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Financial Development and Economic Growth: The Role of Institutions in Asian Economies

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Financial Development and Economic Growth: The Role of Institutions in Asian Economies

Pradeep PANTHI*

Abstract

This paper examines the relationship between financial development and economic growth, evaluating the intermediation role of institutions. First, the cross-sectional estimation of sixty economies from 1985 to 2016 under panel least square fixed effects model gauges the previous literature benchmarks and reveals that financial development is positively correlated with economic growth. However, the effects are comparatively better in middle-income economies but weakest in low-income economies. It suggests that the economic growth effects of financial development significantly differ according to countries' economic development stages. Moreover, institutions serve as a mechanism to foster the effects of financial development on economic growth, especially for the upper-middle-income economies, where the institutional quality is comparatively better. Second, this paper evaluates the dynamic relationship between financial development and economic growth, evaluating institutions' intermediation role on their course in fifteen Asian economies. The pooled mean group (PMG) estimations under the autoregressive distributed lag (ARDL) model reveal that financial development and economic growth are cointegrated with bi-directional causality in Asia. However, the causal effects directing from economic growth to financial development are more potent. More particularly, the institutions do not serve as a mechanism to foster the causal effects running from financial development to economic growth; instead, it encourages the effects on the reverse direction. Therefore, policymakers should prioritize improving institutional quality to benefit from financial sector development in Asia.

Keywords: Financial Development, Economic Growth, Institutions, PMG-ARDL, Asian Economies

1. Introduction

The acquisition and interaction of production factors and technological transformations explain the countries' variances in economic growth and productivity. Besides this, financial development and institutional development are also evolving as critical elements of economic growth and productivity in the present globalized world where labour and capital are rapidly moving across the countries (Demetriades and Law 2006). A stable and well-developed financial sector through proper resource

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allocation robustly determines variances in many countries' economic development (Levine 1997). On the other hand, institutions are the integrated social systems that construct their stakeholders' social, political, and economic interaction (North 1991). Strong, inclusive, and transparent institutions make society more peaceful and stimulate economic development in the presence of an efficient legal system.

Many researchers have accepted that a sound and vibrant financial sector effectively mobilize available resources in the productive sector to stimulate economic growth. Still, they have diverse opinions on finance-growth relationships. Indeed, a well-functioning financial sector helps to accelerate the country's economic activities (Durusu-Ciftci et al. 2017). However, it does not mean that expanding the financial system always gives higher economic benefits (Demetriades and Hussein 1996; Rajan and Zingales 2003). Each country has its specific economic features concerning their fiscal policies, financial policies, financial structures, and institutional strengths. For example, the qualities of a country's institutions, such as corruption level, law and order, socioeconomic conditions, and political stability, may affect the causality pattern of finance-growth relationship (Arestis and Demetriades 1997). A country's economic performance would be adversely affected by weak political and legal institutions (Aron 2000; Demetriades and Law 2006). Same as the country's commercial law and financial regulations protecting the property rights and stakeholder's rights determines the quality and growth of the financial sector (Porta et al. 1996). Therefore, recent studies are highlighting more on the intermediating role of institutional quality while investigating the finance-growth relationship.

With a rapidly increasing share of world output, Asia has experienced considerable progress in the financial and institutional sectors since the last three decades. For example, economies like Hong Kong, Singapore, Japan, and South Korea have improved their financial system in terms of capital markets, financial institutions, financial structure, and access. Despite being the main growth driver of the world economy, Asia is home to many poor people. Many Asian economies face challenges in improving their financial system in terms of size, structure, access, and institutional qualities to drive economic growth. Therefore, this study aims to explore the causality dynamics of the finance-growth relationship evaluating the intermediation role of institutional quality on their course in fifteen Asian economies. For this, this study uses the pooled mean group (PMG) estimation under the autoregressive distributed lag (ARDL) model (hereafter, PMG-ARDL). Before deepening into Asia, this study first gauges the previous literature benchmark whether the economic growth effects of financial development significantly differ according to the level of income and institutional quality of an economy or not. For this, the study uses cross-section estimations of sixty economies under the panel least square fixed-effect model.

Section 2 describes the literature review, section 3 presents data and proxy measures, and section 4 explains the econometric approaches and empirical models. Section 5 presents cross-sectional estimations results and discussions of sixty economies. Section 6 presents the PMG-ARDL estimation

results and discussions of fifteen Asian economies only, and section 7 highlights conclusion and policy recommendation. Results obtained from these analyses might help to set clear policies in financial and institutional sector development, especially for developing economies.

2. Review of Literature

2.1. Financial Development and Economic Growth

Historically, the influential studies of Schumpeter (1911) and Hicks (1969) raised the implication of the financial sector to encourage innovations through proper resource allocation in the economic development process. In contrast, Robinson (1952) and Goldsmith (1969) explained that economic development processes promote entrepreneurial activities and stimulate the financial sector. These two perspectives from the pioneer economists have raised a diverse discussion in the literature of finance-growth relationship. Two different hypotheses are widely discussed in the finance-growth relationship. They are, 'finance leading growth' hypothesis and 'growth leading finance' hypothesis. However, Patrick (1966) focused on both hypotheses. He argued that financial development enhances economic growth in pre-stages of economic development, whereas economic growth enhances financial development in the post-development stages. McKinnon (1973) and Shaw (1973) raised the implication of government policies and regulations for developing the financial sector. They stated that financial liberalization enhances savings, encourage domestic investment, and boost economic growth. Revisiting these arguments, Lucas (1988: 6) said that "*the role of the financial sector in economic growth is over-stressed*" in previous studies. However, King and Levine's (1993a) substantial effort confirms that the financial system promotes entrepreneurship by mobilizing savings in innovative and productive activities by diversifying risk and enhance economic growth. Later on, King and Levine (1993b) supported Schumpeter's viewpoint empirically, stating that financial sector development significantly determines the strength of accumulating capital, productivity, and efficiency of economic activities. Firms obtaining finance from external sources and optimizing their capital structure through financial intermediation helps to enhance productivity and growth, positively (Arestis et al. 2001; Rajan and Zingales 1996). The seminal works of Ross Levine and his co-authors with empirical pieces of evidence and broad literature stated that there exist cross-country variances on economic growth concerning size, depth, policies, and access of the financial sector (Levine 1997,2005; Levine and Zervos 1998). However, some evidence shows that finance-growth causality varies concerning economic development stages. For example, Christopoulos and Tsionas (2004) claim that financial intermediation constitutes higher returns on economic activities in the middle stage of economic development. However, Hassan et al. (2011) said that economic growth gives more benefits to the financial sectors in the preliminary economic development phase, especially in weak economies. Despite these diverse opinions, many researchers believe in the constructive linkages

