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Article

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
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Article

Impact of Financial Innovation and Institutional Quality on Financial Development in Emerging Markets

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Abstract: Financial innovation and institutional quality play a key role in financial development. This study investigates the impact of financial innovation and institutional quality on financial development in an emerging markets setting. We used the sample of 17 emerging markets based on the availability of data from the period 1990–2020. Data were extracted from the World Development Indicator database. In this study, panel unit root, fully modified ordinary least squares and Pedroni Integration tests were applied to analyze the data. We find that financial innovation and institutional quality are significantly and positively related to financial development. Better financial innovation increases financial development, whereas low institutional quality in an emerging market can deteriorate financial development.

Keywords: financial development; institutional quality; financial innovation; emerging markets



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1. Introduction

The financial sector plays a central role in economic growth during the distribution of insufficient economic resources. Financial development has been described as policies, factors and institutions that accelerate the effectiveness and efficiency of financial market intermediation (Kutan et al. 2017). Financial development is a method of attaining financial innovation, institutional and organizational improvements in a financial system (Khan et al. 2019a). Many recent studies over the last decade have demonstrated a relationship between financial innovation and economic development (Mollaahmetoğlu and Akçalı 2019). Financial innovation contributes to economic growth by enabling capital mobilization, effective financial intermediation, capital formation, and generally improved effectiveness in financial institutions. As a result, financial innovation is seen as a key driver of financial development (Laeven et al. 2015). Financial innovation, like other types of innovation, is a constant act of integrating changes in the financial sector by improving and diversifying financial goods and procedures (Ang and Kumar 2014). The introduction of new financial resources and infrastructure into the financial system boosts financial services performance and capital market developments, ultimately enhancing growth in the economy (Nazir et al. 2021).

A growing number of studies have shown that institutional quality improves economic growth. In this regard, Kutan et al. (2017) report the role of institutional quality (IQ) by employing data from 21 Middle East and North African countries, in the context of financial development (FD) and economic growth, and show that FD stimulates economic development only in the presence of IQ. A well-developed IQ often contributes to economic growth because it reflects the momentum of economic growth and development (Wang et al. 2014). Furthermore, technological developments are shown as the most considerable components that influence the growth and development of innovation. A sound financial structure is vital for encouraging a country's technological advancement and economic

growth. Financial innovation needs a valuable financial market for reducing and assigning limited resources and for reducing financial costs (Ullah 2019). Financial innovation and institution quality play a dynamic role in financial development. In recent years, researchers have shown much interest in financial innovation. Several researchers have found that more innovative firms grow faster. Innovation helps the firms to increase their efficiency, grow markets and hold their leadership according to market requirements (Ullah 2019). In terms of institution quality, Law et al. (2014), argue that weak institutions appear to distort financial intermediaries' ability to effectively channel capital to fund productive activities.

There are limited studies on the impact of financial innovation and institutional quality on financial development, especially in emerging markets. There is a lack of enough support to analyze financial development based on these two factors together in the perspective of emerging markets. Emerging economies are not as advanced as the economies of G7 and EU countries. Compared to G7 and EU countries, the financial development in emerging markets does not have a developed structure (Arouri et al. 2013). However, emerging economies are in a delicate stage of fast development in which institutional integrity is critical in nurturing profitable outcomes from a quickly growing financial industry. As per Law et al. (2014), nations with varying rates of institutional development exhibit different extents of FD, which may be related to their institutional excellence standard limits. However, Le et al. (2016) contend that institutional quality promotes financial intermediation. As a result, due to the sensitive nature of financial innovations, institutional ownership and financial development in developing economies, this research adds to the current domain of research by offering evidence from emerging regions. Thus, the objective of the study is to analyze the impact of financial innovation on financial development and to determine how institutional quality is related to financial development in emerging markets.

The remainder of this paper is organized as follows: Section 2 provides the literature review and develops hypotheses, and Section 3 outlines the methodology. Section 4 presents the results and Section 5 concludes the study.

