.0355539	0.0066274	-0.010481	-0.0115559	-0.0201444
income50 - 75	-0.0336999	-0.0062818	0.0099344	0.0109533	0.019094
income75 - 100	-0.0439635	-0.008195	0.01296	0.0142893	0.0249092
income100 - 125	-0.0678054	-0.0126393	0.0199885	0.0220385	0.0384178
Household size	0.0243133	0.0045321	-0.0071674	-0.0079025	-0.0137756
Marital status (married)	-0.0381577	-0.0071128	0.0112485	0.0124022	0.0216197
Health					
excellent	0.2081166	-0.038794	0.061351	0.0676433	0.1179164
Good	-0.1966227	-0.0366515	0.0579627	0.0639075	0.1114041
Fair	-0.1181995	-0.022033	0.0348442	0.0384179	0.0669704
Education			-	-	-
Elementary or less	0.0013643	0.000254304	0.00040217	0.000443418	0.00077297
Middle School	0.1500903	0.0279776	-0.0442453	-0.0487832	-0.0850394
High School	0.0381072	0.0071034	-0.0112337	-0.0123858	-0.0215911
Length of employment (30 yr and over)	0.0148392	0.0027661	-0.0043745	-0.0048231	-0.0084077
Number of weeks worked per year (40 and over)	0.0722239	0.0134629	-0.021291	-0.0234746	-0.0409212
Internet or Online	-0.0247666	-0.0046166	0.007301	0.0080498	0.0140325

*The reference category is for male, female, for income, income 125 or over, for marital status (married), not married, for health, not poor, for education, college or graduate school, for length of employment, less than 30 yr, and for number of weeks worked per year, less than 40, for Internet or online, not Internet or online.

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Relationship between Foreign Direct Investment and Economic Growth in Selected Transition Economies

Yavuz Özek[1]

ABSTRACT

Economies transitioning from the command economy to the free market economy experienced several important reforms throughout the transition period, these reforms have affected the sociological structures of the countries as well as the economic ones. While sociological change has an impact on the structure of the labor factor, economic transition has changed the origin and amount of capital. In this study, the effect of the transformation on the countries through the capital channel was investigated by examining the effect of foreign direct investments on transition economies in the context of economic growth. The results show that when countries are evaluated as a whole, foreign direct investments can affect the economy only in the long term. As for country-based analyzes, it is concluded that foreign direct investments are effective on economic growth in Slovakia, Slovenia and Hungary economies.

ملخص

شهدت الاقتصادات التي تمر بمرحلة انتقالية من الاقتصاد الموجه إلى اقتصاد السوق الحر العديد من الإصلاحات المهمة طوال الفترة الانتقالية، وقد أثرت هذه الإصلاحات على الهياكل الاجتماعية للبلدان فضلا عن الهياكل الاقتصادية. ففي حين أن التغيير الاجتماعي له تأثير على هيكل عامل الشغل، فقد غيّر التحول الاقتصادي منشأ رأس المال ومبالغه. في هذه الدراسة، تم التحقيق في تأثير التحول على البلدان من خلال قناة رأس المال بدراسة تأثير الاستثمارات الأجنبية المباشرة على الاقتصادات التي تمر بمرحلة انتقالية في سياق النمو الاقتصادي. وتظهر النتائج أنه عندما يتم تقييم البلدان ككل، يمكن للاستثمارات الأجنبية المباشرة أن تؤثر على الاقتصاد على المدى الطويل فقط. أما بالنسبة للتحليلات القطرية، فقد خلصنا إلى أن الاستثمارات الأجنبية المباشرة فعالة في تحقيق النمو الاقتصادي في اقتصادات سلوفاكيا وسلوفينيا والمجر.

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ABSTRAITE

Les économies qui passent de l'économie planifiée à l'économie de marché ont connu plusieurs réformes importantes tout au long de la période de transition, ces réformes ont affecté les structures sociologiques des pays ainsi que les structures économiques. Si l'évolution sociologique a un impact sur la structure du facteur travail, la transition économique a modifié l'origine et le montant du capital. Dans cette étude, l'effet de la transformation sur les pays par le biais du canal des capitaux a été étudié en examinant l'effet des investissements directs étrangers sur les économies en transition dans le contexte de la croissance économique. Les résultats montrent que lorsque les pays sont évalués dans leur ensemble, les investissements directs étrangers ne peuvent affecter l'économie qu'à long terme. Quant aux analyses par pays, il est conclu que les investissements directs étrangers sont efficaces sur la croissance économique en Slovaquie, Slovénie et Hongrie.

Keywords: Transition Economies, Foreign Direct Investments, Panel Data

JEL Classification: F21, F43, C33

1. Introduction

The notion of foreign direct investment (FDI, hereafter) has become important for emerging market economies since 1990s. In 1990s, amount of FDI has started to increase in early 1990s (Baiashvili and Gattini, 2020: 2). Reason of increasing importance can be seen inside of the definition of FDI. According to FDI definition of OECD and IMF, FDI means that permanent interest of the person residing in another country (direct investor) on an organization in another country (Duce, 2003: 2). What is meant by permanent interest is the establishment of a long-term relationship between the investor and the organization and This relationship may also include the investor having a say in management of organization.

Dunning (1994) states that there are several factors underlying the increase in FDI. These factors can be listed as the acceleration of the transition to the liberal market economy, economic globalization, the movement in welfare assets, the better understanding of the benefits of such investments by governments and the implementation of supportive policies in this context, and the increase in the number of countries in the development phase.

Studies in the literature implies that FDI affects economic growth positively (Baiashvili and Gattini, 2020: 2). Because while foreign direct investment stimulates growth in macroeconomic terms, it increases total factor productivity. In a more general statement, it can be said that it provides more efficient use of resources in the country where capital has entered. This is done through three channels (OECD, 2002: 9). The first is realized through the effect of FDI on foreign trade. Investments contribute to trade between the capitalist country and the country where the capital enters, thereby increasing the possible export volume.

The second concerns the business sector. Investments have a positive effect with the spillover effect in different business sectors within the country, causing positive externalities. The third channel works on a positive impact on the structural factors in the country of investment.

The degree of positive effect of foreign direct investment on economic growth is related to the absorption capacity of the country. This capacity is determined by human capital development, economic, political and social environment, financial influence and degree of development and institutional quality (Baiashvili and Gattini, 2020: 3). The improvement in all these factors increases the stimulating effect of investments on economic growth.

On the other hand, there are few studies implying that direct foreign capital investments have negative effects on countries. It is claimed that the investments of multinational companies especially in developing countries have a negative impact on the development of local firms and have a negative impact on economic growth by preventing local firms' development. (Agrawal, 2005: 94). This situation is called crowding out effect in the literature. Schoors et al. (2001), on the other hand, mentioned the negative effects of foreign direct investment in the early stages of the transition process and included the term "market stealing". The authors stressed that foreign firms are more productive and more competitive than local firms, and the entry of a foreign firm into the market may result in the local firm leaving the market.

Dunning and Lundan (2008) define the motivations behind foreign direct investment in four groups. In the first group, there are physical resources such as underground resources, the existence of cheap and qualified workforce, technology, managerial and marketing capacity and

organizational skills. There are market search activities in the second group. In this group, in foreign economies that import high amounts, foreign direct investments are made to overcome trade barriers such as tariffs and quotas. In the third group, there are those seeking strategic assets that invest abroad in certain strategic assets to increase their future competitiveness. In the last group, Dunning and Lundan (2008) talk about investments to avoid restrictive legislation or macro-organizational policies and investments to support related businesses.

Kar and Tatlisoz (2008) classify the factors that affect the investment of FDI into two as driving and attractive factors. Driving factors are the factors that cause capital to be directed to different countries due to economic developments in the outside world. As an example, regional trade agreements, the decrease in profitability rates in developed countries' markets. It is possible to define attractive factors as features in the local economy, such as tax rates, financial incentives, exchange rate strategies, economic stability, bureaucratic structure, abundance of natural resources, cheapness of labor force, technological development, financial freedom and lack of capital flows.

It is also possible to classify foreign direct investments into two vertically and horizontally. Horizontal direct foreign capital investments can be defined as the investment made by a company operating in the same industry branch outside of the country where the investment will be made. In this case, the company may want to take advantage of entering a new market (Almfraji and Almsafir, 2014: 207). These types of investments are also called as foreign direct investments looking for markets (Coskun, 2001: 111).

Vertical direct foreign capital investments are also referred to as direct foreign capital investments seeking efficiency (Coskun, 2001: 110), especially for economies with low-wage workforce, are made for labor-intensive production and products are sent to countries with high wages (Ozcan and Arı, 2010: 72).

In this study, the effect of FDI on transition economies is examined. While doing this, recently developed methods of panel data methodology are used. The countries analyzed in the study are subjected to foreign direct investments of western developed countries. The investigation of possible effects of investments can be useful for theoretical inferences. In this

context, the econometric methods applied can give results on both country group and country basis, which may enable more clear results. In the light of these explanations, it is thought that the study will contribute to the literature because of the second period of transition economies, the post-2007 period and the panel data methods used.

In the next section, detailed information about the countries discussed is given. This information is about the amount and trend of FDI as well as the transition process of the countries subject to the analysis.

In the third section of the study, related literature is reviewed. In the fourth section, model and data employed are presented. In the fifth section, empirical findings are discussed. In the last section, policy implications will be made in the light of empirical findings.

2. Transition Economies and Foreign Direct Investments

The concept of transition economy is generally used for countries that switch from command economy to free market economy. While this process still continues, the term transition economies is used for twenty-five countries (Bal, 2004: 155). These countries are generally members of Central and Eastern Europe and the Baltic states and the Union of former Soviet Socialist Republics.

The IMF (2000) basically mentions four topics in the transition process. These are liberalization, macroeconomic stability, privatization, and structural and institutional reforms. Undoubtedly, an important part of the transformation process under these topics is foreign capital movements. There are many factors that attract foreign investors to these countries. Foreign capital inflows have been experienced for the purpose of privatization and liberalization, with the absence of private sector in many sectors in transition economies.

When the movements of foreign capital movements are analyzed on a country basis, it is possible to see that there are many factors that directly affect foreign capital inflows. This situation can be seen when the transition economies are examined. For example, in Poland, which has the highest investment in transition economies, the transition to a free market economy has provided political stability from the beginning, and its commitment to the understanding of free market economy has created

an attractive environment for foreign capital. In addition, low inflation, the relative size of local markets, four times lower labor costs compared to Western European countries and the presence of skilled labor encouraged capital inflows (Torrisi et al., 2009: 7).

A similar situation applies to the Czech Republic. According to Pavlinek (1998), foreign direct investments meet capital requirements, also caused an increase in human capital. It also supports the technological development by ensuring the accumulation of industrial knowledge.

When the Hungarian economy is analyzed, it is seen that capital came from West European countries, Germany, the Netherlands, France, Ireland and the United States, and South Korea to invest. While initial foreign direct investments are focused on low value added products such as textile, in 2019, the state's new support policies on foreign capital inflows have allowed high-tech production investments, such as electric cars, to enter the country (UNCTAD Access date: 19.12.2019). With the new policy strategy, the direct foreign capital stock, which was around 80 billion US dollars in 2016, reached 89 billion dollars at the end of 2019.

According to the OECD (2017) report, FDI are very important for the Slovakia economy. According to the report, 45% of the economic size depends on foreign markets and in this respect, a significant part of its foreign trade belongs to Germany. Moreover, 20% of private sector employment depends on FDI. According to the data of UNCTAD (2020), foreign direct capital stock in Slovakia economy is more than 57 billion USD.

Although the Slovenian economy is a small country compared to other transition economies, as of 2018, the foreign capital stock of 17 billion US dollars constitutes one third of the country's gross domestic product. In this respect, foreign capital investments are economically important in Slovenia. On the other hand, the country is attractive for foreign direct investments. According to the World Bank's "Doing Business", the developed infrastructure, the strategic position of the country on the coast of the Adriatic Sea, well-educated human capital is among the factors that increase the attraction of the country.

According to the World Bank's "Doing Business", another transition economy, Romania, owns a cheap and qualified workforce, tax advantages, geographical location and perhaps a major local market, which is the most important factor. the country has been in focus. According to UNCTAD data, by the end of 2019, Romania has a foreign capital stock of 94 billion USD. Almost 20% of these investments were made in the construction and real estate sector.

On the other hand, Bulgaria performed poorly in terms of FDI, especially in the first years of the transition period. In the period between 1986 and 1996, there was only a direct foreign capital inflow of 890 billion USD. It is possible to say that there are insufficient reforms related to the transition process, that is why economy performed poor performance in the related period (World Bank database, Access date: 29.12.2019). As a result of the agreement made with the IMF in 1997, together with the economic stability, for the first time in 2000, there was an annual foreign capital investment in Bulgaria over a billion dollar.

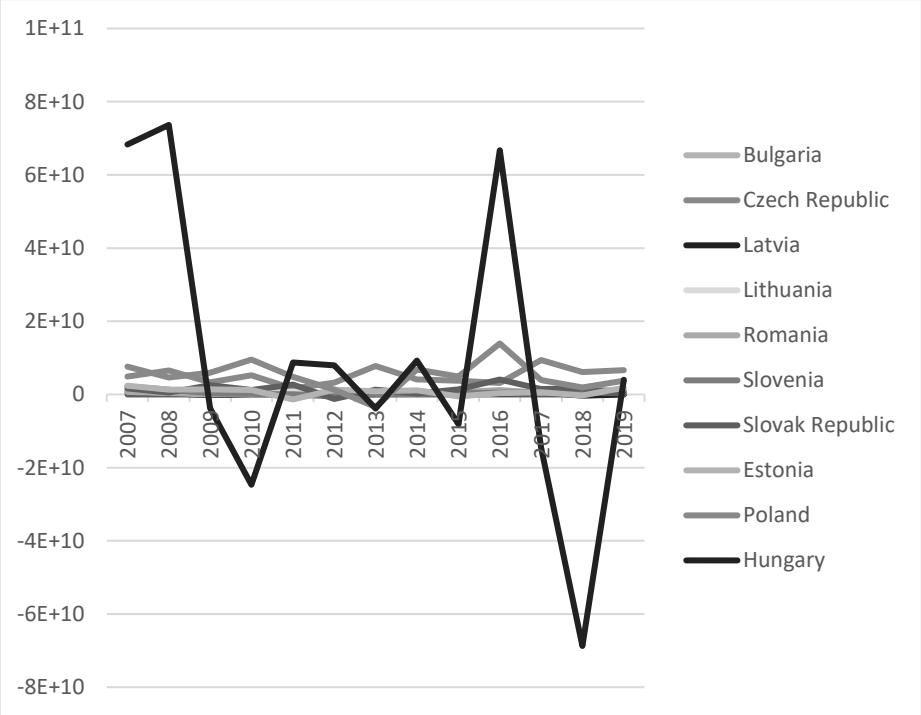
According to the World Bank's "Doing Business Report", Estonia, which has a favorable environment for FDI in green industries, information technologies and biotechnology, shows a successful performance in the transition process via balanced budget, free trade regime, fully convertible exchange rate regime and competitive banking system. According to the OECD (2017) report, foreign direct investments constitute 38% of the private sector's job creation capacity. Almost half of the private sector's employment capacity is formed by foreign capital investments. According to UNCTAD (2019) data, the foreign capital stock of the country has increased in recent years and reached 24 billion USD.