between financial intermediation and economic activities because they grow together, causing each other (Calderón and Liu 2003; Gregorio and Guidotti 1995; Jung 1986; Kar et al. 2011). However, all countries may not benefit equally from the expansion of the financial sector. Instead, the benefits depend on regulatory and supervisory strengths and the effectiveness of the financial policies regarding services, stability, structure, and access. An over-expansion of the financial sector or beyond optimum level might introduce volatility and diminish economic growth (Samargandi et al. 2015; Arcand et al. 2015; Law and Singh 2014; Beck et al. 2014).

Hence, past pieces of literature are enough to conclude that there are many issues of finance-growth linkages to explore. These diverse opinions provide a clear space to reexamine the finance-growth relationship evaluating institutions' intermediation role that differs across the countries.

2.2. Financial Development, Institutions, and Economic Growth

Institutions are emerging as a critical mechanism to achieve and sustain economic development in recent decades. Many empirical pieces of evidence suggest that country's institutional qualities act as social technology where economic stakeholders interact and shape their economic behaviours and stimulate the path of economic development (Nelson and Sampat 2001; Acemoglu et al. 2001; Roland 2004; Berkowitz et al. 2003; Subramanian, and Trebbi 2004). The institutions protecting the property rights of shareholders play a significant role in increasing capital through private ventures and economic activities (Acemoglu et al. 2005; Acemoglu and Johnson 2005; Knack and Keefer 1995). Political institutions shape the characteristics of economic institutions in many countries (Acemoglu and Robinson, 2008). Besides this, a high level of corruption might diminish economic growth (Mauro 1995). Better institutional qualities and public policies determine the strength of accumulating capital by improving productivity and economic efficiency (Hall and Jones 1999). It determines the trade openness of economies in explaining differences in their income levels (Rodrik et al. 2004). Therefore, institutional strengths such as political stability, low corruption, effective bureaucracy, and desirable and enforceable law and order determine the level of economic development in many economies by shaping its stakeholders' economic and financial behaviour.

On the contrary, a bulk of literature, especially after the late 1990s, explains that the financial system itself grows in a sound institutional environment (Afndrianova et al. 2008; Djankov et al. 2007; Khan et al. 2019). For example, the legal system and institutions of an economy determine access to external finance, corporate governance, property rights protection, and strength of financial intermediation (Demirgüç-Kunt and Maksimovic 2002; Beck and Levine 2004). Besides this, economic openness helps to foster financial development in the existence of a competent legal system (Chinn and Ito 2006). The political stability, a vital determinant of the country's institutional strength, robustly determines financial development (Roe and Siegel 2011). Therefore, institutions protecting individual choice, economic exchange, and property rights in the essence of economic freedom motivates

innovation through the financial system triggers economic growth and protect from financial crises.

In light of this literature, we can clearly understand that country's institutional strengths perform a critical role in explaining the causal dynamics of the finance-growth relationship. Financial development contributes significantly to economic development if an economy maintains a specific institutional quality (Law et al. 2013). Similarly, institutional quality reduces uncertainty and encourages investment in the productive sector by stabilizing markets (Law et al. 2018). Thus, the variations in institutional quality indicators and public policies' effectiveness across the countries might determine the causality effects and pattern of finance-growth relationships.

Despite these comprehensive works, few studies examine the significance of institutions on the causal dynamics of financial development and economic growth in the Asian perspective. Many developing economies in Asia are experiencing a comprehensive range of financial and institutional reforms. Their financial and institutional systems are becoming deeper and diversified since the beginning of the 1990s, experiencing economic miracles and financial crises. Hence, the study attempts to explore new evidence on the causal dynamics of finance-growth relationships evaluating the intermediation role of institutional qualities on their course in the Asian context.

3. Data and Proxy Measures

3.1. Data

First, this study evaluates whether the causal effects of financial development on economic growth significantly differ concerning the level of income and institutional quality of the economies or not by estimating a cross-sectional data of sixty economies[1] from 1985 to 2016 using the panel least square fixed-effects model. The selection of economies largely depends on data availability. Economies that have at least 22 years of continuous observations for each variable are only selected, otherwise rejected. Besides this, few oil-exporting economies, few Middle East economies, and small island developing states having a population of less than one million are also excluded. The selected economies are evaluated together and then divided into four income groups following the World Bank's income classifications of economies of July 1,2017. A separate group of fifteen Asian economies out of those sixty economies are also evaluated and compared with other income groups. Second, this study examines the causal dynamics of the finance-growth relationship, evaluating the intermediation role of institutional quality in Asian economies using a panel dataset of fifteen Asian economies from 1985 to 2016 using the PMG-ARDL model. The study depends on World Development Indicators (WDI) of the World Bank to obtain the annual time series data of selected variables other than institutional quality indicators. The political components to calculate the institutional quality index are achieved from the International Country Risk Guide (ICRG) of political risk services (PRS) group, which evaluates 12 different political risk components for 140 countries.