2. Literature Review

FD is an essential component of economic growth, and a well-functioning financial system contributes to economic prosperity (Malarvizhi et al. 2019). The financial sector is critical in allocating limited financial resources, and the financial initiatives taken in this system contribute to economic growth (Nyasha and Odhiambo 2017; Mollaahmetoğlu and Akçalı 2019). According to Wang and Tan (2021), financial innovation and institutional advancements in a financial system decrease the amount of information asymmetry, strengthen market conformance, assist intermediaries engaging in monetary operations through (direct or indirect) agreements, streamline operations, and enhance competitiveness. As a result, the scope of FD brings improvements to banking sector services, institutions and enterprises, in addition to the non-banking financial system and equity markets. According to Greenwood et al. (2010), FD permits credit distribution between enterprises, improving investment effectiveness and performance. According to Han and Shen (2015), rapid FD leads to overall factor productivity improvement by eliminating the discrepancies in resource allocation.

A stable and well-functioning financial sector has been a major driving force behind economic development (Ehigiamusoe and Samsurijan 2021). Such a sector creates local savings, which in turn leads to successful local business investments. Consequently, the financial sector has provided the basics for income growth and job creation. According to Tamara et al. (2019), regulation and innovation have a complicated relationship because regulation is the main cause of financial innovation, while innovation is often central to a need for novel guidelines. To be more specific, financial innovation is fueled by technological advancements that alter the financial products, and services and manufacturing processes (Gu et al. 2021). Moreover, businesses enhance financial innovation to increase their competitive advantages.

According to [North \(1990\)](#), institutions are incredibly essential in financial development and have categorized institutions as the norms in a country, comprising institutions and bodies, codes of conduct and behaviors, that are vital for the developmental process. Furthermore, [Knack and Keefer \(1995\)](#) argue that institutional quality boosts the financial system. Some studies, by comparison, show that the democratic control of banks, political economy, and trade openness affect financial development. Furthermore, [Arcand et al. \(2015\)](#) demonstrate that increased financial integration can impede actual economic growth. The effects of foreign investment and trade openness on economic growth are hampered by institutional quality, whereas improvement can reduce the difficulty brought about by trade liberalization to the degree that FDIs resist increasing their spill-over impact ([Huynh et al. 2020](#)). A high-quality institutional framework contributes to the growth of the financial system. The quality of governance is critical for a country's financial sector growth ([North 1991](#)). The expansion of financial institutions increases the number of financial services and stimulates economic progress.

The influence of the institutional quality on the financial growth of various areas and nations has been measured by numerous studies. Quality institutions, openness, and transparency, according to [Levine and Zervos \(1998\)](#), are key contributors to financial development. Similarly, [Law et al. \(2014\)](#) discovered that financial sector development and institutional connections are interdependent but in varied contexts. Moreover, [Hunjra et al. \(2020\)](#) recognized that trade and financial integration foster financial growth, whereas low-quality institutions have a detrimental impact on financial development. However, [Malarvizhi et al. \(2019\)](#) discovered that institutional quality has a significant impact on banking sector growth, which in turn boosts financial advancement. Furthermore, [Ma and Jalil \(2008\)](#) discovered a stronger impact of the connection between the deposit ratio and private sector lending on economic development in Pakistan and China. Furthermore, a country's financial structure encourages technical advancements by providing resources to entrepreneurs, which leads to an increase in growth in the economy ([Becker et al. 2012](#)).

In financial prudence, institutional quality is the center of the performance of the financial sector. The literature shows a positive relationship between institutional quality and financial development. In promoting financial development, institutional quality has gained much attention from researchers in different studies. [Khan et al. \(2019b\)](#) find a positive and significant relation between institutional quality and financial development. Further, it is argued that emerging economies are facing challenges in the expansion of institutional and financial environments. Economies differ in terms of the institution and financial capabilities. Due to the following reasons, countries must focus to learn from the rapidly changing and growing economies. [Fagbemi and Ajibike \(2018\)](#) find that institutional quality influences financial development. In the presence of other factors, [Khan et al. \(2019b\)](#) find that financial development is positively and significantly driven by institutional quality. For financial development, high-quality institutions play an important role. Therefore, to establish stabilized reforms, the study imposed pressure on policymakers to deal with risk and uncertainty. Financial institutions and financial markets are the main pillars of the financial sector and need to be equally monitored ([Abrar et al. 2021](#)). This study argued that institutional quality is one of the major components to foster FD.