Graph 1 shows the movements of FDI in the period analyzed. Accordingly, it can be said that the performances of the countries investigated are similar, and there are serious fluctuations in the foreign direct investment stock in the Hungarian economy. Slovakia economy, on the other hand, is observed to be in second place after Hungary in the context of highest foreign direct investments.

It is possible to say that transition economies attract foreign direct investments regularly and global crises affect the countries in a similar way in the context of foreign direct investments. Also, when the data of

UNCTAD is examined, it will be possible to say that origin of the capital coming to these countries is similar. These countries are generally Western European countries, mainly Germany, Austria, France, Italy, Netherlands and UK. In addition, the United States, Japan and South Korea are among these countries. This shows that geographical proximity is an important factor in capital inflows to transition economies.

Graph 1: FDI in Transition Economies ($)



Source: World Bank, Economic Indicators Database (Access date: 10.06.2020).

3. Review of Literature

When the studies examining the effect of foreign direct investments on economies are analyzed especially with the liberalization process in the 1990s, it increased significantly. It is seen that these studies have focused on different sectors of the economy, such as the financial system and the manufacturing industry, as well as examining the effects of the economy on macro indicators such as growth and unemployment. The current

literature focuses more on the economies of developing countries, and panel data methods are used as an empirical method, which enables collective analysis of country groups.

When these studies are classified, results are obtained that many of them are proof of positive relationship, and few studies show that there is no relationship or negative relationship. Since there is a large literature in this study, only the studies analyzing related countries and results of them will be summarized.

While studying the Polish economy in his study, Konings (2001) finds that there is no relationship between FDI and economic growth for the period 1993-1997. In the study of Konings, it is also stated that this relationship has negative consequences for the Romanian and Bulgarian economies because current imbalances, monopolistic structures and reverse technology transfers have taken place.

Campos and Kinoshita (2002) examine the relationship between FDI and economic growth for twenty-five Central and Eastern Europe and the member states of the former Union of Soviet Socialist Republics in the period 1990-1998. As a result of the analysis of the authors, it is determined that FDI positively affect economic growth for each country. This result seems to be compatible with theoretical explanations.

Aleksynska et al. (2003) examined the effect of foreign direct investment on economic growth in the Ukrainian economy, which is one of the transition economies. At the end of their study, the authors conclude that foreign direct capital stock indirectly affects economic growth, not directly, and that this indirect impact is reflected on the economy through human capital.

Lee and Tcha (2004) use cross-sectional and panel data analysis in their studies in which they examine the transition countries in Baltic and Eastern Europe in the context of foreign capital. As a result of their work, the authors conclude that they had positive effects such as increasing total factor productivity, getting rid of falling into the trap of poverty of the relevant countries, and a positive effect on economic growth in total.

Lyroudi et al. (2004), on the other hand, examined the effects of foreign investments on growth, which entered into economies between the years

of 1995 and 1998 in seventeen transition economies. The authors conducted a country-based analysis in their work, but concluded that FDI had no impact on economic growth for all countries.

Cristina and Rati (2005) use data from 1991-2002 period and panel data analysis methods in their study examining the relationship between variables for twelve Eastern European countries. As a result of the analysis of the authors, they conclude that FDI have a strong and positive effect on the economies under consideration.

Titarenko (2005) examines the Latvian economy in the context of the economic growth of foreign direct investment. As a result of his analysis, Titarenko states that FDI prevent domestic investments and thus the "crowding out effect" is valid.

Stanisic (2008), in his study of Eastern European transition countries, contendes that contrary to theoretical explanations, FDI have no positive effect on the economy.

Another study that examines the Romanian economy belongs to Roman (2012). In his novel, he states that there is a positive correlation between FDI and economic growth between 1995 and 2004, and this interaction is based on capital stock.

Melnyk et al. (2014) examine the economic impact of foreign direct investments in twenty-six COMECON transition countries in their studies. The authors using panel data analysis methods have reached the result that foreign capital investments positively affect economic growth in the 1998-2010 period.

Miteski and Stefanova (2017) test the relationship between FDI and economic growth for sixteen countries in Central, Eastern and Southeastern Europe. Panel data analysis results show that foreign capital investments had a positive effect on economic growth in between 1998 – 2013 period, moreover, investments in industry and service sectors affect economic growth more.

As can be seen, the current empirical literature does not reach a clear conclusion on how effective the relationship between FDI and economic growth is in transition economies. The main reason of the differences

among studies come from period, empirical method and countries included into panel data models.

Panel data methods, which especially provide group statistics, may miss country-specific results. Moreover, while the relationship was weak in the early stages of the transition period, the relationship may have accelerated in the later periods. In the light of all these explanations, the use of panel data method, which can provide country-specific results in this study, and the period after the transition to the European Union, which constitutes the second part of the transition process, shows the contribution of the study to the empirical literature.

4. Model and Data

In this study, Central and Eastern European countries are analyzed. These are Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia which are joined into European Union in 1th of May 2004, called first wave, and Romania and Bulgaria which are joined into European Union in 1th of January 2007, called second wave. The empirical analysis period covers annual data from 2007, when transition economies joined the European Union as a whole, until 2018.

In the analysis, gross domestic product per capita (GDPPC, hereafter) is employed suggested by Aisen and Veiga (2013), Szkorupová (2014) and Almfraji and Almsafir (2014). Similarly, foreign direct investment (FDI, hereafter) is employed suggested by Bengoa et al. (2003), Azman-Saini et al. (2010) and Iamsiraroj (2016). Data belonging to both variables are obtained from World Bank. So, model with two variables is built for empirical analysis.

The common feature of the transition economies that make up the panel is that they switch from the central planning economy to the free market economy within the framework of the European Union harmonization process. For this reason, there is an issue of being affected by each other in the process of economic transformation. In empirical analysis, this situation is referred to as the cross-sectional dependency. For this reason, it is necessary to use test methods that examine whether there is a cross-section dependency among economies. In section dependency, the basic hypothesis is that transition economies have no effect on each other, and

the alternative hypothesis is that transition economies have an effect on each other.

Table 1: Cross Section Deendency Test Results

Model with constant	**FDI**	**GDPPC**
CD_{lm} (BP,1980)	106.757 (0.00)[a]	77.430 (0.00)[a]
CD_{lm} (Pesaran, 2004)	6.51 (0.00)[a]	3.418 (0.00)[a]
CD (Pesaran, 2004)	-0.601 (0.274)	-1.703 (0.044)[b]
LM_{adj} (PUY, 2008)	21.112 (0.00)[a]	14.702 (0.00)[a]

$$\Delta y_{i,t} = d_i + \delta_i y_{i,t-1} + \sum_{j=1}^{p_i} \lambda_{i,j} \Delta y_{i,t-j} + u_{i,t}$$

Note: In model, , number of lag (p_i) is accepted as 1. Symbols, a, b and c present that alternative hypothesis is accepted in significance levels 1 %, 5 % and 10 %, respectively.

In the decision phase of the horizontal cross-section dependency test, probability values are used. If probability values are less than 1%, 5%, and 10% significance levels, the alternative hypothesis that transition economies have an impact on each other is accepted. Conversely, if the probability values are greater than 1%, 5% and 10% significance levels, the basic hypothesis that transition economies have no effect on each other is accepted. Except CD test developed by Peseran (2004), cross section dependency tests results show that it is accepted the alternative hypothesis that transition economies have an impact on each other. For this reason, second generation unit root tests must be applied.

In order to apply the PANIC panel unit root test developed by Bai and Ng (2004), there should be dependency in horizontal sections. In the PANIC panel unit root test, the null hypothesis is that the variable contains unit root and the alternative hypothesis is that the variable does not contain the unit root. Probability values are used in the decision phase. If the probability values are less than 1%, 5% and 10% significance levels, the alternative hypothesis that FDI and GDPPC variables are not affected by economic crises is accepted. On the contrary, if the probability values are

greater than 1%, 5% and 10% significance levels, the null hypothesis is that the variables of FDI and GDPPC are affected by economic crises.

Table 2: PANIC Panel Unit Root Test Results

	Model with constant		Model with constant and trend	
Level	**Test Stat.**	**Prob. Values**	**Test Stat.**	**Prob. Values**
FDI				
$Z_{\hat{e}}^{c}$	2.1542	0.0156[b]	6.957	0.00[a]
$P_{\hat{e}}^{c}$	33.6242	0.0288[b]	64.0002	0.00[a]
GDPPC				
$Z_{\hat{e}}^{c}$	5.7838	0.00[a]	7.9246	0.00[a]
$P_{\hat{e}}^{c}$	56.5798	0.00[a]	54.9482	0.00[a]

Note: $P_{\hat{e}}^{c}$ is a Fisher type statistic which takes individual ADF test probability values into account. $Z_{\hat{e}}^{c}$ is a Choi type statistics standardized for large N samplings. Maximum common factor number is accepted as 2. the symbols a, b, and c show that the alternative hypothesis is accepted at 1%, 5% and 10% significance levels, respectively.

When the test results are analyzed, the variable of FDI is stable at the level value of 5% in the model with constant, and 1% in the model in which the constant term and trend variable is included. The per capita gross domestic product variable is stationary in the model in which the level value includes both constant and constant term and trend variable. This is thought to have arisen since the empirical analysis period started after the transition economies' membership to the European Union. Because with the help of the Union's common economies policies, transition economies with low per capita income converge to member countries where income per capita is high, resulting in mass economic shocks.

Table 3: Cross Section Dependency and Homogeneity Test Results

	Statistic	Prob. Value
Cross Section Dependency		
LM **(BP,1980)**	82.022	0.00[a]
CD_{lm} **(Pesaran, 2004)**	3.902	0.00[a]
CD **(Pesaran, 2004)**	6.076	0.00[a]
LM_{adj} **(PUY, 2008)**	4.937	0.00[a]
Homogeneity Tests		
$\tilde{\Delta}$	13.898	0.00[a]
$\tilde{\Delta}_{adj}$	15.791	0.00[a]

Note: In the regression model $FDI_{it} = \alpha_i + \beta_{1i} GDPPC_{it} + \varepsilon_{it}$, the symbols a, b, and c show that the alternative hypothesis is accepted at 1%, 5% and 10% significance levels, respectively.

In the model $FDI_{it} = \alpha_i + \beta_{1i} GDPPC_{it} + \varepsilon_{it}$, FDI are dependent and GDPPC is independent variable. The *i* index shows the cross sections that form the panel. It is necessary to test whether the parameters of cross sections are equal each other in the regression obtained and in the co-integration test to be used later. Because when comparing economies such as Estonia and Latvia, which are among the countries that form the panel, and Romania and Bulgaria, which are relatively larger countries, the fact that the slope parameters of the regression are the same will cause errors in policy inferences.

In the homogeneity tests, the basic hypothesis is that the slope parameters of the countries forming the panel are the same. The alternative hypothesis is that the slope parameters of the countries that form the panel are different from each other. According to Table 3, where the probability values are included, the alternative hypothesis is accepted and therefore, it is concluded that the slope parameters of the countries forming the panel are different from each other. For this reason, in choosing the co-

integration method used to determine long-term relationships, methods that take cross section dependency into account should be used.

Table 4: Panel Co-integration Test Results Considering Cross Section Dependency Results

	Constant			**Constant and Trend**		
	Stat.	Asymptotic Prob. Value	Bootstrap Prob Value	Stat.	Asymptotic Prob. Value	Bootstrap Prob Value
Error Correction						
Group_tau	-43.555	0.00[a]	0.016[b]	-50.662	0.00[a]	0.345
Group_alpha	-8.922	0.00[a]	0.00[a]	-2.233	0.013[b]	0.19
Panel_tau	-24.031	0.00[a]	0.00[a]	-12.334	0.00[a]	0.247
Panel_alfa	-18.962	0.00[a]	0.00[a]	-7.916	0.00[a]	0.043[b]

Notes: The null hypothesis claims that there is no co-integration. In the error correction test, the lag length is considered one. The probability ratio obtained with the bootstrap method is obtained from 1,000 repetitions.

Asymptotic probability ratios are obtained from the standard normal distribution. The symbols a, b, and c show that the alternative hypothesis is accepted at 1%, 5% and 10% significance levels, respectively.

In the co-integration test, the basic hypothesis is based on the claim that there is no long-term relationship between FDI and GDPPC and hence there is no co-integration. The alternative hypothesis, on the other hand, claims that there is a long-term relationship and thus co-integration exists between FDI and GDPPC. Probability values are used in the decision phase. If the asymptotic and bootstrap probability values are less than 1%, 5% and 10% significance levels, an alternative hypothesis is accepted that claims a long-term relationship between FDI and GDPPC. Conversely, if the asymptotic and bootstrap probability values are greater than 1%, 5% and 10% significance levels, the null hypothesis is assumed that there is no long-term relationship between FDI and GDPPC.

The null hypothesis that there is no long-term relationship between FDI and GDPPC is accepted, since the bootstrap probability values in the

model in which the constant and trend variable are included are greater than at least 10% significance level. However, the asymptotic and bootstrap probability values of the constant term model and the asymptotic probability values of the constant term and trend variable model (excluding group alpha statistics) lead to the conclusion that there is a long-term relationship between FDI and GDPPC.

Table 5: Panel VAR and VECM Causality Test Results

	Short Term Causality		**Long Term Causality**
	Δ (FDI)	**Δ (GDPPC)**	**ECT(-1)**
Δ (FDI)	-	1.873 (0.171)	-1.288 [-12.199][a]
Δ (GDPPC)	1.356 (0.244)	-	1.38E-07 [1.773][c]

Note: The symbols a, b, and c show that the alternative hypothesis is accepted at 1%, 5% and 10% significance levels, respectively. () presents probability values and [] presents t statistics.