3.2. Proxy Measures

3.2.1. Economic Growth

Economic growth refers to the changes in the gross domestic product (GDP) of an economy. There are particular proxy measures of economic growth. This study uses annual changes in GDP per capita (GDPPC) measured in constant 2010 US dollar as a measure of economic growth. It is calculated by dividing total GDP by midyear population.

3.2.2. Financial Development

Financial development refers to the depth, access, efficiency and stability of a financial system of an economy. It consists of both financial institutions and markets. However, the financial depth variables, such as narrow money and broad money from monetary aggregates, total bank credit and deposit from financial institutions, and stock market capitalization and stock traded from financial markets; ratios to GDP are most common among researchers. This study prefers to use a bank-based financial indicator to measure financial development as most of the Asian economies have bank-based financial system rather than market-based. Therefore, the domestic credit to the private sector (DCP) ratio to GDP has been used to measure financial development. It refers to financial resources provided to the private sector by financial institutions.

3.2.3. Institutional Quality Index

Six PRS components obtained from the ICRG database are gathered together into a single index to calculate the institutional quality of selected economies following Demetriades and Law (2006). They are (i) Government stability, which reflects the political confidence and legislative strengths. (ii) Socioeconomic conditions, which indicate the level of employment, economic security, and poverty. (iii) Investment profile, which indicates the risk, strengths, and weaknesses of business and investment activities. (iv) Corruption, which reflects the business environment, market efficiency, and threats on investment. (v) Law and order, which determine the enforcement capacity and independence of the legal institutions and system to maintain social justice, discipline, and harmony. (vi) Bureaucracy quality, which reflects the ability and expertise to lead the society by implementing public policies, effectively. In the original database, the first three variables are scaled from 0 to 12, the next two from 0 to 6, and the last from 0 to 4. The final institutional quality index (INS) scaled from 0 to 1 is obtained by summing the obtained scores of six indicators and dividing them by their full score of 52. Economies having higher values reflects better institutional quality, and lower reflects the weak.

Many economies are profoundly dependent on international trade to accelerate their economic activities, determining the real sector's magnitude. Therefore, the merchandise trade as a sum of exports and imports ratio to GDP is also used as trade openness (TRD) to control the estimations. Besides this, some economies exercise expansionary fiscal policies through government spending to

make steady economic growth. Therefore, the general government final consumption expenditure ratio to GDP, which reflects the size of the budgetary policy, is also used as the size of government (GOV) to control the estimations. Besides this, inflation reflects the price distortion's effects on an economy and may affect economic and financial activities. Hence, the annual rate of GDP deflator as inflation (INF) is also used. Since the data are in various scales, this study uses natural logarithm transformation for consistent results. The coefficients are considered as their elasticities.

4. Econometric Approach

4.1. Cross-Sectional Estimation: Panel Least Square Fixed Effect Model

This study first uses cross-sectional estimations of sixty economies to investigate whether the causal effect of financial development on economic growth significantly differs according to the level of income and institutional quality or not.

Thus, the empirical models under cross-sectional estimations under panel least square fixed effect approach can be expressed as:

$$LnGDPPC_{i,t} = \alpha + \beta_1 LnDCP_{i,t} + \beta_2 LnTRD_{i,t} + \beta_3 LnGOV_{i,t} + \beta_4 LnINF_{i,t} + \beta_5 (LnDCP \times DumFC)_{i,t} + u_{i,t} \quad \cdots (1)$$

$$LnGDPPC_{i,t} = \alpha + \beta_1 LnDCP_{i,t} + \beta_2 LnINS_{i,t} + \beta_3 LnTRD_{i,t} + \beta_4 LnGOV_{i,t} + \beta_5 LnINF_{i,t} + \beta_6 (LnDCP \times DumFC)_{i,t} + u_{i,t} \quad \cdots (2)$$

$$LnGDPPC_{i,t} = \alpha + \beta_1 LnDCP_{i,t} + \beta_2 LnINS_{i,t} + \beta_3 (LnDCP \times LnINS)_{i,t} + \beta_4 LnTRD_{i,t} + \beta_5 LnGOV_{i,t} + \beta_6 LnINF_{i,t} + \beta_7 (LnDCP \times DumFC)_{i,t} + u_{i,t} \quad \cdots (3)$$

Equation (1), (2), and (3) are the basic regression models where t represents time, i represents the selected economies, and β_s represent parameters to be estimated. LnGDPPC represents per capita GDP constant 2010 US dollar. LnDCP represents the domestic credit to the private sector, LnTRD represents merchandise trade, and LnGOV represents the general government final consumption expenditure. All are ratio to GDP. LnINS is an institutional quality index, and LnINF represents one plus the annual rate of GDP deflator. These proxy measures are converted into natural logarithms as denoted by 'Ln' to measure their elasticities. DumFC represents the dummy variable of binary number one for global financial crises of 2007 to 2009 for all economies and Asian financial crises of 1997 to 1998 for a few selected Asian economies, otherwise zero. The dummy variable is multiplied with financial development's proxy to address Asian and global financial crises on economic growth. The estimated results are reported in Table 3, and discussions are presented in section 5, respectively.

4.2. Panel Data Estimation: Pooled Mean Group (PMG) under the Autoregressive Distributed Lag (ARDL) Model

This study's main objective is to examine the causal dynamics of financial development and

economic growth, evaluating institutions' intermediary role in Asian economies.