Hypothesis 1 (H1). *Institutional quality positively affects financial development.*

To identify the relation between financial innovation (FI) and financial development (FD), a large amount of research has been carried out. Financial innovation-led growth, and the elements of expenditure of R&D, financial innovation (FI), transfer of technology, networking and talent, have been recognized as significant factors that promote FI ([Zhu et al. 2020](#)). Many empirical investigations have proven that financial services strengthen the economy when seen through the lens of Schumpeterian endogenous growth theory ([Dosi et al. 2010](#)). Financial services, according to [King and Levine \(1993\)](#), extend financial activities, raise the pace of wealth generation, and promote financial development;

the emergence of new financial services into a financial sector is the primary outcome of financial innovation. Financial innovation plays a vital role in financial development through boosting financial efficiency in financial institutions. Financial innovation promotes financial growth by delivering new financial products, enhancing economic resource mobilization through efficient payment systems, lowering investment risks, and speeding capital creation. As a result, financial innovation is viewed as a financial growth engine in both developed and emerging nations. According to [Bayar and Gavriletea \(2018\)](#) the expansion of the financial sector accelerates cross-country commerce, wealth creation, and accumulation of capital in an economy. Meanwhile, [Hunjra et al. \(2018\)](#) suggest that financial-sector expansion lowers asymmetric information costs and improves resource mobilization, hence enhancing economic growth.

The literature presents four main possibilities to describe the relationship between financial innovation and financial development. First, the supply-leading hypothesis argues that financial innovation may have a favorable impact on the economic growth of the country. This theory proposes that financial innovation promotes economic growth by hastening the processes of wealth creation, increasing the effectiveness of financial firms, strengthening financial products, and making financial intermediation more efficient. [Kirch and Terra \(2012\)](#) discovered that effective financial intermediation has a substantial impact on Nigerian economic development. Second, according to the demand-leading concept, economic expansion leads to financial innovations in a country. According to this hypothesis, the expansion of business activities, the advancement of the real sector, and expanded domestic and global trade place stress on financial systems to boost payment systems, make financial firms more cost effective, and broaden capital instruments to minimize earnings volatility. Third, the feedback hypothesis indicates that financial innovation and economic development are bidirectionally related. [Moch \(2013\)](#), by comparison, found no correlation between financial innovation and economic development.

[Mollaahmetoğlu and Akçalı \(2019\)](#) found that FI is an important factor for financial development that led to economic growth. Higher financial innovation is associated with higher macro-economic growth. According to [Khan et al. \(2020\)](#), the Chinese government focused on financial innovation using an initiative called “Made in China 2025” to overcome the challenges, develop a strong financial market and foster economic growth. They asserted that technology innovation is a leading factor that encourages financial sector development, and technological invention, which could be more effective because it would subsidize financial sector development. Financial innovation and financial development are positively linked, and their impact increases with the increase in the time horizon. [Ozili \(2018\)](#) indicate a positive effect of financial innovation on financial development in advanced and emerging markets; the expediency of digital finance, and the opportunities it provides to individuals with low and variable income, are often more valuable to them than the higher cost they pay to accomplish receive services from conventional regulated banks. [Rajapathirana and Hui \(2018\)](#) find that financial innovation positively influences FD. [Ramanathan et al. \(2018\)](#) state that FI improves the FD of firms. According to [Bekhet and Latif \(2018\)](#), FI is crucial for balanced growth and FD. Based on the above discussion the following hypothesis is developed.

Hypothesis 2 (H2). *Financial innovation positively affects financial development.*

3. Materials and Methods

We aim to explore the impact of institutional quality and financial innovation on financial development in selected emerging markets. We extracted panel data of 17 emerging market economies (See Appendix A) from the World Development Indicator (WDI) database for the years 1990–2020. We used a set of control variables, i.e., economic growth (EG), trade openness (TO) and foreign direct investment (FDI) based on the extant literature on the topic of financial development. [Nyasha and Odhiambo \(2017\)](#) find a positive and significant relationship between EG and FD. [Nieminen \(2020\)](#) finds that trade openness

expands FD. [Alsmadi and Oudat \(2019\)](#) affirmed a positive relationship between FD and FDI in Bahrain. [Aibai et al. \(2019\)](#) show that FDI positively affects financial development and can improve the financial sector’s development including financial markets. The variables’ description is given in Table 1.

$$(FD)_{i,t} = \alpha + \beta_1(FINV)_{i,t} + \beta_2(IQ)_{i,t} + \gamma_1(EG)_{i,t} + \gamma_2(TO)_{i,t} + \gamma_3(FDI)_{i,t} + \mu_{i,t} \quad (1)$$

where FD is financial development, FI is financial innovation, IQ is institutional quality, EG stands for economic growth, FDI is a foreign direct investment and TO represents trade openness.

