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MAPPING THE ECONOMIC GROWTH USING NON-PARAMETRIC APPROACHES: INSIGHTS FROM FINANCIAL AND INSTITUTIONAL QUALITY INDICATORS IN THE SELECTED OIC COUNTRIES.

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Abstract

This study investigates the complex relationship between financial development (FD), institutional quality (IQ), and economic growth (EG) across five selected OIC countries—Malaysia, Indonesia, Pakistan, Saudi Arabia, and Turkey—using a non-parametric approach. Spanning the period from 1990 to 2020 and segmented into pre- and post-Global Financial Crisis (GFC) eras, the study employs scatter plot visualization to identify heterogeneous growth patterns and the role of institutional and financial resilience. The results categorize economies into four distinct typologies: fragile, stagnant, resilient, and governance-led, thereby offering new insights into how differing levels of FD and IQ influence economic performance under external shocks. Findings reveal that countries with strong institutional frameworks and diversified financial systems, such as Turkey and Malaysia, displayed greater economic resilience, while others like Pakistan and Indonesia remained vulnerable due to weak governance and financial fragility. The study contributes to the literature by demonstrating the value of distributional and structure-sensitive non-parametric tools in capturing nuances often missed by traditional econometric models. These insights provide a robust foundation for policy reforms targeting institutional strengthening and financial diversification in the OIC region.

Keywords: Financial Development, Institutional Quality, Economic Growth, Non-Parametric Analysis, OIC Countries, Global Financial Crisis, Economic Resilience.

1. INTRODUCTION

Economies grow fast when their financial institutions are set up effectively. Research studies reveal that economic growth depends on Financial Development (FD), especially if the right institutions support it for savings, loans and investments (Beck et al., 2000; Levine, 2005). Also, a country will only benefit from financial resources when it has strong leadership, laws are followed and regulations are effective (North, 1990; Acemoglu, Johnson, & Robinson, 2001). Organisation of Islamic Cooperation (OIC) nations face the issue even stronger, working with various economic, academic and financial divisions within their countries (Smolo, 2020; Ali et al., 2022). Making the institutions and finances stronger plays a vital role in helping these economies grow and become sustainable.

Even though FD and IQ are seen as vital for economic growth, the way they relate to it can often be irregular and difficult to predict. During the Global Financial Crisis (GFC) of

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2007–2009, many financial and institutional structures were put to the test. Because of the GFC, it was clear that all types of economies faced certain risks which had a big influence on growth, especially in developing markets (Carré & L'œillet, 2018). After going through the crisis, many OIC countries saw slower growth than before, proof that the relationship among finance, growth and institutions deserves review. Growth in global investments and output slowed after the GFC, so it is important to understand how institutions and finance contributed to the resilience of growth during and after the crisis (World Bank, 2018).

Recent studies on FD, IQ and economic growth use panel data regressions (Ali et al., 2022; Nawaz, Iqbal, & Khan, 2014). The models guarantee statistical accuracy, but they often ignore unusual forms and variation that exist in real situations (Ehigiamusoe & Samsurijan, 2021). Furthermore, their models seldom show how the pattern of growth changes depend on the financial and institutional economies in countries. This does not help the OIC, especially since there are big gaps among their nations in terms of administration and finances (Smolo, 2020). Since strong assumptions about a function are not needed with non-parametric approaches, they are particularly useful for finding relationships in different situations. Despite its usefulness, only a few OIC-based studies have used this model to analyze growth and the impact of FD and IQ.

As there was previously no study on this topic using these methods, the present study aims to investigate the relationship between economic growth in some OIC countries and levels of financial depth and intelligence. With this division, we can analyze the effects of the global crisis on different structures and measures used by companies to overcome challenges. The study presents new ideas on how economies with various institutional and financial conditions are able to face global shocks by visual distribution analysis and categorizing them (fragile, stagnant, resilient or those led by good governance). It is meaningful because it expands the analysis of development in the OIC and produces reports that guide policy on how to fortify the economy through strong reforms in both the financial and institutional sectors.

This study addresses the lack of research by studying economic growth in particular OIC countries across various levels of FD and IQ, both in the times before and after the GFC (from 1990 to 2020). The five OIC countries namely Malaysia, Pakistan, Indonesia, Saudi Arabia and Turkey. It permits researchers to analyze the changes in structures and methods used for resilience during the global crisis. With the help of diagrams and classifications, the research explains how countries with diverse institutions and financial systems have faced exogenous shocks. It matters for its combined impact on analysis of development in the OIC and the development of practical advice for making economies more resistant to shocks and uncertainty through reforms of both financial and public policies.