Vector autoregression (VAR) and error correction model (VECM) which are time series analysis methods are modified for panel data analysis and results are presented in the table 5. In the panel vector error correction model, the short-term causality among the variables and the statistical significance since the error correction coefficient is different from zero means long-term causality. In the vector autoregression and error correction model, the null hypothesis shows that there is no causality from direct FDI to GDPPC or vice versa, to direct foreign capital investments from gross domestic product per capita. The alternative hypothesis shows that there is causality from direct FDI towards GDPPC, or vice versa, from GDPPC to FDI. Probability values and t statistics are used in the decision phase.

According to the results in table 4, in the panel vector error correction model, it is found that there is no causality in the short term, from direct foreign capital investments to gross domestic product per capita or from direct domestic capital to direct foreign capital investments. However, according to the panel vector error correction model, there is causality in

the long run from direct foreign capital investments to per capita gross domestic product or vice versa.

Table 6: Canning and Pedroni (2008) Panel Causality Test Results

Country	**FDI≠>GDPPC**		**GDPPC≠>FDI**	
	t stat	Prob Value	t stat	Prob Value
Bulgaria	-0.864	0.420	1.209	0.271
Czech Republic	-1.797	0.122	1.260	0.254
Latvia	-0.660	0.533	0.341	0.744
Romania	0.737	0.488	-1.656	0.148
Slovak Republic	-2.205	0.069[c]	0.691	0.515
Slovenia	-3.376	0.014[b]	0.243	0.815
Lithuania	-0.232	0.824	0.409	0.696
Hungary	-2.862	0.028[b]	-0.393	0.707
Estonia	-0.547	0.603	-0.260	0.803
Poland	-0.393	0.707	-0.264	0.800
Lambda Pearson	**31.553**	**0.048[b]**	**13.779**	**0.841**

Note: The symbols a, b, and c show that the alternative hypothesis is accepted at 1%, 5% and 10% significance levels, respectively.

The causality test results obtained in the panel vector autoregression and panel error correction model provide policy implications for all the countries that form the panel. However, there may be social and economic differences for the countries that form the panel. With the causality test developed by Canning and Pedroni (2008), it can give an idea about the existence of a causal relationship between FDI and GDPPC and the direction of the possible relationship for each country that constitutes the panel.

According to the results in table 6, there is a causality in Slovak Republic at 10% significance level, in Slovenia and Hungary at 5% significance level, from FDI to GDPPC. Causality from direct FDI to GDPPC is not an issue in other countries. The results of Canning and Pedroni (2008) causality test also show that there is no causal relationship from GDPPC to FDI in any countries.

5. Results and Conclusion

Foreign direct investment is important, especially for economies that are in the early stages of development, both because they meet their capital factor needs and increase their total factor productivity. There are many studies in the literature that examine the relationship between foreign direct investment and economic growth.

"Transition economies", which are located in Central and Eastern Europe, and which focus on the free market economy from communist understanding, are among the countries with the highest foreign direct capital inflow. In this study, the relationship between economic growth and foreign direct investment in the economies of Bulgaria, Czech Republic, Latvia, Romania, Slovak Republic, Slovenia, Lithuania, Hungary, Estonia and Poland, which are accepted among transition economies, is examined for the period between 2007 and 2018.

Although data for the countries under consideration were available until the 1990s, January 1, 2007, which is the accession date of many countries to the European Union, is considered the beginning of the second phase of the transition period of the countries. Therefore, the analysis period starts from 2007.

The results of the analysis show that there is no short-term causality in the country group analyzed, and there is no uni-directional relationship from direct foreign direct investments to economic growth as well as from economic growth to direct foreign investments. On the other hand, the error correction model results that show that the relationship between the variables in the long term is statistically significant. This shows that foreign direct investments are effective on the economy in the long run. When the results are evaluated theoretically, it can be said that they are theoretically meaningful. Because the effects of the investments on the economy will appear only after a certain time. The absence of any

causality from economic growth to the amount of foreign direct capital indicates that foreign investors make investments by considering different variables rather than economic magnitude.

On the other hand, results of country-based analysis show that there is a causality from foreign direct investment to economic growth in only three countries. These countries are Hungary, Slovenia and the Slovak Republic. When the relationship of these countries with foreign capital is examined, it is seen that foreign capital is important especially in the Republic of Slovakia and that foreign capital has a very important place in employment and GDP. While the size of the economy is 105 billion US dollars, foreign capital stock is at the level of 57 billion dollars. In this context, the emergence of causality in the Slovak Republic seems economically meaningful as well as statistical.

The Hungarian economy is among the countries with the highest capital stock among the transition economies with a foreign capital stock of nearly 100 billion US dollars. On the basis of this, it is possible to estimate that the policies supporting the foreign capital implemented by the Hungarian government have been influenced in recent years. In addition, the capital's orientation towards high-tech areas may increase the direct dependence on foreign capital in the new economic structure.

When the Slovenian economy is analyzed, it is possible to conclude that the foreign capital stock corresponds to one third of the country's economy, therefore foreign direct investment can have an impact on economic growth even in the short term.

Finally, it is possible to say that foreign direct investments are higher in transition economies than in other developing countries. However, the fact that the incentive policies implemented by the governments of the countries to attract foreign capital are effective can be seen in the example of Hungary.

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Waqf Company: Concept, Rulings and The Practice in the Kingdom of Saudi Arabia

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ABSTRACT

Waqf company is a new concept in the waqf. It is different from the conventional waqf that is based on real estate and plantations. It is also different from the cash waqf. Due to this, the purpose of this paper is to study the concept of waqf company, try to define it, and establish how it works through the use of the Saudi Arabian practice as a reference point. This research adopted a qualitative research method, using content analysis of the secondary literature from both classical and contemporary jurists and legal experts' opinions. Some of the major findings are the definition of a waqf company whose shares are all waqf. It also found that a company does not become a waqf company because of having few shares declared as waqf by their owners. In terms of incorporation, waqf company can take any form of business entity that could be used as a vehicle for commercial activities. The limitation of the research is that there is little literature because the topic is still new. The research presents a practicable concept of the waqf company. To prove this, there is a need to establish a business entity so that the assets and the shares are declared as waqf so that the dividends will be benefiting the designated beneficiaries. The research has a social implication, considering waqf as an Islamic social fund. It will help policymakers further push for adequate laws and regulations that will strengthen the operationality and efficiency of waqf company, thereby significantly reducing poverty and creating jobs through employment by the waqf company. The research is one of the few research pieces that have been conducted in this field as there is a shortage of literature till the current time. Thus, the research will contribute to the efforts being asserted towards understanding the concept of waqf company.

ملخص

تعتبر الشركة الوقفية مفهوما جديدا في مجال الوقف. وهي تختلف عن الوقف التقليدي القائم على العقارات والمزارع. كما أنها تختلف عن الوقف النقدي.ونتيجة لذلك، فإن الغرض من هذا المقال هو دراسة مفهوم الشركة الوقفية، ومحاولة تعريفها، وتحديد كيفية عملها من

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خلال استخدام الممارسة السعودية كنقطة مرجعية. اعتمد هذا البحث أسلوب البحث النوعي، باستخدام تحليل محتوى الأدبيات الثانوية من كل من الفقهاء الكلاسيكيين والمعاصرين وآراء الخبراء القانونيين. ومن بعض النتائج الرئيسية هو تعريف الشركة الوقفية بتلك التي تكون جميع أسهمها وقفية. كما وُجد أن الشركة لا تصبح شركة وقفية بسبب قلة الأسهم المعلنة كوقف من قبل أصحابها. ومن حيث التأسيس، يمكن لشركة وقفية أن تتخذ أي شكل من أشكال الكيانات التجارية التي يمكن استخدامها كوسيلة للأنشطة التجارية. وتتمثل التحديات التي واجهها هذا البحث في وجود القليل من الأدبيات بخصوص الموضوع كونه لا يزال ناشئا. وإن البحث يقدم مفهوما عمليا عن الشركة الوقفية.ولإثبات ذلك، هناك حاجة إلى إنشاء كيان تجاري بحيث يتم الإعلان عن الأصول والأسهم كوقف حتى تعود أرباح الأسهم بالفائدة على المستفيدين المحددين. ويتميز البحث بتأثير اجتماعي، حيث يعتبر الوقف صندوقا إسلاميا اجتماعيا.وسيساعد صناع السياسات على وضع المزيد من القوانين واللوائح المناسبة التي من شأنها تعزيز فعالية وكفاءة الشركة الوقفية، وبالتالي الحد بشكل كبير من الفقر وخلق فرص عمل من خلال التوظيف من قبل الشركات الوقفية. ويعتبر البحث إحدى الدراسات البحثية القليلة التي أجريت في هذا المجال حيث يوجد نقص في الأدبيات حتى الوقت الحالي. وبالتالي، فإن البحث سيساهم في الجهود المبذولة نحو استيعاب مفهوم الشركة الوقفية. الكلمات الدلالية: شركة وقفية، الأوقاف المادية، الأوقاف الاستثمارية.

ABSTRAITE

L'entreprise Waqf est un nouveau concept dans le waqf. Il est différent du waqf conventionnel qui est basé sur l'immobilier et les plantations. Il est également différent du waqf de l'argent liquide. De ce fait, l'objectif de ce document est d'étudier le concept de société waqf, d'essayer de le définir, et d'établir comment il fonctionne en utilisant la pratique saoudienne comme point de référence. Cette recherche a adopté une méthode de recherche qualitative, utilisant l'analyse de contenu de la littérature secondaire à partir des avis de juristes et d'experts juridiques classiques et contemporains. Parmi les principales conclusions, on peut citer la définition d'une société waqf dont les actions sont toutes waqf. Elle a également constaté qu'une société ne devient pas une société waqf parce qu'elle a peu d'actions déclarées comme waqf par leurs propriétaires. En termes de constitution, la société waqf peut prendre toute forme d'entité commerciale qui pourrait être utilisée comme véhicule pour des activités commerciales. La limite de la recherche est qu'il y a peu de littérature parce que le sujet est encore nouveau. La recherche présente un concept praticable de l'entreprise waqf. Pour

le prouver, il est nécessaire d'établir une entité commerciale afin que les actifs et les actions soient déclarés comme waqf de sorte que les dividendes profitent aux bénéficiaires désignés. La recherche a une implication sociale, considérant le waqf comme un fonds social islamique. Il aidera les décideurs politiques à faire pression en faveur de lois et de réglementations adéquates qui renforceront l'opérationnalité et l'efficacité de la société waqf, réduisant ainsi de manière significative la pauvreté et créant des emplois grâce à l'emploi par la société waqf. Il s'agit d'une des rares recherches qui ont été menées dans ce domaine car il y a une pénurie de littérature jusqu'à présent. Ainsi, la recherche contribuera aux efforts qui s'affirment pour comprendre le concept d'entreprise waqf.

Keywords: Waqf company, tangible Awqāf, investment waqf.

JEL Classification: D64, G23.

1. Introduction

Waqf is one of the greatest acts of monetary devotion and expression of heeding to Allah's call to doing charity. Its importance is further echoed by the hadith of the Prophet (peace be upon him) in which he said: "When a man dies, his deeds come to an end except for three things, and he mentioned among those three: *ṣadaqah jāriyah* (perpetual charity), knowledge by which people derive benefit and a pious son that prays for him (Muslim, n. d, vol. 3: 1255, hadith no. 1631). The Muslim scholars had interpreted the perpetual charity in this hadith to be referring to waqf. This is because the beneficiary of the subject matter of waqf has no legal ownership but only entitles to beneficiary ownership. It is from this perspective the perpetuity referred to in the hadith manifests. Also, the hadith of Umar Ibn Al-Khattab(May Allah be pleased with him) in which he converted his plantation in Khaybar, a province from northwest of Saudi Arabia with few miles from Madinah into waqf under the instructions of the Prophet (Peace be upon him) (Al-Bukhari, 1987, vol. 3: 198, Hadith no. 2737). This was done by other companions such as Uthman (Al-Bukhari, 1987, vol. 4: 13), and Abu Ṭalḥa (Al-Bukhari, 1987, vol. 2: 119), and the consensus is upon that (Al-Qarafi, 1994, vol. 6: 323). Awqāf (plural of waqf) is considered as one of the most important supporting institutions for the development and growth of societies in the Islamic world. Awqāf has played a prominent role in building and developing different facets of life in Islamic societies, and proofs of that are plentiful.

With the great economic development of recent times, the presence of a strong desire of businesspersons to dedicate various assets and property to *waqf,* so that the benefits be allocated to the deserving community has arisen. The need for other non-traditional forms of the *waqf* has become imperative. These forms would assist the *waqf* in achieving its objectives under the modern management of companies regulated by government agencies and in a manner that does not compromise the perpetuity of the *waqf* asset in accordance with the Shariah rulings and the jurisprudence upon which *waqf* has been established upon.

In this regard, the idea of (*Waqf* Companies in Kingdom of Saudi Arabia "KSA") was established to allow the donor to proceed with his *waqf* investment under a modern managerial concept that allows their engagement in different commercial activities, which are consistent with the objectives of waqf. There is no doubt that this new development will bring sufficient returns that will yield the anticipated benefits to society. It should be noted that KSA is not the first country to develop *waqf* companies. It has been preceded by the western counties' endowment funds. For example, the Harvard Management Company is the business entity of Harvard dedicated to managing the endowment fund of the popular university. As of today, the endowment has distributed over $28 billion to Harvard, and it is responsible for over one-third of the operating cost of the popular university (Harvard, 2020). Also, Newton Investment Management, which is a British company, managing awqāf (endowments) with a value exceeding GBP £46 Billion. Last but not least, Barclays Investment management in London: running *waqf* (endowed) assets worth GBP £164 Billion (Alzamil, 2014). These successful endowment stories can be replicated in the Muslim World in the aspect of *awqāf*.

The responsible people for establishing *waqf* companies in the Kingdom of Saudi Arabia have benefited from these experiences. An agreement has been signed between the Saudi Ministry of Awqāf and Islamic Affairs and the Ministry of Industry and Trade. This agreement assumed waqf as a legally independent entity, which allows it to obtain business certifications that grant it the status of a merchant.