Table 1. Variable summary.

Name	Abbr.	Proxies	Supporting References	Data Source
Financial Development	FD	Domestic credit provided by the financial sector (% of GDP)	Khan et al. (2020) ; Mollaahmetoğlu and Akçalı (2019)	World Development Indicator (WDI)
Institutional Quality	IQ	CPIA transparency, accountability, and corruption in the public sector rating (1 = low to 6 = high)	Khan et al. (2020) ; Mollaahmetoğlu and Akçalı (2019)	World Development Indicator (WDI)
Financial Innovation	FI	Research and development expenditure (% of GDP)	Akcali and Sismanoglu (2015) ; Nazir et al. (2021)	World Development Indicator (WDI)
Economic Growth	EG	GDP growth (annual %)	Alsmadi and Oudat (2019) ; Aibai et al. (2019)	World Development Indicator (WDI)
Trade Openness	TO	Trade (% of GDP)	Nieminen (2020) ; Aibai et al. (2019)	World Development Indicator (WDI)
Foreign Direct Investment	FDI	Foreign direct investment, net (BoP, current US\$)	Alsmadi and Oudat (2019) ; Aibai et al. (2019)	World Development Indicator (WDI)

We used the panel unit root test in this study to predict the stationarity of data. The use of panel data unit root tests has become widespread among empirical researchers, and is now a generally recognized argument. Panel unit root tests are used to test the null hypothesis of a unit root for each individual in a panel. These are more powerful than standard time-series unit root tests ([Mollaahmetoğlu and Akçalı 2019](#)), and provide numerous compensations for cross-sectional or time-series data. The panel unit root test has cross-sectional measurements, where subscripts represent individuals, corporations, and republics. It raises the number of freedom levels and trust levels in the obtained outcomes ([Choi 2001](#)). Panel data models can be investigated as two main groups: dynamic models, where the past values of the variables are involved; and static models, where past values of the variables are not included in the models ([Bond 2002](#)).

The Pedroni cointegration test is widely used in panel data regression analysis because it takes care of cross-sectional dependence, especially where the countries have the same outlook (i.e., economic, social, political, etc.). Pedroni suggests numerous tests for cointegration that allow for mixed intercepts and trend coefficients across cross-sections ([Pedroni 1999](#)). The test classifies setups where two or more non-stationary time series are integrated in a way that they cannot diverge from the equilibrium in the long term. These tests are used to classify the degree of sensitivity of two variables to the same average price over a definite period. They allow for the prospect of multiple structural breaks both in the level and trend of a cointegrated panel regression ([Malarvizhi et al. 2019](#)).

The fully modified least squares (FM-OLS) method provides optimum estimates of cointegration regressions ([Phillips and Hansen 1990](#)). This method is used to account for serial correlation impacts. The FM-OLS produces consistent estimation for a small sample size and provides a check for robustness of the results ([Kheifets and Phillips 2021](#)). The FMOLS method is used for approximating a single co-integrating relationship that has a

grouping of I (1). To attain asymptotic effectiveness, this technique adapts least squares to account for serial correlation and test for the endogeneity in the regressors that result from the presence of co-integrating relationships. We do not run it on I (0), which is a stationary series.

4. Results

We report the results of the unit root test, Pedroni integration test, and fully modified least squares test in this section.

In Table 2, the panel unit root test is applied and the results of the panel unit root test taken from Im et al. (2003) for the level and first-difference series of FD, FI, EG, FDI, TO and IQ are presented. According to the Im et al. (2003) test, for all variables, the null hypothesis cannot be rejected at a 1% significance level. Thus, it is rejected by taking the first-difference level, which at 1% significance for all variables, means their probability value is less than the significance level. As this is the precondition of fully modified least squares (FM-OLS), the stationarity of all variables should be at the first difference. In conclusion, the unit root test for panel analysis rejected the hypothesis at the first difference and shows that stationarity of all variables exists for order one.