The static panel regression methods do not accommodate heterogeneous dynamic adjustments for the long-run equilibrium, especially for the panel settings of (T > N), where the number of the time (T) is higher than the number of cross-sections (N). Therefore, this study uses the PMG-ARDL estimation model developed by Pesaran et al. (1999), which provides the benefit of time series variations for efficiency and provides long-run and short-run coefficients.

In this section, the study uses the neo-classical economic growth model, as explained by Mankiw (1995). Thus, economic growth for the one year is defined as:

$$\Delta LnY_{i,t} = LnY_{i,t} - LnY_{i,t} - 1,\ (i = 1,2,..N) \cdots\cdots (4)$$

In which, LnY is per capita real GDP (constant 2010 US dollar), t represents time, i represents the selected economies, and N represents the number of cross-sections.

PMG-ARDL are standard regressions designed under the panel least square method, which estimates relationship by allowing lag effects for the dependent variable and independent regressors. It allows the intercepts across cross-sections to calculate common coefficients for long-run estimation and provides average short-run coefficients. It further generates cointegrating terms and short-term coefficients separately that differs to each of the cross-section.

The PMG estimation can be expressed as:

$$\Delta LnY_{i,t} = Ø_i ECT_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{i,j} \Delta LnY_{i,t-j} + \sum_{J=0}^{q-1} \delta_{i,j} \Delta LnX_{i,t-j} + \varepsilon_{i,t} \cdots\cdots (5)$$

Where, $ECT_{i,t} = LnY_{i,t} - \beta_i LnX_{i,t}$

In which, Y represents a dependent variable, X represents the regressors, i indicates the number of cross-sections, and t indicates time. p and q represent the selected optimum lags of the dependent variable and regressors, respectively. Ø gives the coefficient for error correction term (ECT). β gives the long-run coefficients of the vectors of regressors, λ denotes the lagged dependent variable coefficients, δ represents short-run coefficients of regressors after reaching convergence, Δ represents first differenced value, and ε represents the error term. Although Pesaran et al. (1999) use a fixed and equal lag length for the dependent variable and regressors, this study determines and uses the optimum lag to make estimations more dynamic using Akaike (1974) information criteria (AIC).

The principle estimation equations (6), (7), (8), and (9) assume that financial development, institutional quality index, and their interaction enhance economic growth. On the contrary, the reverse estimation equation (10), (11), (12), and (13) assumes that the economic growth, institutional quality index, and their interactions enhance financial development. Both hypotheses are controlled by three standard sets of variables, as stated above.

Thus, the empirical models under PMG-ARDL estimation can be expressed as:

$$\Delta LnGDPPC_{i,t} = \alpha + \beta_1 \Delta LnGDPPC_{i,t-j} + \beta_2 LnDCP_{i,t} + \beta_3 \Delta LnDCP_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j}$$
$$+ \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + ECT_{i,t-1} \cdots\cdots (6)$$

$$\Delta LnGDPPC_{i,t} = \alpha + \beta_1 \Delta LnGDPPC_{i,t-j} + \beta_2 LnDCP_{i,t} + \beta_3 LnDCP_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j} + \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + \beta_{10} DumFC_{i,t} + ECT_{i,t-1} \cdots (7)$$

$$\Delta LnGDPPC_{i,t} = \alpha + \beta_1 \Delta LnGDPPC_{i,t-j} + \beta_2 LnINS_{i,t} + \beta_3 \Delta LnINS_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j} + \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + ECT_{i,t-1} \cdots\cdots (8)$$

$$\Delta LnGDPPC_{i,t} = \alpha + \beta_1 \Delta LnGDPPC_{i,t-j} + \beta_2 LnDCP_{i,t} + \beta_3 \Delta LnDCP_{i,t-j} + \beta_4 LnINS_{i,t} + \beta_5 \Delta LnINS_{i,t-j} + \beta_6 (LnDCP \times LnINS)_{i,t} + \beta_7 \Delta (LnDCP \times LnINS)_{i,t-j} + \beta_8 LnTRD_{i,t} + \beta_9 \Delta LnTRD_{i,t-j} + \beta_{10} LnGOV_{i,t} + \beta_{11} \Delta LnGOV_{i,t-j} + \beta_{12} LnINF_{i,t} + \beta_{13} \Delta LnINF_{i,t-j} + \beta_{14} DumFC_{i,t} + ECT_{i,t-1} \cdots\cdots (9)$$

For reverse estimation, the above models are designed as below:

$$\Delta LnDCP_{i,t} = \alpha + \beta_1 \Delta LnDCP_{i,t-j} + \beta_2 LnGDPPC_{i,t} + \beta_3 \Delta LnGDPPC_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j} + \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + ECT_{i,t-1} \cdots\cdots (10)$$

$$\Delta LnDCP_{i,t} = \alpha + \beta_1 \Delta LnDCP_{i,t-j} + \beta_2 LnGDPPC_{i,t} + \beta_3 \Delta LnGDPPC_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j} + \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + \beta_{10} DumFC_{i,t} + ECT_{i,t-1} \cdots\cdots (11)$$

$$\Delta LnDCP_{i,t} = \alpha + \beta_1 \Delta LnDCP_{i,t-j} + \beta_2 LnINS_{i,t} + \beta_3 \Delta LnINS_{i,t-j} + \beta_4 LnTRD_{i,t} + \beta_5 \Delta LnTRD_{i,t-j} + \beta_6 LnGOV_{i,t} + \beta_7 \Delta LnGOV_{i,t-j} + \beta_8 LnINF_{i,t} + \beta_9 \Delta LnINF_{i,t-j} + ECT_{i,t-1} \cdots\cdots (12)$$

$$\Delta LnDCP_{i,t} = \alpha + \beta_1 \Delta LnDCP_{i,t-j} + \beta_2 LnGDPPC_{i,t} + \beta_3 \Delta LnGDPPC_{i,t-j} + \beta_4 LnINS_{i,t} + \beta_5 \Delta LnINS_{i,t-j} + \beta_6 (LnGDPPC \times LnINS)_{i,t} + \beta_7 \Delta (LnGDPPC \times LnINS)_{i,t-j} + \beta_8 LnTRD_{i,t} + \beta_9 \Delta LnTRD_{i,t-j} + \beta_{10} LnGOV_{i,t} + \beta_{11} \Delta LnGOV_{i,t-j} + \beta_{12} LnINF_{i,t} + \beta_{13} \Delta LnINF_{i,t-j} + \beta_{14} DumFC_{i,t} + ECT_{i,t-1} \cdots\cdots (13)$$