This research is projecting the emergence of different forms of waqf other than the traditional types in KSA. There is no doubt that this came about because of the huge economic development witnessed by KSA and the

whole region in general. Waqf company in the current century is a revitalizing platform for the development and growth of waqf. It is transforming it from the traditional method of real estate that may or may not yield enough revenues to the beneficiaries due to the lack of flexibility in the traditional waqf properties, whereas the waqf company inherently contains flexibility.

In addition, one of the most outstanding benefits of managing waqf as a company is regulatory surveillance, like any other company. This benefit comes as a result of the management team and board of directors' seriousness to direct the affairs of the waqf company in the right direction, failure of which may attract penalty by the authority. The subject of waqf company is still relatively new, and not many countries have made law on it. But Saudi Arabia is one of the few countries that have made laws on this new development of waqf. It is therefore expedient to use the law as a case study to derive some lessons that could be used as a model by other jurisdictions. It is important to note that the practice of waqf company has long been understood in the West in the form of an endowment, which is similar to Waqf in the Shariah.

Therefore, the objectives that the research seeks to actualize are to link the foundations and principles of waqf in Islam with a company based-waqf. It will also study the concept of waqf company, the Saudi Arabian laws of waqf company, and understanding the practicality of the concept. Finally, it will contribute to reviving the spiritual rite of waqf in new ways that are compatible with modern times. Some issues that are yet to be clear on the subject matter would be made clear.

The research is divided into five sections. After the introductory section, the literature review forms section two. Section three is the methodology, while section four focuses on the study of the concept of waqf company and the jurisprudential analysis. The final section is the conclusion and findings.

2. Literature Review

There is no doubt that many researchers have written on waqf as a subject. However, the literature on waqf company has remained very inadequate due to the newness of the topic. Therefore, the literature that is directly relevant to the topic would be reviewed to the extent the author can find

them after a thorough search. Accordingly, some of the books that have focused on this area are reviewed below.

1. *Ash-Sharikat Al-Waqfiyyah* (Waqf companies) by Al-Rajihi the author studied some of the achievements of waqf companies and focused on a case study of Sulaiman bin Abdul Aziz Al-Rajhi Awqāf Holding Company.
2. Alani (2018) (conducted research on the waqf company where he arrived at the fining that waqf company could be owned by other waqf entities or shareholders that mutually agreed to endow their shares as waqf. Consequently, the company turns to waqf company.
3. Al-Kharashi, (2012) in Alani (2018) proposed a waqf company that will have the board of trustee as the one conferred with the powers to appoint the director of the waqf company. The above papers are not particularly in the same direction as the current paper, which is looking at the concept from the Saudi Arabian practice with a view to unveiling the clear picture of waqf company.
4. Al-Ahmadi, (2018) authored a book on waqf shares where he studied the Shariah point of view and arrived at the permissibility in agreement with the OIC Fiqh Academy. He further stressed that the suitability of corporate shares for waqf confirmed that the Shariah is suitable for any time and place.
5. Ramli and Jalil (2013) had delineated the features of a waqf to be waqf company, established that there are various models of waqf company, in all, he stipulated that the waqf must have artificial personality.
6. Saad et al. (2017) had tested the viability of managing waqf through registered entities of various modes. Their finding was that most respondents supported the system of waqf company why only a few were indifferent. This finding supports the purpose of the current paper that seeks to study the concept of waqf company based on the practice of Saudi Arabia.
7. Mohsin (2014) defined waqf company as "confinement of liquid money, shares, profits, dividends by founders such as individuals, companies, corporations, organizations, or institutions, and the dedication of its usufruct in perpetuity to the welfare of society"(Mohsin 2014, p. 16). This definition does not meet the criteria of a definition because it limited waqf company to liquid

assets, whereas non-liquid assets are also suitable for waqf company. This limitation further reveals that there is a gap to fill by the current paper.

8. Jamaludin (2018), in the presentation made to the Securities Commission of Malaysia and Oxford Centre Islamic Studies, asserted that waqf had become one of the Islamic Capital market instruments, providing an opportunity for the development of Islamic social finance.
9. The International Islamic Fiqh Academy in its resolution no. 181 of 2009 ruled that there is no text of the Shariah that prevents waqf of shares or Sukuk, intangible rights, usufruct, units of investment funds. This resolution is evidence that that the current topic is timely to be researched ascertain the concept of company waqf.
10. Another work that has been published on this topic is the work of Al-Muhana. The author divided waqf companies into different types based on public and private companies and concluded that waqf company could be established through Awqāf institutions or by natural persons(Al-Muhana, n.d.).

Despite the scarcity of literature in this area, the researcher was able to find the above literature, which is very relevant to the topic under investigation. However, there still exists a gap in which the current paper can fill. The gap is that the legal and *fiqhi* perspective-cum-Saudi practicing e of the concept of waqf company illuminates the understanding of this new aspect of waqf.

Furthermore, the issue of explaining the effect of waqf companies on Zakat will be addressed.

3. Methodology

The topic is a new development in the field of waqf. Unlike the real estate based waqf, which has been dominating the space of waqf. The waqf company evolved as an endowment of one's equity participation in a corporate organization. Owing to its emerging nature, there is a dearth in its literature. However, in order to get a new concept clear, the research will use qualitative research method, using content analysis of relevant documents. The status of the topic as new development necessitates that interview would be conducted with the practitioners of waqf companies so that the conceptualization and the modus operandi would be clear.

Thus, while the study is theoretical in nature, it also contains some elements of empirical inquiry. Hence, the researcher interviewed a notable institutional trustee of Sulaiman bin Abdul Aziz Al-Rajhi Awqāf Holding Company. This served as a means for investigating some practices based on modern rulings and newly developed procedures.

On the other hand, the researcher would also rely on relevant literature from the books of Islamic jurisprudence, the relevant laws of the Kingdom of Saudi Arabia, *Fatāwā* of reputable Islamic organizations and scholars.

4. The Concept of Waqf Company

df This section will study the concept and meaning of the waqf company from the fiqhi perspective, the Saudi Law, and experiences on waqf company. It will also look at the obligation of Zakat on waqf company, whether it is obligatory on the company based on the current practice of imposing Zakat on business corporations.

4.1. Definitions of Waqf Companie

Before defining the waqf companies, it is necessary to mention the definitions of modern companies first. This is to investigate from both legal and Islamic jurisprudence point of view whether any type of legal entity used as a commercial company can actualize the objectives of waqf without violating the Shariah rules on waqf. Thus, the following are types of companies and their definitions:

4.1.1. Investment Companies:

Companies that rely on the capital from the partners for their establishment with no regard to the independent person for each investor and its shares are tradable. This type of company is divided into:

i. Stock Company: a company or whose capital is divided into tradable equal shares whereby every partner is liable to the extent of his shares in the capital(AAOIFI Shariah Standard, 2017, p. 338). For the purpose of waqf, the majority of the jurists, Abu Yusuf, al-Shāfiʿī, Ahmad Ibn Ḥanbal and Malik permitted establishing what is referred to as waqf *mushāʿah* (undivided shares) (Al-Kasani, 1986, vol. 6: 220; Ibn Qudāmah, 1968, vol. 6: 37). Based on this ruling, it is

permissible to establish this type of company as waqf. The process would be that after the promoters of the company have registered it, they will then invite members of the public to subscribe to the shares and give them as waqf with or without any new intention. This is because if the promoters have made it clear from the onset that this is a waqf company, the intention of the subscribers will follow suit.

This will mean that the shares would not be traded on the secondary market because you cannot sell the corpus of waqf, which are now the shares of the company. The only way-out to sell the shares would be through istibdal, which is selling the corpus of waqf to use the proceeds to buy another asset to replace the sold one.

ii. Company Limited by Shares: a company whose capital is tradable shares. In which partners are two categories: joint participants, who are liable in a complete sense and have joint liability on company debts. On the other hand, the silent partners have liability that is limited to their shares of the capital AAOIFI Shariah Standard, 2017, p. 344-5). To use this type of company for waqf, we need to weigh between the *maṣlaḥah* (interest) and the *mafasadah* (harm) of having the partners liable jointly. If the liabilities are more than the asset, the partners risk being declared bankrupt, and consequently, the waqf company would come to an end. Nevertheless, it may be better to use this type as temporary waqf so that the risk of becoming bankrupt will be very limited because it is not a long term waqf.

iii. Limited Liability Company (LLC): a company whose capital is owned by a limited number of partners not exceeding a fixed number (which varies based on different laws). Every partner's liability is limited to their shares of the capital. The shares of this type of company are not tradable(Corporate Finance Institute, 2015). This company is suitable for both permanent and temporary waqf because it does not pose any danger to the personal property of the partners, but rather on the waqf assets in the company would be claimed by the creditors if the legal reason arises.

4.1.2. Partnership Companies

Companies are established by persons who are independent by themselves, and they know and trust each other. Partnership companies are divided into:

i. Joint Liability Company: a company that is assigned to two or more people involved for the purpose of business or enterprise. They split the capital between them, and each one is liable personally and jointly in all their funds to the creditors. This structure depends, basically, on the personal network between partners. Juristically speaking, there is nothing in Shariah to prevent using this type of company for waqf except if the risk is very high, then the *maṣlaḥah* and *mafsadah* would be the determinant factor.

ii. Limited Partnership Company (LP): is a partnership made up of two or more partners. The general partner oversees and runs the business, while the limited partners do not partake in managing the business. However, the general partner has unlimited liability for the debt, and any limited partners have limited liability up to the amount of their investment (Corporate Finance Institute, 2015). The same rules mentioned in the preceding one also apply to this.

iii. A joint venture (JV) is a dummy company that has no legal identity. In a joint venture of two or more parties, each has a share in the capital. Each of the participants is also responsible for profits, losses, and costs generated from commercial and business activities they participate in or conducted by one of them individually. Liability is limited upon the right of working therein(AAOIFI Shariah Standard, 2017, Standard no. 12). To use this as waqf, there must be a written document to that effect because the company is not registered, but it is permissible to register it as waqf based on the terms and conditions given by the partners that use it as waqf.

iv. Holding Company: A company that owns stocks, or shares in the capital of other independent companies, with a percentage that allows it legally to control in their management and draw its general plans(Corporate Finance Institute, 2015a). This type of company can own stocks in another company as waqf.

This is based on the above-mentioned permissibility of using undivided shares for waqf.

4.2. Definition of Waqf (Mawqufah) Company

Due to the fact that a waqf company is a new development, there is still not a universally accepted definition. However, some of the contemporary researchers made some attempt and defined the waqf company as follows:

a. The use of a commercial company to mobilize waqf assets and manage the same in accordance with the same commercial laws that bind the commercial company(Al-Muhana, n. d, 9).
   Observations of the above definition:
   i. This definition limits waqf companies to a combination of waqf assets. While in fact, it is possible that the company can consist of a single waqf asset, through its legal person status to create a company, or by transferring the shares or stocks which are owned by some people to the ownership of the waqf through a sale transaction or as a gift. Otherwise, they can dedicate the shares as waqf in the first place(Al-Muhana, n.d).
   ii. The ownership of waqf or other things as the capital of a company seeking profit, and then liquefy generated profits (Al-Rajhi, 2016, p. 41).
   Observations of the above definitions:
   This definition above makes waqf companies be bonded to the ownership of a waqf asset. At the same time, there is no prohibition for creating an independent waqf company with no ownership of or bonding to a waqf asset.
   The most important features of a waqf company will be highlighted next, followed by its definition:
b. The waqf company is an investment company, so there is no work or personal partnership.
c. Absence of personal element in the waqf company, so there is no effect by partner death or related matters.
   In view of the foregoing, a waqf company may be defined as:
   "A company whose stocks and shares are all waqfs."
   This comprehensive definition includes all kinds of waqf companies because a waqf company is either an independent and established in the beginning as a waqf company, or it is a

commercial company that is owned by a waqf asset (or as a waqf asset) whether the donor of the company is a natural person or legal person. The stocks of both types of companies must all be waqf to be considered as a waqf company in terms of law and Shariah. So, this definition is one-size-fits-all.

At this point, it is necessary to shed light on two issues of major confusion among some researchers:

First: Making a percentage of a commercial company's stocks waqf, does not change the company description to "waqf company". No matter how large this percentage, even if some professionals think so. A company cannot be considered waqf except if all its stocks are waqf. Therefore, whoever transfers some stocks to be a waqf; only the dedicated stocks would be considered as waqf, not the entire company.

Second: If a man donates an amount of money to be a waqf, then afterward, he used the same money to buy a company for the purpose of investment. This company is considered an Investment Company, not waqf in the place of the waqf money he used. Moreover, selling this company or its stocks is permissible for better investment for waqf benefits. The amount of money invested is only a waqf asset.

At this point, the confusion is dispelled, and the point of flawed methodology is clarified. This is an issue that has confused some of the researchers who consider the previous scenarios as waqf companies that are impermissible to sell or trade their stocks for investment purposes.

4.3. The objective of establishing Waqf Companies

a. It is widening the range of managing waqf assets to include multilateral trading, which the modern law established. This would allow it to bid and enter the major business through which some financial resources can be acquired to contribute to raise the value of waqf assets and increase returns as well.
b. He was restraining the practices of managers and administrators on Awqāf to be under laws (Al-Muhana, n.d, 29).
c. Benefiting from corporates and waqf companies' governance, to achieve the maximum benefit from the waqf assets.
d. Develop the performance and expansion of waqf fund investment through commercial companies.

e. Eliminating risks through a separation of charitable work and investment practices.
f. Taking benefit from some advantages which are only available for companies, like employment recruitment, investment licenses, and others.

4.4. The Legal Format of Waqf Companies

It was previously mentioned that the definition of modern companies is divided into:

a. Investment companies (including Stock Companies and Limited Liability Companies).
b. Partnership companies (including Joint Liability Companies and Joint Venture Companies).

The direction of the researchers which should be implemented is the categorization of waqf under the first category (investment companies), not partnership companies(Al-Shubaili, 1438AH). This is because the partnership companies are related to persons and partners and have no independent financial account. The partner accounts in partnership companies are not limited to their capital in the company, but it extends to their other personal wealth. On the other hand, the investment companies are not about persons and have an independent financial account of partners. The partners' accounts are limited to what they own in these companies, and it does not extend to their other personal wealth.

This meaning is effective in the creation of the concept of waqf for modern companies. Thus, the systematic consequences of partnership companies do not suit the waqf in the essence of being a legal person, nor does it suit its financial account in Fiqh, notably in waqf-debt in accordance with the above-mentioned parameters.