Table 2. Panel unit root results.

Variables	IPS (Im, Pesran, Shin)				Order of Integration
	Level		1st Difference		
	T-Statistics	p-Value	T-Statistics	p-Value	
FD	10.642	1.190	−5.280	0.000 *	I (1)
FI	−0.632	0.243	−5.409	0.000 *	I (1)
IQ	5.201	1.000	−3.266	0.000 *	I (1)
EG	−0.110	0.447	−7.364	0.000 *	I (1)
FDI	0.432	0.489	−8.330	0.000 *	I (1)
TO	−0.106	0.462	−7.385	0.000 *	I (1)

Note: * shows significance level at 1%. FD is financial development, FI is financial innovation, IQ is institutional quality, EG is economic growth, FDI is foreign direct investment and TO represents trade openness.

In Table 3, to determine the existence of a long-run relationship among variables and after establishing the stationary of these variables, panel Pedroni cointegration techniques were applied because this approach resolves cross-sectional dependencies, especially where the countries have the same outlook (Pedroni 1999). Two models were constructed using panel Pedroni cointegration. We find that variables selected in the models are cointegrated at the significance levels 1% and 5%.

Table 3. Pedroni cointegration results.

Within Dimension	Dependent Variable: FD			
	With No Trend		With Trend and Intercept	
	T-Statistics	p-Value	T-Statistics	p-Value
Panel v-statistics	−3.687	0.967	1.489	0.056 **
Panel PP-statistics	0.936	0.832	−5.256	0.000 *
Panel ADF-statistics	0.197	0.594	−4.667	0.000 *
Between Dimension				
Group PP-statistics	0.208	0.582	−7.204	0.000 *
Group ADF-statistics	0.499	0.691	−3.355	0.000 *

Note: * and ** show significance levels at 1% and 5% respectively.

We report the main hypotheses results in Table 4. We find that financial innovation and institutional quality have a significant positive impact on financial development. When financial innovation is carried out in the long run, it complements the emerging markets and gives a boost to the financial development of emerging markets. A positive relationship between financial innovation (proxied via R&D expenditure) and financial development suggests that, the more countries spend on R&D activities, and hence the promotion of financial innovation, the greater the financial development. In addition, institutional quality shows a positive and significant impact on financial development. Moreover, economic growth and FDI also show a positive and significant relationship with financial development. In contrast, trade openness shows an insignificant and negative relation with financial development.

Table 4. Fully modified least squares (FM-OLS).

Variable	Coefficient	Std. Error	T-Statistic	Prob.
FI	0.011	0.001	18.196	0.000 *
IQ	0.001	0.00002	50.785	0.000 *
EG	0.112	0.006	19.994	0.000 **
TO	−0.013	0.008	−1.587	0.117
FDI	0.012	0.001	17.649	0.000 *

Note: * and ** show significance levels at 1% and 5% respectively. FD is financial development, FI is financial innovation, IQ is institutional quality, EG is economic growth, FDI is foreign direct investment and TO represents trade openness.

5. Discussion

Our findings support Hypothesis 2 and are aligned with the studies of [Akcali and Sismanoglu \(2015\)](#), [Centobelli et al. \(2019\)](#), and [Mollaahmetoğlu and Akçalı \(2019\)](#), who also found a favorable impact of R&D spending on economic growth, and thereby on financial development, in both developed and developing nations. They contend that financial innovation fosters economic growth by introducing new financial products, improves business utilization of resources through streamlined financial transactions, and reduces potential losses. It was verified by [Zhu et al. \(2020\)](#) that financial innovation (FI) is driven by R&D spending, the transfer of technology and networking, and talent among the constituents of FI. According to Schumpeterian endogenous growth theory, financial services boost the economy, as shown in several empirical studies ([Dosi et al. 2010](#)). As a means of improving the efficiency of financial institutions, financial innovation is critical to the advancement of the financial sector. New financial products, improved payment methods, decreased investment risks, and a faster rate of capital generation are all examples of financial innovation at work. In advanced and developing countries alike, financial innovation is therefore seen as a source of financial growth. Our findings support the supply-leading theory, which asserts that financial innovation may have a beneficial effect on the country's economic growth. By accelerating the formation of wealth, enhancing the efficacy of financial enterprises, improving financial products, and making financial intermediation more efficient, this theory asserts that financial innovation fosters economic growth.