In which, LnGDPPC represents GDP per capita constant 2010 US dollar. LnDCP represents the domestic credit to the private sector, LnTRD represents merchandise trade, LnGOV represents the general government final consumption expenditure, and all are ratios to GDP. LnINS represents an institutional quality index, and LnINF represents one plus the annual rate of GDP deflator. Variables are converted in natural logarithm for the consistent estimations. DumFC represents a series of dummy variables of a binary number zero up to the break year and one after the break year, which is used to consider Asian, global, and country-specific financial crises. The structural breaks are obtained by observing intercept breaks with minimum t-statistics developed by Qu and Perron (2007) on the domestic credit to the private sector ratio to GDP of selected economies. Appendix A presents the list of structural breaks and their possible causes of fifteen Asian economies. Finally, the one-year lagged error-correction term (ECT) expressed as $ECT_{i,t-1}$ provides a clear judgment about the cointegrating relationship defining the long-run speed of adjustment towards equilibrium. If an estimated model has a one-year lagged ECT coefficient less than one in negative form and statistically significant, it further approves long-run equilibrium or cointegration. The estimated results are reported in Tables 8 and 9, and discussions are presented in section 6.

5. Empirical Results: Cross-Sectional Panel Least Square Fixed Effect Model

5.1. Data Description and Statistics

A summary of the statistics of sixty economies is reported in Table 1. The included observations vary from 1841 to 1910, depending upon the availability of data. Statistics show that financial development, institutional quality, and economic growth have significant variances across the economies. The maximum GDP per capita is 91,617.28 US dollars and a minimum of 131.65 US dollars. The maximum domestic credit to the private sector is 233%, and the minimum level is 0.00% of the GDP. Thus, the financial sector constitutes a sizeable share of GDP. The institutional quality index scale from 0 to 1 is a maximum of 0.94 and a minimum of 0.11, which indicates that selected economies have significant differences in institutional quality. Trade openness, size of the government, and inflation also have noticeable variance across the economies.

5.2. Correlation Matrix

A correlation matrix of selected variables for sixty economies is presented in Table 2. The domestic credit to private sector ratio to GDP and institutional quality index are correlated with GDP per capita by 76% and 72%. Institutional quality index and the domestic credit to the private sector

Table 1　Summary of Statistics

Detail	GDPPC	DCP	INS	TRD	GOV	INF
Mean	10894.50	0.51	0.56	0.59	0.14	0.38
Median	2668.81	0.29	0.53	0.46	0.14	0.06
Maximum	91617.28	2.33	0.94	4.20	0.48	136.12
Minimum	131.65	0.00	0.11	0.09	0.01	−0.27
Std. Dev.	18104.18	0.50	0.16	0.50	0.05	4.87
Observations	1905	1841	1910	1900	1890	1901

Source: Author's Calculation.

Table 2　Correlation Matrix

Correlation	LnGDPPC	LnDCP	LnINS	LnTRD	LnGOV	LnINF
LnGDPPC	1.00					
LnDCP	0.76	1.00				
LnINS	0.72	0.62	1.00			
LnTRD	0.22	0.29	0.25	1.00		
LnGOV	0.30	0.29	0.39	0.06	1.00	
LnINF	−0.14	−0.21	−0.25	−0.08	−0.05	1.00

Source: Author's Calculation.

are also correlated by 62%. It implies that countries having higher financial development and higher institutional quality have higher per capita GDP. Proxies of trade openness and government size are positively correlated with GDP per capita, whereas inflation is negatively correlated. The correlation among independent regressors shows the absence of high-level multicollinearity in the estimations.

5.3. Estimation Results and Discussions

The estimation results of equation (1), (2), and (3) obtained by panel least square fixed-effect method are reported in Table 3, where the dependent variable is the log of GDP per capita constant 2010 US dollar. The results indicate that the domestic credit to private sector ratio to GDP has a significant and positive effect on real GDP per capita. It means that financial development is significant to affect economic growth positively, but their causal effects are comparatively higher in middle-income economies and Asian economies than others. On another side, the positive but fragile effects of domestic credit to private sector ratio to GDP on GDP per capita in low-income economies implies that there exists a clear gap of expanding financial sector in low-income economies. Institutional quality index individually has higher outcomes on GDP per capita of high-income economies comparing to other income groups, including Asia. Most importantly, the domestic credit to private sector ratio to GDP and institutional quality index are complementary since their interaction term (LnDCP× LnINS) is significant to positively affect GDP per capita in model 3 except for the high-income group. It implies that institutional quality serves as a mechanism or channel of financial development to fosters its effects on economic growth, especially for upper-middle-income and Asian economies where the institutional quality index is comparatively better than other income groups. Besides this, the merchandise trade ratio to GDP has significant and positive effects on GDP per capita. However, the general government final consumption expenditure ratio to GDP is insignificant to cause per capita real GDP except for the high-income economies. Finally, inflation has adverse effects on GDP per capita except for low-income economies.