This assertion is based on the reality of the systematic and legal companies, in the absence of a separate law for waqf or non-profit companies, which grants personality or limited liability to the waqf company even though no form of Investment Company has been assumed.

Accordingly, the most suitable form for waqf companies is the closed joint-stock company[1] and Limited Liability Company.

4.5. Discussion and Jurisprudential Implication of Waqf Companies and Its Implementation

The jurisprudential implication of a waqf company is based on the subject matter of waqf. Is it the entity that has been registered or the assets of the company or the shares? The most convincing idea is that the subject matter of waqf is the shares and assets of the company. However, the mode of dealing with shares is different from the assets that represent them. This leads us to examine the difference between waqf, which its corpus is assets, and waqf, which is corpus is an investment.

Tangible Waqf: This is the waqf in which the intention of the settlor is aimed at a specific asset that is perceivable.

Among the conditions for this kind of waqf is the permission to benefit from the original waqf asset as long as the basic substance of it is not depleted, which means that the original asset is not diminished or destroyed in any way through the consumption.

Ibn Qudāmah argued thus, "it is not possible to benefit from waqf without having the corpus in existence such as dinars and dirhams, food, drinks, wax, and similar things.; it is not allowed to make waqf of them in the general opinion of the people of knowledge. This is because waqf is the suspension of a specific asset (for the cause of charity) and distributing whatever it produces. Therefore, that which cannot be benefited from except through its depletion is not allowed to be made as waqf (Ibn Qudāmah, 1968, vol. 5: 374; Abidin and Amin, 2003, vol. 4: 364; Al-Hattab, 1992, vol. 6: 22; Al-Mawardi, 1994, vol. 9: 379; Al-Sharbini, 1994, vol. 3: 525).

[1] Khaled Al-Rajhi, *Al-Sharikat Al-Waqfiyyah*, P:45. He stated: the waqf company cannot be an open joint-stock company but rather a closed joint-stock company. I see there is objection to making the open joint-stock company as waqf; it is permissible for it to be considered as a temporary waqf. Although, the investor can sell his stocks after the maturity date of the waqf; the buyer will be considered as a new donor. The application of this case may face some difficulties because it requires a legal supportive environment to arrange the exit of the old donor and the entry of new ones.

This type of waqf maintains perpetuity of the original waqf asset, and therefore this type of waqf is suitable for creating waqf certificates as the asset will become a waqf itself. Under this type of waqf certificate in the registers are the real estate properties because they are waqf assets. Therefore, it is not allowed to sell them or use them in a way where ownership is transferred except with the permission of a judge that has jurisdiction over waqf matters.

4.6. Investment waqf

It is the awqāf, in which the intention of the donor is to grow an asset that is developing and being used according to the standards of business, not for locking it up. Thus, the objective of these assets is the perpetual continuation of the waqf with those assets or their alternatives as a waqf company. This type of waqf, in general, is not mentioned in the waqf certificates that the assets are meant to be waqf themselves. Therefore, investment waqf is assets placed for the general purpose of waqf, but to be used for investment, not to be held individually. It is generally not mentioned on an ownership certificate that the asset is waqf so that it is not bound by the restrictions of waqf assets.

Based on the previously discussed differences between the tangible waqf and investment waqf, in this case, stocks in the waqf company are considered as tangible waqf assets. Therefore, the transacting of these stocks is not permissible, except within the limits of *istibdāl* (substitution) conditions mentioned by scholars about tangible waqf. Thus, AAOIFI summarised these conditions as follows (AAOIFI Shariah Standard, 2017, no. 60):

a. The proposed substitution must serve the interests of the Waqf.
b. There should be no ulterior motive or intention of favouritism in the substitution.
c. Based on experts' opinions and values, the substitute should not be less valuable or less lucrative than the old asset.
d. Expedience in buying the new assets immediately after the sale of the old one, except where the delay was necessary.
e. The substitution of the waqf, assets must be subject to the authorized approval –if any- or according to a relevant sharia statement (*fatwa*).

Selling stocks of waqf company can be considered permissible if the waqf is temporary along with the requirement from the contributors that the buyer of these stocks must have the intention to donate it as waqf. Thus, the company will continue as it was. Similar to what has been stated before, the waqf company is an investment company, and there is no personal character involved. Nevertheless, the application of these conditions requires a legal environment from competent authority.

On the other hand, properties are investment Awqāf and are developed and used for investment purposes according to trade requirements.

About the commercial register, it is just a record and register of the company in the books of the relevant ministry for the purpose of declaration. However, it does not have any value, so it cannot be the waqf subject or asset. Finally, the legal personality is a financial account that has the ability to impose and receive obligations. It also cannot be the waqf subject or asset.

4.7. The effect of Waqf company on Zakat

To understand the Zakat on waqf funds, we must address an important p, a point which is determining the owner of the waqf money. Full ownership of the asset is one of the conditions for the obligation to pay Zakat upon those who are legally accountable. One of the kinds of money that scholars have disagreed upon regarding the extent to which ownership is realized is the (*mawquf* money). Scholars have the following opinions:

The first opinion: Waqf does not belong to either the donor or the beneficiary, but to Almighty Allah.

This is the popular opinion by the *Hanafi* school of thought, the most apparent opinion of Shāfiʿīs and narration by Ḥanbalī (Al-Kasani, 1986, vol. 6: 221; Ibn Rajab, n.d, vol. 3: 359; Al-Nawawi, 1985, vol. 5: 343). According to this opinion, paying *Zakah* is not obligated on *waqf* because of the lack of complete ownership.

The second opinion: the donor owns the Waqf asset. This is the popular opinion of the Maliki School, the second opinion for Shāfiʿī and narration by Ḥanbalī (Al-Dasuqi, n.d, 4: 76; Al-Ramli, 1984, 5: 387; Al-Ṣāwī, n.d, 4: 132; Al-Mardawi, 1998, 16: 420).

According to this opinion, Zakah is obligated upon the Waqf funds or wealth. The donor or the administrator has to pay it by extracting it from the wealth that belongs to the waqf. It was narrated at Al-Mudawwana: "I said to Imam Malik, or he has been told: If a person donated 100 Dinar as Waqf (endowment), lending them to others and they pay it back, do you see an obligation of Zakah on it? Imam Malik replied: Yes, I would consider Zakat on it"(Imam Malik, 1994, vol. 1: 380).

The third opinion: the ownership of Waqf assets and benefits are transferred to the beneficiary if it is defined or limited. Otherwise, Almighty Allah is the owner. There is the opinion agreed upon by the *Hanbali* School (Al-Buhūtī, 1982, vol. 2: 170; Al-Maqdisi, n.d, vol. 1: 393). According to this opinion, Zakah is obligated if the beneficiary of the Waqf is defined or limited. Alternatively, there is no obligation to pay Zakah if the beneficiary is undefined and general.

The strongest opinion– and Allah knows best- is that there is no zakat on waqf wealth whether it is invested or not since no one owns it. This opinion is confirmed by the International Islamic Fiqh Academy (IIFA). The resolution stated:

The Council of the Islamic Fiqh Academy, holding its Fourth session, in Jeddah, (Kingdom of Saudi Arabia), from 18 to 23 *Jumada Thani* 1408 H (February 6 to 11, 1988), having considered the research papers submitted to the Academy concerning "Payment of Zakat on company shares."

First: Shareholders must pay Zakat on their shares. The company's management may pay Zakat on their behalf if its statutes so stipulate. Or by virtue of a general assembly ruling, or if the law of the land requires that companies must pay Zakat. Or if a shareholder himself empowers the management of the company to pay Zakat on his behalf.

Second: The management of the company shall pay Zakat on shares in the same manner as a person pays Zakat on his wealth. In other words, it shall pay Zakat on the assumption that the capital of all shareholders is the property of a single person, and calculate Zakat, accordingly, taking into account the type and value of assets subject to Zakat, its *niṣāb* (minimum requirement), the amount is taken, and any other consideration relevant to the Zakat of a human person. This ruling is in accordance with

the principle of mixed assets generally accepted by some Fiqh scholars concerning all assets.

In calculating Zakat, the company shall take due into account shares not liable to Zakat, such as shares owned by the Public Treasury, charitable institutions, philanthropic societies, and non-Muslim shareholders (IIFA-OIC, 1988Resolution no. 28 (4/3)). The Permanent Committee for Scholarly Research and Ifta in the KSA was asked about payable Zakat on Waqf money.

The question was: If one of the tribes gathered an amount of money for emergencies that may face them, or in case of blood money to be paid. They have decided to invest this amount of money, and the returns go back for emergencies too. Do they have to pay Zakat on that amount of money or not? And if they do not invest this amount of money, do they have to pay Zakat or not? And does the tribe itself have the right to pay into the pool of money their Zakat of gold and silver?

The answer was: "If the situation is as mentioned, so Zakat is not obligated on this amount of money because it is considered as Waqf"(Al-Lajinah Al-Daimah Li Al-Ifta, n.d, vol. 2: 291). Similarly, ʿUthaymīn (May Allah have mercy on him) was asked about giving Zakat money a small village association has collected from its people through a monthly subscription for supporting people in emergency cases of accidents, blood money, and loaning to those seeking marriage?

He answered (May Allah have mercy on him):

"There is no Zakat on this fund; because it is established through collected money from the subscribers, and it is outside the ownership of any specific owner. Therefore, there is no zakat on wealth that has unspecified ownership. Based on what has been stated above, Zakat is not an obligation upon a waqf company because all its stocks are waqf, and therefore the criteria for the obligation of Zakat does exist (ʿUthaymīn, 1413, v. 18: 184).

4.8. Example of a Waqf Company Application in KSA: establishment, and *Zakah* Treatment

There is no specific law for Waqf companies in terms of the establishment. But there are some practices conducted as follows:

1. Issuance a Waqf "*sākk*" (note or certificate) for property or money, thereafter, establishing a waqf company owned by that Waqf.
2. Establishing a joint-stock commercial company then transferring it as a Waqf in the Personal Status Court. Then register the company in the ministry of commerce as a waqf company.

Zakat on Waqf companies: Saudi Arabia's Minister of Finance has issued a ministerial decree which states that there is no Zakat obligation on that type of company, nor on its returns, as long as it is serving the public charitably. However, clear and strict controls must be declared to investigate this case. This ministerial decree in full states:

"The Minister of Finance, According to The Royal Decree No 17/2/28/8634 on 29/9/1370 A.H, which addresses the Shariah fulfilment of Zakat from Saudi nationality holders in compliance with the Shariah rulings and its updates.

Building on what has been presented by the director of the General Authority for Zakat and Tax (GAZT), in his statement No 308/1/1435 on 27/11/1435 A.H regarding the fatwa no. (26272) on 30/10/1435 A.H, which states the obligation of Zakat on the returns of Charitable Waqf as long as it is serving the public and its returns are being paid in general charity. Even if the Waqf is making investments and generating profits, regardless of whether it is invested through a company or other means, this does not affect the exemption of the donor to spend some of the returns to use for food, drink, or good deeds, because that exempted amount from the returns is consumed and is not money or wealth in savings over a year (*ḥawl*), so there is no Zakat on it.).

For the necessity of establishing clear controls to verify the applicability of the conditions stated in the Fatwa, it is necessary in the following cases to ensure the following parameters:

First: The waqf money must be documented with the Ministry of Justice by issuing a sharia "*sack*" document.

Second: The returns of the waqf must be specified as well as the manner of use for charitable public benefit.

Third: The exceptional part of the Waqf should be fully consumed, and there should be no excess liquidity that would incur the obligation of Zakat.

Fourth: The commitment to reporting audited financial statements for the waqf money by an authorized legal accountant office. Moreover, providing these statements to the authority companied with all the attached reports and statements within (120) days from the end of the financial year. The financial statement must include the following:

a. An attached statement clarifying the expenditures with the following details:
   - The name of the beneficiary, whether it is a natural or legal person.
   - The number of the Commercial Register for the beneficiary, and his file number in the Authority –If any.
   - The nationality and place of residence of the beneficiary.
   - The amounts of money the beneficiary received.
b. Licenses regarding all transactions between the waqf money and the connected parties who are subject to pay Zakat. Those transactions should be according to prices between independent parties.

Fifth: Commitment to providing the authority with information about concluded contracts with the private sector at statutory times. In addition to fulfilling requirements of tax duties on the payable money to non-resident parties in KSA, according to articles no. (61) and (68) in income tax law issued by Royal Decree no. 8634/28/2/17 15/01/1435A.H (Saudi Arabia, 2017).

Sixth: This resolution shall apply to all cases provided to the Authority, and It shall be informed to whoever it may concern for implementation (Saudi Ministry of Finance, 1439AH)."

5. Conclusion and Recommendations

This research was conducted on waqf company with the objectives to study the concept of waqf company. To do this, the research was based on Saudi law and practice of waqf company. Then the jurisprudential analysis followed. The research also looked at the issue of Zakat on waqf company. To actualize the objectives, a qualitative method with content analysis was adopted.

The most significant findings and conclusion of the research are as follows:

1. The research found that a waqf company is a company whose shares are all waqf.
2. The researcher finds that the most accurate interpretation is that the allocation of a portion of shares of a commercial company as waqf does not grant it the status of a waqf company because a waqf company is the only one which the entirety of its shares is waqf.
3. A waqf company is formed with money, so the company is not formed based on the contribution of labour, reputation, or otherwise.
4. If a person makes a waqf of cash, then they later use that cash to buy a company for the purpose of investment, so in this case the company is an investment company and is not a waqf itself. Therefore, the original waqf remains the amount that was endowed.
5. The waqf asset in a waqf company is the shares and existing assets, except that shares have a different ruling for their handling as compared to that of similar existing assets. Shares of a waqf company are considered to be in themselves waqf property. As a consequence, it is not permissible to make use of them except within the limits and conditions of *istibdāl* (substitution) of a waqf asset, which saves been mentioned by the scholars of *fiqh* that has been allocated as whether it is for investment or not, is not the property of any individual. As a consequence, there is no zakat upon such wealth according to the most accurate opinion. In addition to what has been agreed upon in this matter among the scholars, there is no zakat upon a waqf company. Because all

shares of a waqf company are waqf themselves, there is no avenue to impose Zakat on them.

6. In terms of incorporation, there is no specific structure for a waqf company. But there are practices in the Kingdom of Saudi Arabia that are based upon the following:
    a) Issuing waqf certificates (*ṣakk*) against land or cash to create a standard waqf, then establishing a waqf company that belongs to the newly established waqf.
    b) Establishing a commercial company with shares, then making it a waqf in the court of personal affairs. Afterward, the registration of the company in the ministry of commerce as a waqf company takes place.