Although the results suggest that institutional quality has a positive impact on financial development, these results also indicate that the improvement in the quality of institutions in developing countries has a positive impact on financial development and the overall economy. These outcomes are also supported by the studies of [Ehigiamusoe and Samsurijan \(2021\)](#), [Hunjra et al. \(2021\)](#), and [Khan et al. \(2020\)](#), and also supports Hypothesis 1. According to this previous research, institutions are critical for financial development to drive economic growth since institutional structures can alleviate or exacerbate the informational divergences and processing fees that define financial sector development. Quality institutions, fairness, and transparency are crucial factors in financial

growth according to these studies. Similar findings were made in the banking sector and institutional interconnections by [Law et al. \(2014\)](#), who found that the two are interconnected, although in different situations. Economic growth is stimulated by a country's financial system, which makes it easier for entrepreneurs to invest in new technologies and products. Consequently, they assert that institutions are critical to financial growth and have categorized institutions as the country's governing bodies that are crucial for the development process. They state that the financial system is bolstered by the quality of institutions.

The results tell us that foreign direct investment needs to be increasingly promoted to improve financial development. Economic growth plays a vital role in improving financial development in emerging markets. These results are supported by [Aibai et al. \(2019\)](#) and [Hunjra et al. \(2021\)](#). Increasing trade openness does not positively affect financial development; rather, it can result in emerging markets encountering more risk and burden. This shows that trade openness is not contributing to the financial development of emerging markets although these markets are engaged in greater openness of trade over time. The insignificant outcomes of the relationship between trade openness and financial development are also reported by [Thi Thuy and Nguyen Trong \(2021\)](#). Some studies have shown that democratic oversight of banks, FDI, and trade openness have an impact on financial development. Our results are in line with these findings. Increased financial integration, according to [Arcand et al. \(2015\)](#), can actually inhibit economic progress. Economic development is slowed by poor institutional quality, which may be improved to lessen the difficulties caused by trade liberalization, and hence prevent FDIs from increasing their impact on the economy ([Huynh et al. 2020](#)). The expansion of the financial system is facilitated by a strong institutional foundation. Developing a country's financial industry needs good governance. The rise of financial institutions improves the quantity of financial services available, which in turn boosts the economy.

6. Conclusions

The financial innovation and quality of institutions have an important role in the financial development of emerging markets. The main purpose of the study was to investigate the impact of financial innovation and institutional quality on financial development by considering 17 emerging markets for the period of 1990–2020. Our results show that financial innovation and institutional quality have a positive and significant impact on financial development. Although economic growth and FDI have a positive impact on financial development, trade openness has an insignificant impact on financial development. Institutional quality enhances the long-term welfare of the nation because countries with high institutional quality have better financial development systems. In addition, there is a need for proper management of innovation (technological or financial) decisions because inefficient innovation management can hamper financial development. It is recommended that higher reliance on improvement in the current processes of institutions and innovation in financial development could help emerging economies to meet future needs and to stay competitive in markets. A long-term increase in economic growth can be achieved through encouraging financial innovation and improving institutional quality. Investing in technology and infrastructure to assist financial innovation may be one way to help the financial sector spread and absorb new ideas. Regulators should help foster financial innovation and institutional quality by supporting and articulating institutional and financial policy. Many other indicators of financial development, i.e., the role of environmental quality, CSR, and corporate governance, could be used in future research. Moreover, this study is important from emerging countries' perspectives. This study may be extended by including developed and BRIC economies, and providing a comparative analysis of developed and emerging economies.

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Appendix A. List of Sample Countries

List of Sample Countries		
1. Argentina	7. Iran	13. Saudi Arabia
2. Brazil	8. Korea (rep)	14. South Africa
3. China	9. Mexico	15. Taiwan
4. Egypt	10. Nigeria	16. Thailand
5. India	11. Poland	17. Turkey
6. Indonesia	12. Russia	

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