6. Empirical Results: Pooled Mean Group (PMG) Estimations Under Panel ARDL Model

6.1. Data Description and Statistics

In this section, only fifteen Asian economies are selected to examine the causal dynamism of financial development and economic growth, evaluating institutional quality's intermediation role on their course. A summary of the statistics of fifteen Asian economies is reported in Table 4. The included observations vary from 462 to 480, depending upon the availability of data. Statistics show that financial development, institutional quality, and economic growth have significant differences across Asian economies. The maximum GDP per capita is 53,353.84 US dollars and a minimum of

Table 3 Results of Panel Least Square Fixed Effect Estimation

Dependent Variable: LnGDPPC (Log of GDP per capita constant 2010 US Dollar)																		**Sample:** 1985–2016
Groups	**1. All Economies**			**2. High-Income**			**3. Upper-Middle-Income**			**4. Lower-Middle-Income**			**5. Low-Income**			**6. Asian Economies**		
Variable	**Model 1**	**Mode 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Mode 3**	**Model 1**	**Model 2**	**Model 3**
LnDCP	0.302***	0.300***	0.395***	0.298***	0.268***	0.146***	0.386***	0.392***	0.625***	0.403***	0.402***	0.425***	0.141***	0.144***	0.290***	0.514***	0.503***	0.764***
	(0.012)	(0.012)	(0.018)	(0.021)	(0.019)	(0.031)	(0.029)	(0.029)	(0.072)	(0.025)	(0.025)	(0.051)	(0.015)	(0.015)	(0.040)	(0.040)	(0.041)	(0.068)
LnINS		0.101***	0.340***		0.676***	0.581***		−0.157**	0.390**		0.014	0.063		0.202***	0.598***		0.098	0.692***
		(0.028)	(0.046)		(0.072)	(0.073)		(0.079)	(0.173)		(0.042)	(0.106)		(0.043)	(0.109)		(0.078)	(0.147)
LnDCP × LnINS			0.151***			−0.523***			0.356***			0.032			0.161***			0.414***
			(0.023)			(0.103)			(0.100)			(0.064)			(0.041)			(0.087)
LnTRD	0.249***	0.238***	0.246***	0.327***	0.300***	0.291***	0.396***	0.400***	0.432***	0.127***	0.124***	0.126***	0.211***	0.200***	0.203***	0.316***	0.301***	0.302***
	(0.020)	(0.020)	(0.020)	(0.045)	(0.041)	(0.040)	(0.051)	(0.051)	(0.051)	(0.035)	(0.037)	(0.037)	(0.026)	(0.025)	(0.025)	(0.055)	(0.056)	(0.055)
LnGOV	0.042*	0.043*	0.049**	0.294***	0.246***	0.242***	−0.042	−0.044	0.024	0.024	0.023	0.026	−0.036	−0.024	−0.030	−0.015	−0.024	−0.006
	(0.022)	(0.022)	(0.022)	(0.087)	(0.079)	(0.077)	(0.074)	(0.074)	(0.076)	(0.034)	(0.034)	(0.034)	(0.029)	(0.029)	(0.028)	(0.094)	(0.094)	(0.092)
LnINF	−0.049***	−0.035**	−0.043**	−0.988***	−0.664***	−0.516***	0.010	−0.015	−0.031	−0.009	−0.008	−0.009	−0.255***	−0.198***	−0.204***	−0.264*	−0.258*	−0.280*
	(0.017)	(0.017)	(0.017)	(0.213)	(0.197)	(0.194)	(0.042)	(0.044)	(0.044)	(0.022)	(0.022)	(0.023)	(0.046)	(0.047)	(0.046)	(0.153)	(0.153)	(0.149)
LnDCP × DumFC	−0.017	−0.016	−0.019*	−0.005	−0.034	−0.010	0.016	02.014	0.016	−0.029	−0.029	−0.029	−0.014	−0.011	−0.009	−0.079*	−0.072	−0.096**
	(0.011)	(0.011)	(0.011)	(0.050)	(0.046)	(0.045)	(0.033)	(0.033)	(0.033)	(0.026)	(0.026)	(0.026)	(0.010)	(0.009)	(0.009)	(0.048)	(0.048)	(0.047)
Constant	8.716***	8.771***	8.909***	11.122***	11.178***	11.153***	9.019***	8.927***	9.420***	7.988***	7.995***	8.035***	6.707***	6.891***	7.234***	8.605***	8.626***	8.958***
	(0.046)	(0.048)	(0.052)	(0.158)	(0.145)	(0.141)	(0.144)	(0.151)	(0.204)	(0.078)	(0.081)	(0.114)	(0.065)	(0.075)	(0.114)	(0.210)	(0.210)	(0.217)
R-squared	0.987	0.987	0.987	0.954	0.962	0.964	0.820	0.821	0.826	0.882	0.882	0.882	0.896	0.902	0.906	0.962	0.963	0.964
Adjusted R-squared	0.986	0.986	0.986	0.952	0.960	0.962	0.812	0.813	0.818	0.876	0.876	0.876	0.892	0.898	0.901	0.961	0.961	0.963
S.E. of regression	0.189	0.189	0.186	0.149	0.136	0.132	0.226	0.225	0.222	0.193	0.193	0.193	0.135	0.132	0.130	0.282	0.282	0.275
F-statistic	2021.929	2000.599	2017.904	479.043	549.230	553.704	106.578	101.882	100.154	173.541	164.540	156.450	192.754	193.818	191.648	595.756	566.748	567.107
Prob (F-statistic)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of Cross-sections	60	60	60	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Observations	1831	1827	1827	458	458	458	466	465	465	463	463	463	444	441	441	462	462	462
Country Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: ***, ** and * indicates significance at 1%, 5%, and 10%, respectively. Standard errors are in parentheses.
Source: Author's calculation.