2. LITERATURE REVIEW

Whether FD, the IQ and economic growth are related has been discussed for a long time by economists in both studies and theoretical models. Schumpeter (1911)'s major work

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claimed that financial intermediaries support progress and growth by correctly allocating available capital. King and Levine (1993) showed in an empirical study that FD helps explain the economic growth of countries over years. The idea behind this is that when the financial system functions properly, it makes resources more efficient, boosts saving and increases innovation (Levine, 2005).

Yet, in recent decades, people have focused more on how superior institutions can shape and affect the relationship between finance and the economy. North (1990) argued that the guidelines that shape daily social activities play a major role in affecting the incentives of people, the costs of taking part in productive activities and the development results. In their book, Acemoglu, Johnson and Robinson (2001) argue that economic growth is sustained when institutions secure property and ensure rule of law. Because of this approach, attention has shifted to the connection between different institutional arrangements and the financial sector in influencing economic expansion (Demetriades & Law, 2006).

Following the GFC, experts have begun to question the connection between finance and economic growth. During the crisis, it was noticeable that overexpansion in the financial sector can make the whole system weak (Arcand, Berkes, & Panizza, 2015). According to Carré and L'œillet (2018), the growth-enhancing function of finance is limited and this is more often studied in post-GFC literature. It has also been acknowledged that strong financial institutions help absorb unexpected disruptions from outside. Nations with secure institutions and different types of financial products were better able to fight back against the difficulties of the crisis (Esen & Binatlı, 2017).

Based on research in OIC countries, the outcomes vary since their financial systems and quality of governance are not all the same. In some OIC economies, a high concentration of banks can enhance their financial system, although it means less competition in the financial sector and thus less room for expanded growth. Ali et al. (2022) found that the effect of financial inclusion on OIC members' financial sector depends on IQ and more powerful institutions strongly improve the performance of this sector. Pradhan et al. similarly maintained that improvements in governing develop the economies of low-income nations more than financial development alone can.

Despite this, researchers have found that parametric models based on panel regressions or structural equation modeling are used, mostly to focus on average results. These models are precise, but occasionally they fail to reveal patterns in the distribution or strange connections. There are not many studies exploring how FD and IQ interact to shape the pattern of economic growth. In OIC countries, the difference between countries' abilities and financial means is an urgent concern. As mentioned by Ehigiamusoe and Samsurijan (2021), to effectively respond with policies, the finance–institution–growth nexus should be understood in more specific ways and fit the context.

Therefore, researchers turn to non-parametric tools that make it easy to study real-world relationships without any preconceived assumptions. Looking at the distributions instead of just the means, non-parametric approaches reveal anything that is not uniform,

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symmetric or step-wise in economic data (Silverman, 1986). On the other hand, applying these techniques in the FD–IQ–growth literature, especially in the OIC area, has not been done often. Therefore, this study helps bridge the gap by presenting a non-parametric, distribution study of FD, IQ and economic growth in a set of OIC countries both before and after the GFC.

3. METHODOLOGY

In this section, the analysis using non - parametric scatter plots are employed to explore the preliminary relationships between FD and IQ on economic growth. Scatter plot is one of tools for exploratory data analysis which could denote the association between pairs of variables without any assumed functional form or distribution.

This method is especially helpful for the early phases of analysis as it provides information about likely linear or nonlinear relationships, trends, and outliers in the data, thus suggesting directions of subsequent analyses that may be parametric (Cleveland, 1985).

Also, scatter plot has a visual ability to reveal patterns and correlations between FD, IQ and economic growth. Scatter plots are different from other parametric methods which demand assumption of distribution, linearity of relationships etc., but they are more flexible than parametric methods especially in studies of complex socio-economic variables, in which linearity cannot always be assumed (Chambers, Cleveland, Kleiner, & Tukey, 1983).

This flexibility is essential as it allows to identify potential outliers and influential observations that could attenuate parametric estimations (Zhang, 2016). Thus, scatter plots are most intuitive tool for exploring the relationship between FD, IQ and economic growth in OIC countries without the restrictions due to any pre - defined assumptions.

The utilization of scatter plots for initial data analysis has widely been recognized by previous research in economics and finance.
For example, Chambers et al. (1983) noted that scatter plots play an important role along with some other statistical tools in revealing patterns in economic data which are invisible for conventional statistical procedures. Cleveland (1985) also recommended scatter plot as a robust visualization tool in presenting linear and nonlinear relationship. In the same line with (Zhang (2016), scatter plots are important especially where the data distributions are unknown or when exploring the data for the first time and thus are indispensable means for non-parametric analysis.