The researcher recommends holding specialized seminars on the topic of waqf companies in order to study and explore the detailed rulings for all its subtopics and various interpretations.

The researcher advises toward the urgency of encouraging different countries toward this type of waqf because through it; many people can participate in waqf by partaking in waqf companies.

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The Potential of Islamic Finance in Reinforcing and Regaining Economic Stability in Qatar

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ABSTRACT

The COVID-19 has put a severe dent in the resilience of several economies by slowing down the economic growth. The challenge for Qatar was more severe as the occurrence of pandemic collided with the ongoing political blockade from 4 neighboring counties and Qatar's commitment of hosting 2022 FIFA world cup. This contextual research of COVID-19 attempts to identify the potential of Islamic finance in reinforcing and regaining economic stability in Qatar. The desk research has adopted the explorative method and analyzed the research reports in the context of the current landscape particularly looking from the angles of economic, social, financial and health impact. Government and institution measures in response to COVID-19 and stimulus packages were discussed; and Islamic social finance tools, *Zakat*, *Infaq*, *Qard Hassan*, and *Waqf* were proven to be resilient to the situation. Moreover, the excessive liquidity in the Islamic banks in Qatar, Formosa *Sukuk*, *Waqf*, *Zakat* and policies based on objectives of Shari'ah have a great potential for reinforcing and regaining the economic stability in Qatar. The research shall help streamline the thought process for the policy makers and the practitioners of Islamic finance industry, especially in Qatar.

ملخص

لقد تسبب فيروس كورونا المستجد (كوفيد-19) في إحداث تأثير حاد في مرونة العديد من الاقتصادات من خلال إبطاء النمو الاقتصادي. وكان التحدي بالنسبة لقطر أكثر شدة حيث تضارب تفشي الوباء مع الحصار السياسي المستمر من 4 دول مجاورة والتزام قطر باستضافة كأس العالم لكرة القدم 2022. ويحاول هذا البحث السياقي حول كوفيد-19 تحديد إمكانات

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التمويل الإسلامي في تعزيز واستعادة الاستقرار الاقتصادي في قطر. واعتمد البحث المكتبي الأسلوب الاستكشافي وحلل التقارير البحثية في سياق المشهد الحالي وخاصة بالنظر من زوايا التأثير الاقتصادي والاجتماعي والمالي والصحي.تمت مناقشة التدابير الحكومية والمؤسسية المتخذة استجابة لفيروس كوفيد-19 وكذا الحزم التحفيزية، وأثبتت قدرة أدوات التمويل الاجتماعي الإسلامي، والزكاة، والإنفاق، والقرض الحسن، والوقف على الصمود في مواجهة الوضع. وعلاوة على ذلك، فإن السيولة المفرطة في البنوك الإسلامية في قطر، وصكوك فورموزا، والوقف، والزكاة والسياسات القائمة على أهداف الشريعة، تتوفر على إمكانات كبيرة لتعزيز واستعادة الاستقرار الاقتصادي في قطر. وسيساعد البحث في تبسيط عملية التفكير لدى صناع السياسات وممارسي صناعة التمويل الإسلامي، خاصة في قطر. الكلمات الدلالية: تأثير كوفيد-19، الاقتصاد القطري، إمكانات التمويل الإسلامي.

ABSTRAITE

Le COVID-19 a fortement entamé la résilience de plusieurs économies en ralentissant la croissance économique. Le défi pour le Qatar était d'autant plus grave que l'apparition de la pandémie se heurtait au blocus politique en cours de 4 comtés voisins et à l'engagement du Qatar d'accueillir la coupe du monde de la FIFA en 2022. Cette recherche contextuelle de COVID-19 tente d'identifier le potentiel de la finance islamique dans le renforcement et le rétablissement de la stabilité économique au Qatar. La recherche documentaire a adopté la méthode exploratoire et a analysé les rapports de recherche dans le contexte du paysage actuel, en particulier sous l'angle de l'impact économique, social, financier et sanitaire. Les mesures prises par le gouvernement et les institutions en réponse à la COVID-19 et les plans de relance ont été examinés ; et les outils de finance sociale islamique, la zakat, l'infaaq, le qard hassan et le waqf se sont avérés résistants à la situation. De plus, les liquidités excessives des banques islamiques au Qatar, Formosa Sukuk, Waqf, Zakath et les politiques basées sur les objectifs de la Shari'ah ont un grand potentiel pour renforcer et retrouver la stabilité économique au Qatar. La recherche doit aider à rationaliser le processus de réflexion pour les décideurs politiques et les praticiens du secteur de la finance islamique, en particulier au Qatar.

Keywords: COVID-19, Qatar’s Economy, Potential of Islamic finance

JEL Classification: E60, G18, H54, L52, O17

1. Introduction

The outbreak of COVID-19 in Wuhan - China has surpassed between 15 Dec 2019 and 10 Jan 2020, from being an epidemic to be a pandemic (Huang, Lin, & Xu, 2020). It has paralyzed the supply chain due to lack of inputs worldwide resulted from fall in labor supply and international trade and lowered the demand due to a reduced social consumption in the form of lockdowns, closure of restaurants and tourism. In the very early stage 'The Guardian' reported that over 22 million Americans filed for unemployment benefits (Cohen & Kammen, 2020), and the prices of US crude oil collapsed from $18 a barrel to -$38 in a matter of hours (Farrer, 2020).

Countries across the world had to response quickly to the healthcare emergency, regardless the fact that the response shall steepen the recession. The World Bank's Global Economic Prospects report of June 2020 envisioned and forecasted a contraction of 5.2% in global GDP, while the contraction is expected to be 7% for the developed countries and 2.5% for the developing countries (World Bank Group, 2020).

The pandemic poised Qatar in a more challenging situation as the COVID-19 hit on Qatar economy had happened to be an addition to the ongoing challenges faced by country's economy. In addition to the declined oil prices since 2014, Qatar has been dealing with the political and economic blockade from neighboring GCC member countries, except Kuwait and Oman, since 2017. The infrastructure development commitment for hosting FIFA 2022 World Cup is still to be accomplished.

2. Literature Review

Ever since the outbreak of COVID-19, several events have been cancelled or turned them into online format, including the prestigeous12th International Conference of Islamic Economics and Finance which was organized by Istanbul Sabahattin Zaim University in June 2020. Conference was dominated by papers on Islamic social finance tools, digitalization, fintech, blockchain and digital models, which have demonstrated great promise during the COVID-19 and are creating a realization for the future.

Islamic Development Bank (IDB) launched the COVID-19 Funding program (Islamic Development Bank, 2020). The program has been successful in providing support to more than 19 IDB member countries to combat the deadly virus. Another program by to support IDB member countries in combating COVID-19 is UNOPS (Islamic Development Bank (a), 2020).

An important book project is underway under the editorship of M Kabir Hassan, Aishath Muneeza, and Adel M. Sarea on *COVID-19 and Islamic Social Finance* by Routledge scheduled to be published in 2021. It is divided into three major parts: Part I deals with poverty and COVID-19; Part II deals with innovation in Islamic social finance that rose against COVID-19, and finally Part III deals with impact of COVID-19 on Islamic microfinance. Some country models are presented such as Iran was covered in Part I and Kuwait, Saudi Arabia, and Turkey were examined in Part II. Part III which deals with Islamic microfinance has given special attention to Nigeria, Brunei, and Indonesia.

The Emerald has announced a special issue of *International Journal of Islamic and Middle Eastern Finance and Management* on COVID-19 Pandemic Crisis and Islamic Finance. Similarly, Hamad Bin Khalifa University, College of Islamic Studies announced in its next International Conference on Islamic Finance, a sub-theme on Implications for Islamic Finance and Economy in Post Pandemic Era to be held in Doha in April 2021.Sherif (2020) in his paper examines by utilizing performance of shariah-compliant stock returns by utilizing UK Dow Jones Index data. It argues that there is a strong and statistically significant relationship between the COVID-19 pandemic and the performance of the conventional stock market index.

Nienhaus discussed the impact of the pandemic on Islamic finance outlined pre-corona trends and the feedback efforts on its future focusing on more equity-like financing, ESG, and SDG-themed *Sukuk*. The important role of advanced digital technology in microfinance, as well as the social finance instruments and other philanthropic models were also discussed (Nienhaus, 2020). In conclusion, he draws that the Islamic finance future will be influenced by crisis-induced changes in human behavior, accelerated technological developments, market peculiarities, and strengthened awareness of Islamic values, among others.

A series of cases studies were presented on the Impact of COVID-19 Outbreak on Islamic Finance in the OIC Countries, Qatar was not among them, which was edited by Hidayat, Farooq and Alim (Hidayat, Farooq, & Alim, 2020). An overview of the impact provided by the editors is quite general in nature, mostly providing statistics about the COVID-19 cases and their recoveries, etc. The case of Bahrain suggested establishment of an *awqaf* fund by the Islamic finance institutions to support the affected families as part of CSR activities. The case study on Bangladesh described that the entire Islamic finance sector is in grave situation due to the outbreak of coronavirus. A few regularly measures were recommended including the need for revamping monetary and fiscal policies as prerequisites for fighting the crisis, along with attention to proper infrastructure and the utilization of technology (internet banking).

The Journal of Muamalat and Islamic Finance Research has published a special issue on COVID-19, to shed light on the pandemic's impacts on the economy and realization of *maqasid al-shariah* and Islamic finance. This special issue has given account of how the landscape of Malaysian businesses has changed in all sectors that resulted in a loss of huge revenue and how Islamic finance industry has taken the measures to overcome the COVID 19 challenges. Like other countries, consumer behavior has changed. The job market, salary and budget cuts are also observed in Malaysia Several papers include from the guest editor himself (Shaharuddin 2020). Each study has covered different aspects which directly and indirectly deals with impacts due to pandemic.

Indonesia has introduced several stimulus concessions such as tax benefits to corporate world, allowing sovereign bonds to be purchased directly from the primary market and increasing the domestic investment shares in the capital market stable. The performance of microfinance institutions and SMEs were severely impacted; however, the agricultural sector had shown some improvement. As part of social security Islamic social finance solution was recommended based on *Zakat* and *Waqf* (including cash *Waqf*) to cater to the basic needs of the community.

Iran was one of the first countries to face corona virus. Unemployment and shutting of the tourism industry made the country's economy take the downward trend drastically. Government has taken the measures to provide *Qard Hassan* and subsidize the goods and especial assistance to low-income families. While the industrial sector faced severe impacts but some increase in health and pharmaceutical industries can be well noticed.

Some suggestions including cash relief packages, deferring the repayment of loan can prevent check bouncing and deferred claims from commercial banks, while revitalizing the manufacturing units.

In Turkey various taxes were deferred, while different economic and financial aid packages were announced. Most important support initiatives introduced for businesses were to provide employment support so that companies do not lay off workers. Turkey's government launched an aid campaign across the country and was able to collect donations of about 2 billion liras. However, this figure turned out to be far below the required amount.

In UAE, the Higher Shariah Authority reiterated the general sentiment as it urged Islamic financial institutions to support the most affected customers and economic sectors. Elsewhere, a similar statement might have also been issued by the Shariah board of Islamic financial institutions.

Arfah et al (2020) has conducted an interesting study of the economic role of sharia as a way to cope up as post COVID 19 agenda to recover from the pandemic recession. It emphasizes the optimization of the shariah economy based social tools such as *Zakat*, *Infaq*, *Sadaqah* and *Waqf*. Topcu and Gulal (2020) has undertaken another study comparing the emerging stock markets in Asia and Europe. Although this study does not deal with Islamic stocks but as a general indicator it is interesting to find that the impact of COVID 19 outbreak had the highest on Asian emerging markets compared to Europe.

Ashara's (2020) study reveals that government initiatives of social distancing measures had a direct negative effect on stock markets returns whereas other measures such as public awareness program, testing and quarantine policies and stimulus packages results in positive market returns. Ali (2020) in a Qatari newspaper, *The Peninsula* covered a story to conclude that despite several cases reported and the support of Qatar has seen unprecedent growth in E-commerce market. According to Qatari Transport and Communications Ministry there are more than 350 E-commerce initiatives which is an indication of the growth in online retail market.

Al-Dosari (2020) found to be an interesting as it deals with sporting industry especially Qatar being the country which is scheduled to host

2022 FIFA World Cup. This case study involves the different stakeholders and the impact of COVID-19. The data collected by the author via questionnaire suggested that COVID-19 has adverse impact on economic, social and financial and health impact. In conclusion it recommended that FIFA and the hosting country should take full precautionary measures to expect any unforeseen atrocities such as pandemic.

3. Dynamics Of Qatar's Economy

The demographic outlook shows that Qatar is comprised of 88% immigrants and 12% natives. Mere 1.34% of the population is above 65 years, while most of the population at 73.56% is between 25 to 64 years, 14.12% of the population is less than 15 years, and 10.97% of population is between 15 to 24 years. (State of Qatar (e), 2020). Thus, the policy of not allowing the immigrants of 60 years and above to stay in Qatar has partially contributed to low impact of COVID-19 on Qatar.

3.1. Qatar's Political Leadership And Economic Circuits

Qatar's major revenue comes from the extraction of natural gas as well as oil funds the country's state expenses and imports. The revenue is then used in the diversification of the economy. The citizens in Qatar also benefit from the extraction of oil that is solely done by the government through healthcare funding, housing and high compensation for public work (Kaya & Tsai, 2016).

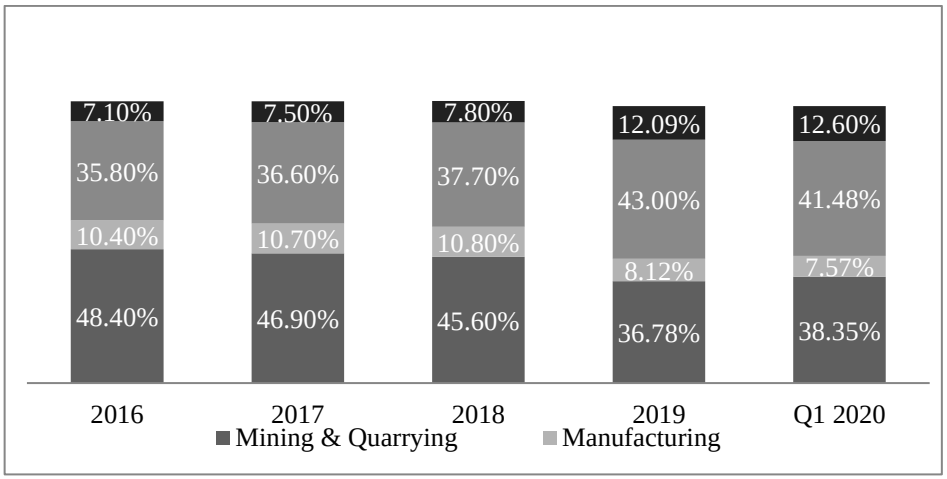
The three major economic circuits are productive, financial circuits and commodity circuits. These circuits are important for any transformative economic system (Hanieh, 2016). The export revenue is brought in the country through the productive circuit. Investing in steel and aluminum and other energy-intensive projects is part of the expansion through utilizing cheap energy (Hertog, 2010).