378.49 US dollars. The maximum domestic credit to the private sector is 233%, and the minimum level is 5% of the GDP. Thus, the financial sector constitutes a sizeable share of GDP. The institutional quality index scaled from 0 to 1 is a maximum of 0.93 and a minimum of 0.14. Trade openness, size of the government, and inflation also have noticeable variance across these economies.

6.2. Correlation Matrix

A correlation matrix of the selected variables is presented in Table 5. The domestic credit to the private sector ratio to GDP and institutional quality index are correlated with GDP per capita by 76% and 70%. Besides this, a 68% correlation exists between the institutional quality index and the domestic credit to the private sector ratio to GDP. Thus, countries with a higher level of financial development and institutional qualities have higher GDP per capita in Asia. The rest of the variables other than inflation are also positively correlated with GDP per capita. The correlation among independent regressors shows the absence of high-level multicollinearity in the estimations.

Table 4　Summary of Statistics

Detail	GDPPC	DCP	INS	TRD	GOV	INF
Mean	9439.78	0.75	0.58	0.89	0.11	0.10
Median	2308.09	0.52	0.57	0.56	0.11	0.05
Maximum	53353.84	2.33	0.93	4.20	0.26	4.11
Minimum	378.49	0.05	0.14	0.09	0.04	−0.09
Std. Dev.	13599.73	0.55	0.15	0.86	0.04	0.36
Obs.	480	462	478	480	476	479

Source: Author's Calculation.

Table 5　Correlation Matrix

Detail	LnGDPPC	LnDCP	LnINS	LnTRD	LnGOV	LnINF
LnGDPPC	1.00					
LnDCP	0.77	1.00				
LnINS	0.71	0.69	1.00			
LnTRD	0.48	0.38	0.45	1.00		
LnGOV	0.39	0.35	0.39	−0.04	1.00	
LnINF	−0.32	−0.43	−0.29	−0.07	−0.03	1.00

Source: Author's Calculation.

Table 6　Summary of Unit Root Test

Sample period: 1985 to 2016		**Lag selection Criteria:** Akaike Information Criterion (AIC), Automatic			
		Intercept Only		**Trend and Intercept**	
Variables	Test Methods	Level Value	1st Difference Value	Level Value	1st Difference Value
LnGDPPC	IPS W-Stat	4.13	−8.37***	−0.58	−8.21***
	PP-Fisher χ^2	32	132.82***	40.55*	120.97***
	ADF-Fisher χ^2	42.85*	134.13***	38.1	151.48***
LnDCP	IPS W-Stat	−1.01	−9.69***	−2.88***	−7.57***
	PP-Fisher χ^2	45.83**	152.71***	55.82***	116.16***
	ADF-Fisher χ^2	15.14	228.82***	25.65	234.89***
LnINS	IPS W-Stat	−8.44***	−18.69***	−7.42***	−16.96***
	PP-Fisher χ^2	137.51***	307.09***	121.20***	274.22***
	ADF-Fisher χ^2	169.25***	397.69***	133.59***	1358.45***
LnTRD	IPS W-Stat	−0.9	−14.64***	1.71	−14.03***
	PP-Fisher χ^2	32.65	239.47***	18.86	217.66***
	ADF-Fisher χ^2	34.21	269.56***	21.27	351.18***
LnGOV	IPS W-Stat	−1.88**	−13.14***	−2.55***	−10.76***
	PP-Fisher χ^2	51.36***	206.51***	50.06**	156.43***
	ADF-Fisher χ^2	30.46	228.75***	33.32	417.82***
LnINF	IPS W-Stat	−8.44***	−18.69***	−7.42***	−16.96***
	PP-Fisher χ^2	137.51***	307.09***	121.20***	274.22***
	ADF-Fisher χ^2	169.25***	397.69***	133.59***	1358.45***

Note: ***, ** and * indicates significance at 1%, 5%, and 10%, respectively.
Source: Author's calculation.

6.3. Test of Stationarity

This study confirms the selected variables' stationarity features before performing the estimations using three mostly used unit root tests. They are Augmented Dickey-Fuller (ADF) chi-square test, Phillips Perron (PP) chi-square test, and Im Pesaran Shin (IPS) w-stat test. The summary of the results of the unit root test with two specifications is presented in Table 6. The first specification considers intercepts only, and the second specification considers the trend and intercepts both. Results show that the selected variables have mixed properties, i.e., stationary and non-stationary features in their level value. However, all of them are stationary at their first differenced values in both specifications. It means the selected variables are in the first order of integration, i.e., I (1). Thus, the PMG-ARDL estimations can best fit with the selected variables.

6.4. Lag Selection Method

Table 7 presents the maximum lag selection criteria obtained from the vector autoregressive (VAR) model. Most of the lag selection criteria suggest a maximum lag length of two only. Thus, this study

Table 7　Lag Order Selection Criteria Under VAR

1. Without Interaction Term

Endogenous variables: LnGDPPC LnDCP LnTRD LnGOV LnINF　Sample: 1985–2016
Exogenous variables: C DumFC　Included observations: 417

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−962.9357	NA	7.31E−05	4.666358	4.763075	4.704596
1	2716.026	7234.408	1.79E−12	−12.85864	−12.52013	−12.7248
2	2847.089	254.5839	1.08E−12*	−13.36733*	−12.78703*	−13.13791*
3	2871.643	47.10479*	1.08E−12	−13.36519	−12.5431	−13.04017

2. With Interaction Term

Endogenous variables: LnGDPPC LnDCP LnINS LnDCP×LnINS LnTRD LnGOV LnINF　Sample: 1985–2016
Exogenous variables: C DumFC　Included observations: 417

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−655.857	NA	5.86E−08	3.212744	3.348147	3.266277
1	3686.239	8496.763	6.69E−17	−17.37764	−16.76833	−17.13675
2	3841.187	298.0061	4.03E−17*	−17.88579*	−16.80256*	−17.45753*
3	3882.703	78.45132*	4.18E−17	−17.84989	−16.29275	−17.23426

Note: * indicates maximum lag order selected at a 5% significance level. LR: Likelihood Ratio; FPE: Final Prediction Error; AIC: Akaike Information Criterion; SC: Schwarz Information Criterion; HQ: Hannan-Quinn Information Criterion; and C: Constant.
Source: Author's calculation.

prefers the Akaike Information Criterion (AIC) to automatically select optimum lags within the lags, as suggested by VAR.