4. RESULTS

This section discusses the findings on the Non-Parametric Data observation specifically the preliminary relationships between FD and economic growth in Section 4.3.1.

Then, finding will discuss the preliminary relationship between FD and IQ for the selected OIC countries in Section 4.3.2.

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4.1 Preliminary Relationship between Economic Growth and Financial Development

This section explains the preliminary relationship between economic growth and FD. The data were segregated based on pre-GFC (before 2008) and post-GFC (after 2008).

Based on Figure 1, it has been shown the interaction of FD, IQ and economic growth by using economic categorization of all selected OIC countries before and after the GFC. This analysis further demonstrates the importance of the institutional resilience, and financial systems in weathering external economic shocks by studying these shifts.

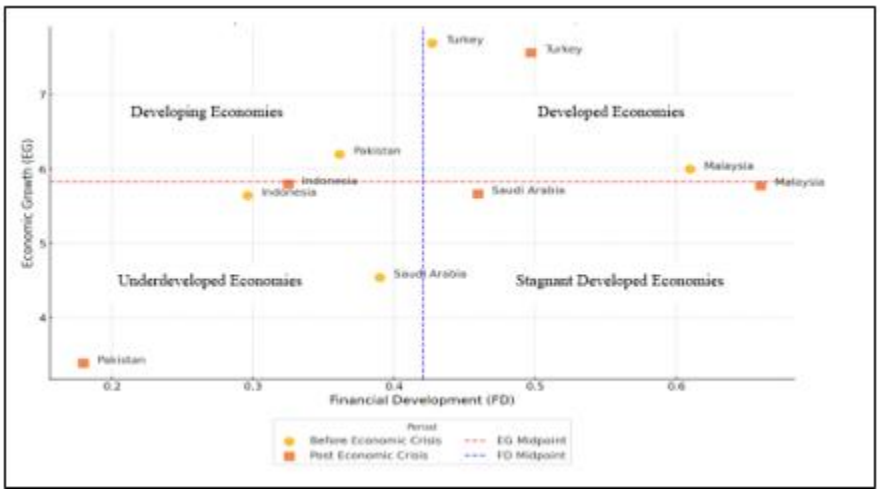

Figure 4.1: Financial Development and Economic Growth for selected OIC Countries.

The selected countries before the GFC were heterogeneous in their economic status, arising from variability in the IQ, FD and the 'structural' make up of such economies. Before the GFC, Indonesia and Saudi Arabia economies went into the crisis as underdeveloped economies. The status of Indonesia's was the result of a weak FD and absent effective institutional mechanisms to sustain the growth (Basri & Hill, 2011). Likewise, Saudi Arabia faced desperate over reliance on hydrocarbons and little diversification of its economic base (Auty, 2001). Problems in these constraints parallel those endured by resource dependent economies that are frequently associated with little IQ (Ross, 2012).

On the other hand, Malaysia and Turkey were declared developed economies that had a high level of FD as well as IQ. Since its creation, Malaysia's success before the GFC can be attribute to its export orient industrialisation strategy and proactive government policies for financial stability (Athukorala, 2014). However, The International Monetary Fund (IMF) documented Turkey's banking system and reforms which included Turkey's efforts to resolve banking problems through macroeconomic stabilization and structural reforms to align with EU and international norms. Pakistan's pre-crisis trajectory as a developing economy characterized by moderate growth position that the Pakistan was one with

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structural weaknesses such as poor governance, fiscal imbalances, and underdeveloped financial systems. Moreover, the IQ of the country itself constrained its ability to generate economic dynamism like other OIC members (Acemoglu & Robinson, 2012).

The GFC became a significant turning point in forging the overall global economic landscape and had its impact on the member OIC countries in diverse ways. But Indonesia and Pakistan were both underdeveloped economies during the post-crisis period. The impact of the GFC lingered for Indonesia exacerbating vulnerabilities in the country's financial markets and institutional structures (Basri & Hill, 2011). Despite political instability and persistent structural challenges, remaining weak IQ foundations Pakistan did not manage to recover from the compounded effects of the crisis.

As for Malaysia and Saudi Arabia, the economic growth of both countries had remained stagnant that they were recognized as "Stagnant Developed Economies." According no Nambiar (2010), Malaysia's financial system weathered the Global Financial Crisis (GFC) relatively well, however, some hard hit as the economy slowed significantly largely due to its reliance on external trade and limited diversification. Malaysia is a small open economy with a strong, export dependent, manufacturing orientation which made it particularly vulnerable to the global downturn. During crisis period, there was a decline in GDP growth due to contraction in aggregate demand and the contraction was particularly pervasive across major trading partners.