The finance circuit is the second most important sector in a transformative state. Numerous banks in GCC banks were developed to transfer funds and income obtained from the extraction of oil and gas. The extra money circulates in the economy as credits to individuals and domestic firms thus stimulating the local economy within the countries of the GCC. The majority of the local banks within the GCC countries are owned and controlled by the government, ruling families and merchant families

(Hanieh, 2016). These influential merchant families involved in the management of these banks are elite and have political influence over other citizens. "The ruling agreement" clearly outlines the most efficient method of allocating finances and capital to individual groups and families.(Al-Muharrami, Matthews, & Khabari, 2006). The commodities sector is the last sector in any transformative economy. It includes the selling and buying of non-tradable goods and services which include healthcare, education and dealership (Kaya, Tok, Koc, Mezher, & Tsai, 2019). The increase in prices increases the overall income in the country (Ismail, 2010). The higher the profits in non-tradable commodities the better for the industries dealing in those commodities (Matsen & Torvik, 2005). Known tribal leaders and royal family members are the majority of the conglomerates that control the commodity circuits in the GCC states (Hanieh, 2016).

3.2. Qatari Economy's Sectoral Composition

Figure 1: Qatar Real GDP Decomposition by Sectors (%)

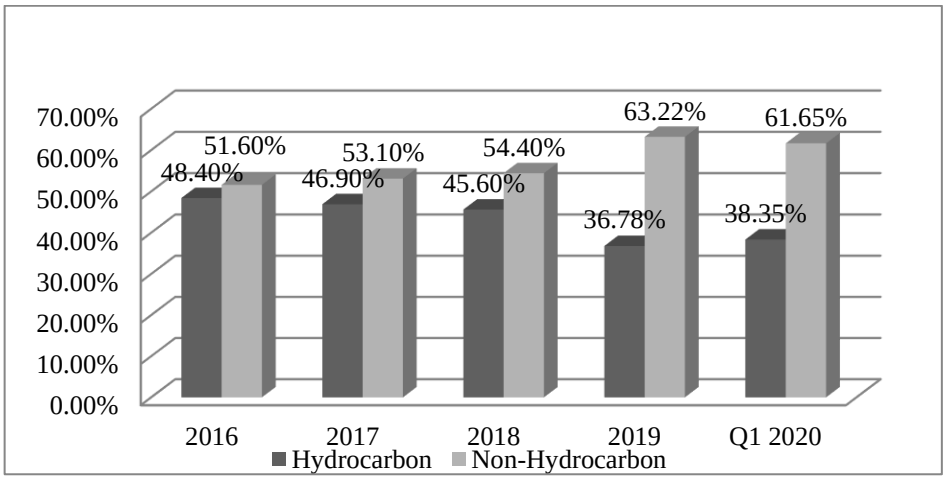


Source: International Monetary Fund, Regional Economic Outlook: Middle East and Central Asia: 2018; Planning and Statistics Authority of Qatar, Press Release Qatari National Accounts: 1st Quarter 2020

Before the discovery of oil reserves in Qatar, the main economic activity in the region was pearling and fishing. The Planning and Statistics Authority has categorized the production and exploration of oil and gas

under the mining and quarrying sector while the production of petrochemicals is grouped under the manufacturing sector in Qatar. Most production in the manufacturing sector is linked to oil and gas for the production of petrochemicals.

Figure 2: Hydrocarbon and Non-Hydrocarbon Sectors Composition (2016-2020)



Source: International Monetary Fund, Regional Economic Outlook: Middle East and Central Asia: 2018; Planning and Statistics Authority of Qatar, Press Release Qatari National Accounts: 1st Quarter 2020

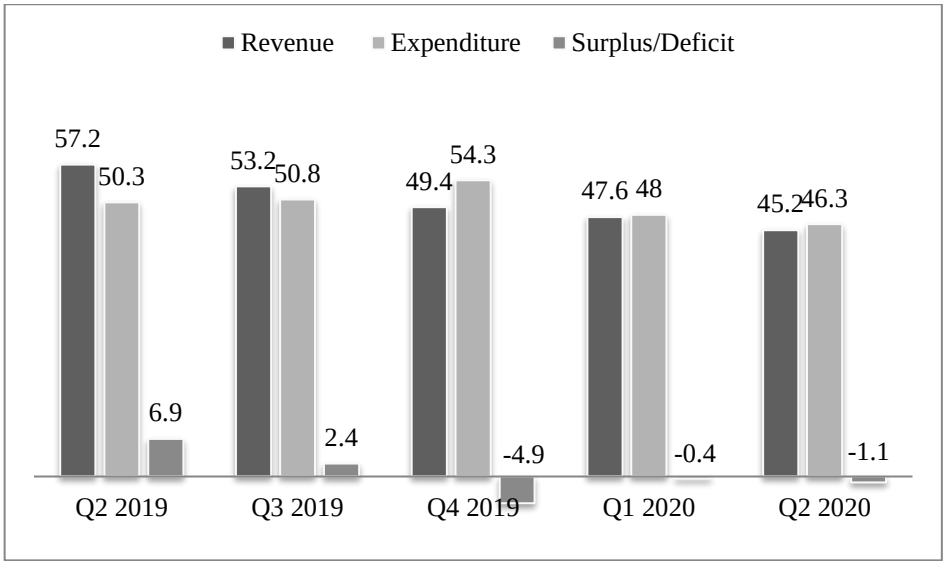
Qatari economy can be broadly divided into hydrocarbon and non-hydrocarbon sectors. Although Qatar has adopted the policy of diversifying the economy by lessening the dependency on the hydrocarbon sector of economy, the hydrocarbon sector has been contributing a considerable, if not the major, share to the GDP of Qatar (State of Qatar (a), 2020). Oil, another composite of hydrocarbon sector of Qatar, encompasses proved oil reserves of more than 25 billion barrels which are expected to be the potential for continuing the production for another 56 years at the current levels (fanack.com, 2020).

4. Impact of Covid-19 on Qatar Economy

In this section, the statistics and figures reported by the ministries and different authorities of Qatar before and during the prevalence of pandemic will be reviewed to assess its impact on Qatar economy.

4.1. Impact of COVID-19 on Public Budget

Figure 3: Revenue, Expenditure and Surplus/Deficit

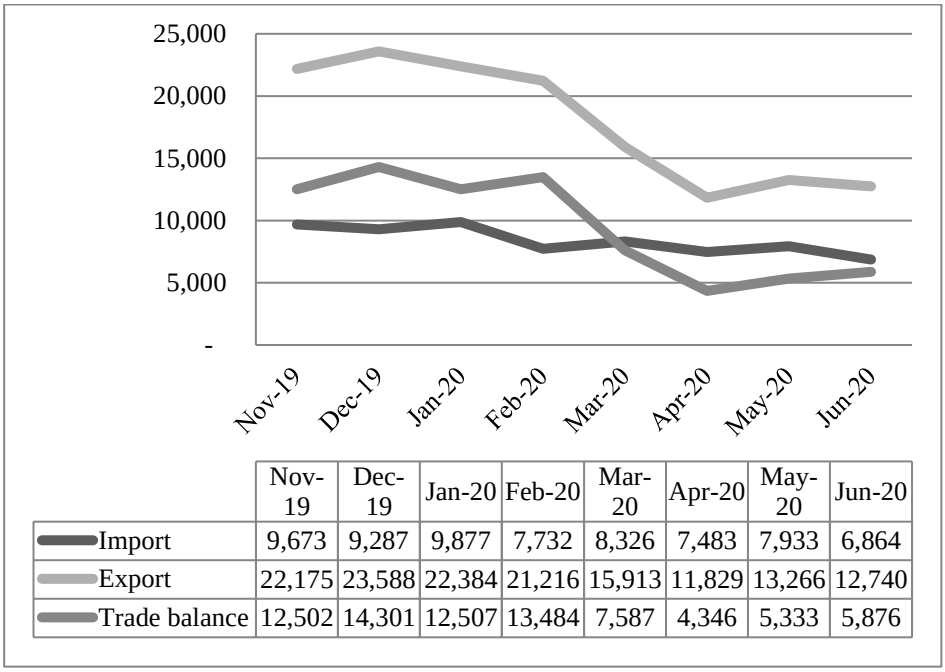


Source: Ministry of Finance, Statistics: 2020

The impact of COVID-19 on Qatar economy was much evident in shrinking public budget reported by the Ministry of Finance ever since the beginning of this year. The government curtailed the expenditure substantially on major projects from QR26.1 billion in Q4 2019 to QR15.3 billion in Q2 2020. The review of surplus/deficit status shows that the public budget is unable to fully recover from deficit ever since Q4 2019. The deficit in Q2 has further declined from being -0.4 at the end of Q1 to be at -1.1 by the end of Q2 2020 to evidence the negative impact of COVID-19 (State of Qatar (c), 2020).

4.2. Impact of COVID-19 on Foreign Trade

Figure 4: Qatar Import, Export and Trade Balance (in Millions)



	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Import	9,673	9,287	9,877	7,732	8,326	7,483	7,933	6,864
Export	22,175	23,588	22,384	21,216	15,913	11,829	13,266	12,740
Trade balance	12,502	14,301	12,507	13,484	7,587	4,346	5,333	5,876

Source: Planning and Statistics Authority of Qatar, monthly statistics report: December 2019 to July 2020

The foreign trade also succumbed to decline in both the terms of imports and exports. Within the period of 6 months from January 2020 the imports declined by almost QR3000 million, while the exports declined by around QR10000 million. So, the trend is heralding a negative impact of COVID-19 not only Qatar but also on the rest of the world (State of Qatar (d), 2020).

4.3. Impact of COVID-19 on Consumer Price Index

Table 1: Impact of COVID-19 on Consumer Price Index (Base Year 2018)

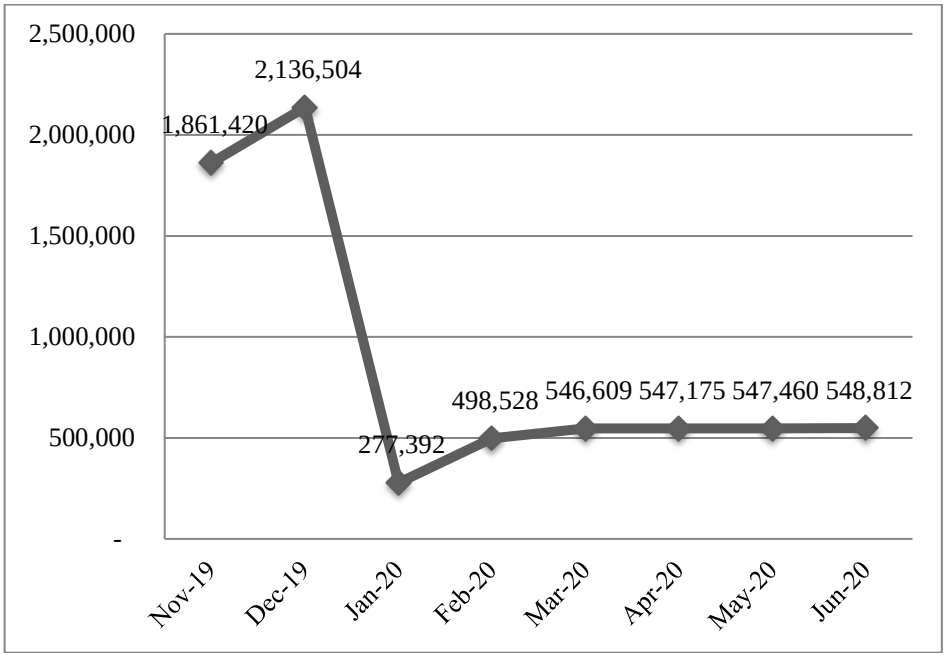
	General Index	Health	Transport	Communication	Recreation	Education	Restaurants & Hotels
Jan-20	98.4	102.8	97.5	90.8	92.1	106.1	104.1
Feb-20	98.4	102.8	99.7	90.8	88.9	106.3	104
Mar-20	97.5	102.8	101	90.8	80.7	106.3	103.5
Apr-20	96.2	101.5	96.1	89.8	80.7	106.3	100.9
May-20	95.7	101.5	94.9	89.8	80.7	106.3	100.5
Jun-20	95.9	101.5	98	89.8	75.8	106.3	100.5

Source: Planning and Statistics Authority of Qatar, monthly statistics reports: December 2019 to July 2020

The impact of COVID-19 is also well witnessed by the downward trend appeared in the general index related to Consumer Price Index (CPI) of household consumption. Recreation had a great fall of almost 17 points to reflect the impact of lockdown on the economy of Qatar (State of Qatar (d), 2020); *In fact*, such decline will have a negative impact on the expenditure of the households, which in turn shall reduce the income of business entities in Qatar.

4.4. Impact of COVID-19 on Tourism

Figure: 5: Impact of COVID-19 on Tourism

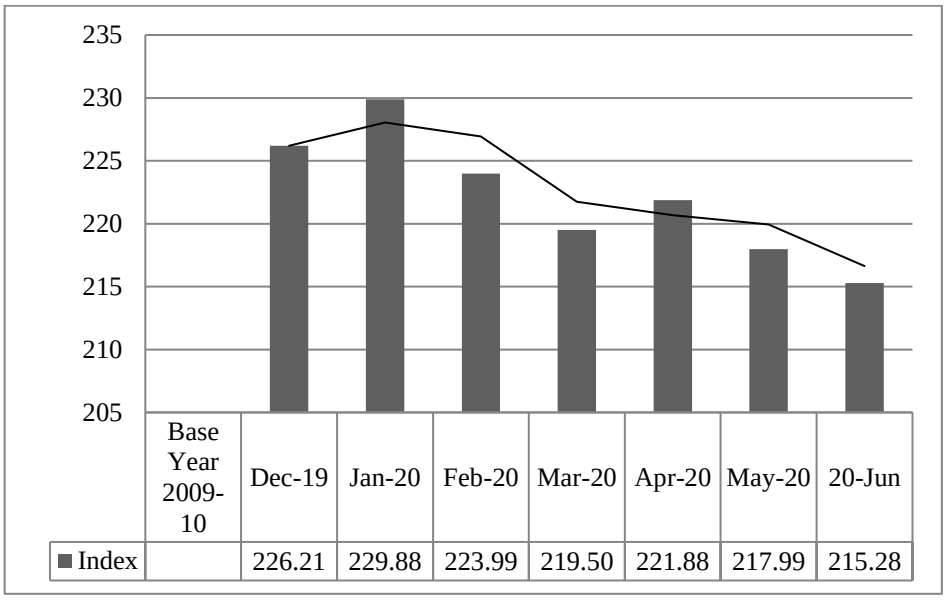


Source: Planning and Statistics Authority of Qatar, monthly statistics reports: December 2019 to July 2020

The tourism sector is the most badly hit sector of Qatar economy in the context of COVID-19. Due to the geopolitical blockade of neighboring countries the channel of land is not in function, while the sea routes are mostly used for importing the goods from other countries. Thus, the only active and preferred channel for tourists is the airways. In the context of pandemic, Qatar has been experiencing a very sharp decline of tourists which brought the figures of tourists from millions per month to the thousands per month. The declined number of tourists shall impact negatively on the revenue of the state and justifies the low figures in last two quarters of public budget by the Ministry of Finance reported under the revenue by other than oil and gas income category of the public budget.

4.5. Impact of COVID-19 on Real Estate Price Index

Figure 6: Impact of COVID-19 on Real Estate Price Index



Source: Qatar Central Bank, real estate price index: 2020

The price index of real estate in Qatar picked up by around 4 points in Q1 2020, however soon after the breakout of pandemic the real estate price index plunged down by around 7 points and the trend continued in the month of May and June after a slight recovery in the month of April. The market never reached the price index of January 2020 or December 2019 (Qatar Central Bank (a), 2020). Thus, the impact of COVID-19 is very much apparent in the real estate sector, which might be due to the fallen demand aroused from job losses and repatriation plans of number of expats who already went back to their domicile lands.

The other important composites of Qatar economy like Qatar Stock Exchange, insurance, banking, and non-banking financial institutions with due support of Qatar government's stimulus package are playing a very hopeful role in reviving the economy and restoring the economic growth in either the same or better instance.

5. Proactive Response of Qatari Government: Econmic and Financial Frontier

The Supreme Committee for Crisis Management (SCCM) under the presidency of the emir of Qatar passed eight crucial decisions that provided the framework for the economic stimulus packages in Qatar. The decisions were directly related to the economic and financial sector.

Table 2: Economic Stimulus Package Framework

Decision1	A financial support and economic incentive package or QR 75 billion for private sector.
Decision2	A directive to Qatar Central Bank (QCB) for installing an appropriate mechanism for enabling the banks to postpone loan installments and obligations of the private sector with a grace period of six months.
Decision3	A directive to Qatar Development Bank for postponing the installment of all borrowers for a period of six months.
Decision4	The government funds were instructed to increase their investment in stock exchange by QR 10 billion.
Decision5	QCB had to provide liquidity to the banks operating in the country
Decision6	Exemption from custom duties on food and medical goods for a period of six months.
Decision7	Exemption from water and electricity bills for six months granted to hospitality and tourism, retail, SMEs, commercial complexes, so that the exemptions the exemptions shall benefit the tenants.
Decision8	Exemption from rents for logistical and SMEs for a period of six months

Source: Official Website of Amiri Diwan

Qatar Islamic Bank (QIB), the biggest Islamic bank in Qatar, has introduced a new certificate of deposit called “Thank You” with higher rate of profits as a token of appreciation to the frontline workers combating COVID-19 like police workforces, medical professionals, and volunteers. The certificate is also a long-term savings tool as there is no limit for maximum deposit. Additionally, certificate holders are eligible to obtain finance up to 95% of the certificate deposit amount (Qatar Islamic Bank (a), 2020).

Table 3: COVID-19 National Response Program

Islamic Bank Name	Tenor of Guarantee	Repayment period	Profit 0-6 months	Profit 7-12 months	Profit 2-3 years
Qatar International Islamic Bank	6 months	24 monthly installments with a grace period of one year maximum	1.5%	QMR +1%	QMR+2%
Al-Rayan Bank Qatar	6 months	2 years and a grace period of up to 1 year	1.5%	QMRL+1% (minimum 3.5%)	QMRL+2% (minimum 4.5%)
Barwa Bank Qatar	3 months	Not in public access	Not in public access	Not in public access	Not in public access
Qatar Islamic Bank	3 months	2 years and a grace period of up to 1 year	Not in public access	Not in public access	Not in public access

Source: Official websites of QIIB, Al Rayan, Barwa, and QIB banks

QIB and all other Islamic banks in Qatar also participated in the COVID-19 National Response Program (NRP) launched as part SCCM's decree. QCB set the framework of NRP and instructed the banks to issue the guarantees favoring all the private companies holding accounts on Wage Protection System for guaranteeing the wages and rental payments which are payable over 3 months to a maximum of 2.5 million per month for each entity. Interestingly, the profit rate of the guarantee under the said program was covered by Qatar Development Bank (QDB) to a maximum of 1.5%, and 1% for the first and second six months respectively, and thereafter the profit rate will not exceed 2% + QCB Lending Rate for the second and third years and it shall be borne by the customer (Qatar Central Bank, 2020).

To augment the economic stimulus initiatives, the General Authority of Customs exempted 905 items related to food and medical goods from custom duties for six months. All those items were also cancelled from the electronic custom clearance tool *'alnadeeb'* for effective implementation of the policy (State of Qatar (d), 2020).

6. The Potential of Islamic Finance Industry in Qatar

A total of 20 Islamic financial institutions have a very prominent place in the economy of Qatar and they are performing historically better than the conventional banks (QFC-REFINITIV, 2019). The banking assets held by Islamic banks in Qatar are accounted for 26.1% of total banking assets in the country; also, they comprise 6.1% of global Islamic banking assets. Interestingly, the Islamic banks are not only excelling in their profit earnings but also the Capital Adequacy Ratio and Liquidity Coverage Ratio (LCR) are also sound, the LCR is well above the 100% requirement by BASEL and IFSB (Islamic Financial Services Board, July 2020). The surplus liquidity position in Islamic banking of Qatar is confirming the capability and readiness of Islamic banks in Qatar for their extended contribution to future economic policies and plans.

The Islamic finance industry in Qatar also depends heavily on *Sukuk*. Qatar issued the maiden Formosa *Sukuk* from the GCC in January 2020 (Islamic Financial Services Board, July 2020). Qatar's Formosa *Sukuk* are primary listed in Taiwan since January 2020 and also in Dublin since February 2020. Qatari government had to inject QR10 million to Qatar Stock Exchange as part of stimulus package, whereas the Formosa *Sukuk*, which was initially planned to raise $650 million, ended in raising $800 million due to oversubscription. The successful issuance of Formosa *Sukuk* during the time of pandemic is further endorsing the potential of Qatar's Islamic finance industry in reinforcing and regaining the economic stability of Qatar through geographical diversification.

Takaful industry in Qatar is promising and expected to show further growth due to the massive infrastructure development projects in Qatar for catering to the needs of QNV 2030 as well as the preparation of 2022 FIFA World Cup. The assets of conventional *Takaful* are far greater than the assets of Islamic insurance, the situation of having 45% market share of Islamic insurance by the subsidiaries of conventional insurance (Islamic Financial Services Board, July 2020) assures and amplifies the capacity of Islamic finance industry in Qatar to cater to the needs of systemic risk management of Qatar.

The downward trend in the CPI index of Qatar during last six months imposed by COVID-19 was very acute and sharp in the entertainment sector. Given the fact that most of Qatar's demography is comprising of

Muslims, the Islamic finance industry has a huge potential embodied in funding those Shari'ah compliant entertainment initiatives on the print and broadcasting media which are aimed at promoting cultural and Islamic values.

The government of Qatar has been known for its humanitarian and philanthropic contributions which encompasses the entire world. Recently, the government of Qatar extended a massive assistance package to the Lebanon following the explosion at the Beirut port on Tuesday, August 4, 2020. On the other hand, the economy of Qatar is struggling at the side of public budget, especially in managing the major projects as eluded by the shrinking figures of the MOF public budget. The *Waqf* can ease the pressure on Qatar's public budget by channeling the revenue of *Waqf* for participating actively in the humanitarian and philanthropic initiatives of Qatar's government, while the amounts allocated by government for humanitarian philanthropic initiatives could be redirected to the development projects.

In Qatar, the government institution called '*Zakat* Fund' has played its role during the early phase of COVID-19 by issuing grocery coupons to the employees of low income as well as the labors residing in the industrial area of Qatar. Such act of charity has underscored the potential of Islamic finance industry in Qatar to deal with the emergency situation with the people at the bottom of pyramid; similarly, it also proved that Islamic finance has an emergency buffer for Qatar in case of need.

Table 4: Blended Financing Model for Islamic Finance

Blending model	Structure	Applicable contracts	Islamic participant	Beneficiaries
Concessional Capital	Concessional Capital Debt/Equity	*Murabaha, Mudaraba, Musharaka, Istisna' and Salam*	Multilateral institutions, Islamic Banks and *Waqf* entities	Commercial startups, MSMEs and Agricultural projects
Technical Assistance Funds	Debt/Equity	*Ijara for services and Qard Hassan or Hiba*	Multilateral institutions, Islamic Banks and NBFIs	Microfinance and SRI projects
Guarantee/Risk Insurance	Guarantee / Insurance Debt/Equity	*Kafalah, Wakalah and mortgage*	Islamic banks and *Takaful* companies	Infrastructural projects of clean energy, water and sanitation
Design-Stage Grant	Debt/ Equity Design Grant	Forward lease *and Istisna'*	Multilateral institutions, *Waqf* and *Zakat*	Social enterprises
Results-Based Financing	Debt Grants	*Ijara for services, Murabaha and Hiba*	*Waqf* and *Zakat*	Education, Health & Housing projects

Source: Authors' own

The different structures of blended financing model may better serve the goals of Islamic finance, in case of Concession Capital blending, the Islamic blending participant will offer the finance with preferential rates and, if possible, share the fewer portions of revenues so that the value created will benefit the private participant and the society at large.

Technical Assistance Funds can be better served through *Ijarah* for services where the Islamic blending participant will provide the assistance on not-for-profit basis or on the basis of *Qard Hasaan* based on the payment capacity of the project, while it may offer such services on gratis basis if the situation requires and funds are available.

The Islamic contracts of *Kafalah*, *Wakalah* and mortgage are ideal for proving guarantee to the infrastructural projects, and risk mitigation can

be done by *Takaful* operators with a preferential contribution amount and investment *Wakalah* fee can be waived off.

The seed capital is the biggest challenge for social entrepreneurs, the need can be better served through forward lease and *Istisna'* contracts based on the nature of projects while the entrepreneur will pay the due only in case of success of the project.

Result Based Financing is optimal for the value-based investment projects related to education, health and housing wherein the positive externality spillover has the domino effect on development thus the *Waqf* and *Zakat* funds can better serve the long-term financing needs through the contracts of *Ijarah* and Murabaha so that in adverse situations the returns and capital contribution of the Islamic blending participant can be waived without a harm to the rest of the participants.

The Islamic finance industry in Qatar with their excessive liquidity position has a huge potential to be a part of Public and Private Partnership (PPP) initiative through the blended finance arrangements. The distinct feature of Islamic finance entities participating through blended finance would be the wide range of flexible contracts suitable for both debt and equity financing in different settings that too for a long-term project. For instance, in order to rectify the declining real estate price index, the Islamic bank can replace the funds by government budget through concessional capital blended financing; wherein the Islamic bank would offer the finance to the real estate developer together with the private contracting company on preferential rates. As a result, a high positive impact will surface on government budget in the form of release of pressure from the budget, and on the private sector by assuring the business for a long-term.

7. Conclusion

The stocktaking of COVID-19 hit to Qatar concludes that the quick response by the government of Qatar with due cooperation by all the sectors of Qatar's economy, including the Islamic finance industry, has been successful and enabled the government of Qatar to announce the lifting of restrictions imposed due to the pandemic through 4 gradual phases (Hamad Medical Corporation, 2020). Nevertheless, the United Nations identified the crisis to be much more than a health crisis, it is a human crisis (United Nations, March 2020); the focus of Qatar's government policy, so far has, been on prioritizing health policies and

undertaking economic stimulus packages. Therefore, from the perspective of Islamic finance, the policy making should take due consideration of the objectives of Shari'ah pertaining to the preservation of life and wealth by contemplating on *fiqhi* maxim "الضرورة تقدر بقدرها" i.e., the necessity must be assessed and responded proportionately. So, the response should be proportionate in terms of prioritizing the matters and holistic in setting the long-term strategies for avoiding a global economic recession and to preserving the economy of Qatar for the future generations. Such holistic response shall also include an adequate response to the biodiversity emergency in order to avoid recourse of similar or further worst pandemic. To address the biodiversity emergency and climate degradation issues, Qatar policy makers shall consider the issuance of green *Sukuk* which are well in line with Qatar National Vision of 2030 (QNV-2030) which aims at 'Human', 'Social', 'Economic' and 'Environmental' development.

Eventually, the study suggests that, Islamic insurance (*Takaful*), *Awqaf* and *Zakat* have been resilient to the shocks of COVID-19 and exhibited the stability in their instance, while the economic stimulus package by the government of Qatar played a very crucial role in restoring the resilience to Qatar Stock Exchange and the private sector of the economy. Moreover, the study establishes that Islamic finance industry has a very high potential for reinforcing and regaining the economic stability in the sections of economy that have negatively impacted due to COVID-19. However, the political and economic circuits as explained in section 3.1 impose several challenges to the reformers of Islamic finance in Qatar. Therefore, the realization of the potential of Islamic finance industry, especially for introducing the new policies and implementing the models of blended financing, depends majorly on convincing the ruling family and their representatives in each of those economic circuits in Qatar.

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