Meanwhile, Saudi Arabia has poured significant fiscal expenditures to absorb the shock of the crisis, its economy has become stagnant possibly due to the oil dependency persists and economic reforms have been slow. These findings are consistent with the finding that institutional adaptability, economic diversification foster resilience by Beck et al. (2000) and Kaminsky & Reinhart (1999).

The only country to remain a developed economy in the wake of the crisis, was Turkey. This is largely since it had a diversified economic base, good financial regulation and institutional reforms undertaken before the crisis. Despite the challenges, the country was not able to sustain high growth rates and vulnerability in external debt and currency stability was emerging (Esen & Binatlı, 2017).

Results highlighted important insights of how FD and IQ, as well as their dynamic interplay destination to economic resiliency against the GFC There are thus strong evidence that IQ is an important choice generating factor of resilience; Turkey kept a developed economic status even during and after the crisis. The findings of Acemoglu and Robinson (2012) that stable and sustainable development depend on inclusive institutions are well matched by strong institutional frameworks that allowed stability and economic resilience The weaknesses of Indonesia and Pakistan's institutional foundations were responsible for the weaknesses Indonesia and Pakistan faced in the recovery process in the aftermath of financial crises. The 1997 Asian financial crisis exposed the weakness of institutions in indonesia, which resulted in a longer, more costly, and more painful managing and development road after the crisis. The returns on the capital have come diluted by weak

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financial sector regulation and supervision, which created a misallocation of credit and increased economic shock vulnerability (World Bank, 2004).

Also, in the case of Malaysia and Saudi Arabia, FD played crucial role in mitigating the external shocks. Both countries, while previously in developed status, had stagnated post GFC indicating the vulnerability of over dependence on particular sectors of economic structure. The resource curse thesis put forward by Ross (2012) was reflected, by relying on external trade, and Saudi Arabia reliance on oil revenues made their economies susceptible to global disruptions. Such stagnation reemphasizes the requirement for a more broadened economic foundation to mitigate vulnerability to sector specific risks and external volatility.

4.2 Preliminary Relationship between Economic Growth and Institutional Quality

This section explains the preliminary relationship between economic growth and IQ which present graphically using scatter plot in Figure 2. The data were segregated based on pre-GFC (before 2008) and post-GFC (after 2008). The scatter plot illustrates the interaction between IQ and EG as it is defined for selected countries pre- and post the Global Financial Crisis (GFC). According to these parameters, it separates those countries into four quadrants namely Fragile Growth, Stagnant Economies, Resilient Economies and Governance Led Economies. The analysis underscores the symbiotic relationship between institutions and economic outcomes given how countries have reacted to institutional and economic challenge in response to global shocks, such as the GFC. The quadrants analysis provides a useful way to categorize the way in which countries do and adapt in terms of governance and economics (Acemoglu Johnson, & Robinson, 2005).

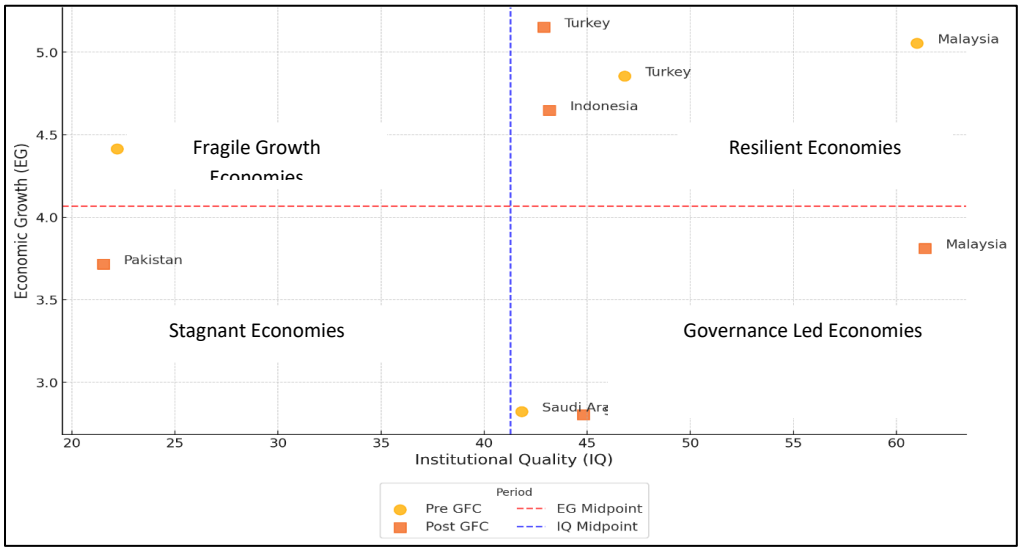

Figure 4.2: Institutional Quality and Economic Growth for selected OIC Countries.

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Pakistan exhibits moderate economic growth prior to and after the GFC but low IQ which located in the Fragile Growth quadrant. This imply that a high degree of economic growth may be reflected by the external factor i.e remittance inflows, informal economic activities and resource dependence rather than powerful institutional foundations (Jalilian et al., 2007). However, this puts in question whether such growth is sustainable, given the inherent vulnerability of it to external and internal disruptions, when institutional foundations are weak. In an environment of IQ limitations, Knack and Keefer (1995) argue that, due to fragile patterns, these institutions make it nearly impossible for a country to attract stable investments and to enforce economic reforms.

Unlike Stagnant Economies, the countries in the quadrant of Stagnant IQ and low Economic Growth are Indonesia and India. That's symptomatic of system governance problems, which prevent economic progress. Weak institutional frameworks often result in weak regulatory contexts, poor public sector governance and corruption that together impede on economic activity (Kaufmann, Kraay, & Zoido-Lobatón, 1999). How important is this quadrant for Indonesia pre and post GFC? Persistently there, it is telling of the absolutely critical need to reform Indonesia's governance to unleash the country’s potential economic. Improving property rights, regulatory quality, and government accountability can significantly enhance long run growth, and addressing institutional deficiencies has been shown to do so (Rodrik, Subramanian, and Trebbi 2004).

On the other hand, countries like Turkey and Malaysia despite varying levels of IQ show higher levels of economic growth than the countries in the other quadrants. The post GFC period may have been sustained by Turkey partly because of its economic diversification and strattgeic geographical position allowing Turkey to trade and invest (Hausmann, Rodrik & Velasco, 2005). However, Malaysia enjoys a strong export driven economy and targeted institutional reforms to improve governance and regulatory quality. These results are consistent with the arguments made by Rodrik et al. (2004) that economic growth may be sustained even when governance is weak so long as macroeconomic fundamentals, sectoral strengths or external economic ties are strong.

In the Governance Led Economies quadrant, countries such as Saudi Arabia stand out as a particular case: with high IQ and robust economic growth. That adds to the power of such synergy: good governance structures promote good economic performance. Acemoglu et al. (2005) emphasizes that for sustained economic growth institutions must guarantee property rights, provide security of property rights and reduce the uncertainty regarding details of future. It appears that the institutional frameworks together with the resource wealth of Saudi Arabia have helped sustain the growth and stability. However, this quadrant points to the need for economic diversification, as were too reliant on resource driven growth it could restrict a long term economically sustainable base.

Overall, the scatter plot shows the importance of IQ determines the distribution of economic outcomes, especially in the face of economic shocks, such as the GFC. Statistics by Kaufmann et al (1999), for example, show that not only does improving IQ help in improving economic resilience but that it facilitates inclusive growth in that it helps to reduce inequality and promotes efficiency. Finally, this analysis provides a primitive

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basis for tackling the interdependencies between economic performance and governance further in order to design targeted policy interventions in the era after the crisis.

5. CONCLUSION

This paper looked into the connection between FD, IQ and EG in five OIC countries by using non-parametric analysis from the years 1990-2020, emphasizing the periods both before and after the Global Financial Crisis (GFC). Political Economy of Growth used scatter diagrams and categories to track how the differences in financial and institutional strength among countries determined how they responded and recovered from various economic shocks.

The evidence proves that a solid foundation of institutions and financial systems contributes greatly to a country's economic stability. Compared to Pakistan and Indonesia, Turkey and Malaysia achieved stability and growth because their financial systems were more diverse and their institutions had improved. Grouping economies into fragile, stagnant, resilient and those driven by governance helped explain how these three factors are related.

Furthermore, the study points out that using non-parametric methods provides important information about different parts of the income distribution and the causes of their weaknesses. Such methods are appropriate for OIC countries, given that assumptions of simplicity and uniformity may not be true there.

Based on the methodology and findings, other areas for further research can be explore more my incorporating OIC members in the country sample and analyze data from after 2020 to see how the COVID-19 pandemic and other recent developments have impacted these nations. It would help better explain the main shifts in financial and institutional structures over a period. Additionally, while describing and modeling the distribution allowed us to draw these findings, incorporating other statistical methods and algorithms in further research could discover more about the nonlinear factors and boundaries involved in the finance–institution–growth link.

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