6.5. Estimation Results and Discussion

The results of PMG-ARDL principle estimation for the equation (6), (7), (8), and (9) are presented in Table 8, where the first difference of log of GDP per capita constant 2010 US dollar is the dependent variable. The results show that the domestic credit to private sector ratio to GDP is cointegrated with GDP per capita once the effects of financial crises are addressed in model 2. Results indicate that the domestic credit to private sector ratio to GDP is significant to cause GDP per capita positively in Asia. The coefficients of the one-year lag of error correction term ECT (−1) of −0.016 in model 2 suggest a low speed (1.6%) of adjustments towards long-run equilibrium or convergence on the economic growth if a shock happens in Asia. The estimated results in model 3 indicate that institutional quality index individually is insignificant to foster GDP per capita in Asia. More importantly, the interaction term between the domestic credit to the private sector ratio to GDP and institutional quality index (LnDCP ×LnINS) introduced in model 5 is insignificant to cause GDP per capita. It implies that institutional quality does not serve as a mechanism or channel of financial development to foster its effects on economic growth. Now, the outcomes are just opposite to the static regression estimations of table

Table 8　PMG-ARDL Estimation Results for Economic Growth

Dependent Variable: ΔLnGDPPC (Log of GDP per capita constant 2010 US Dollar)				**Sample:** 1987 to 2016	
Models: Selected Lags:	**Model 1** (2, 2, 2, 2, 2)	**Model 2** (2, 2, 2, 2, 2)	**Model 3** (2, 2, 2, 2, 2, 2)	**Model 4** (2, 2, 2, 2, 2)	**Model 5** (2, 2, 2, 2, 2, 2)
Variables:			**Long Run Equation**		
LnDCP	0.526*** (0.178)	1.141*** (0.196)		−0.037 (0.483)	−1.601*** (0.633)
LnINS			0.249 (0.189)	2.539* (1.434)	1.195 (0.843)
LnDCP × LnINS					−0.334 (0.484)
LnTRD	0.363** (0.159)	0.961*** (0.310)	0.042 (0.208)	−0.877 (0.586)	
LnGOV	−3.342*** (0.734)	−2.153*** (0.558)	−1.23*** (0.438)	−9.28* (4.736)	−0.552 (0.372)
LnINF	−15.844*** (3.144)	−1.988 (1.464)	−15.171*** (3.035)	−13.01* (6.373)	−15.241*** (3.546)
Variables:			**Short Run Equation**		
ECT (−1)	−0.008 (0.006)	−0.016* (0.009)	−0.01*** (0.004)	−0.001*** (0.003)	−0.013** (0.005)
ΔLnGDPPC (−1)	0.382*** (0.085)	0.331*** (0.082)	0.382*** (0.067)	0.277*** (0.099)	0.244** (0.099)
ΔLnDCP	−0.035 (0.024)	−0.026 (0.020)		0.002 (0.026)	−0.068 (0.051)
ΔLnDCP (−1)	−0.009 (0.015)	−0.012 (0.018)		0.01 (0.016)	−0.032 (0.049)
ΔLnINS			0.019 (0.016)	0.049* (0.027)	0.056 (0.099)
ΔLnINS (−1)			−0.043** (0.020)	−0.057** (0.024)	−0.027 (0.077)
Δ(LnDCP × LnINS)					−0.164 (0.112)
Δ(LnDCP (−1)×LnINS (−1))					−0.241 (0.151)
ΔLnTRD	0.042*** (0.019)	0.027 (0.020)	0.027 (0.020)	0.032 (0.023)	
ΔLnTRD (−1)	−0.001 (0.020)	−0.011 (0.020)	−0.004 (0.017)	0.000 (0.015)	
ΔLnGOV	−0.188*** (0.065)	−0.171** (0.069)	−0.202*** (0.069)	−0.201*** (0.068)	−0.19*** (0.071)
ΔLnGOV (−1)	0.111** (0.047)	0.098*** (0.036)	0.097** (0.043)	0.080 (0.051)	0.085 (0.063)
ΔLnINF	−0.016 (0.060)	−0.046 (0.085)	0.019 (0.067)	−0.052 (0.051)	0.021 (0.065)
ΔLnINF (−1)	−0.009 (0.063)	−0.020 (0.053)	0.049 (0.066)	−0.031 (0.063)	0.051 (0.071)
DumFC		−0.013 (0.008)		0.007 (0.006)	0.023 (0.019)
Constant	0.040 (0.013)	0.106** (0.043)	0.094*** (0.029)	0.014 (0.042)	0.12** (0.051)
Mean dependent var.	0.038	0.038	0.038	0.038	0.038
SE of regression	0.020	0.020	0.021	0.019	0.019
Sum squared resid.	0.117	0.116	0.133	0.089	0.091
Log-likelihood	1259.90	1263.40	1290.80	1323.30	1312.20
Akaike info criterion	−4.722	−4.673	−4.733	−4.798	−4.750
Included observations	432	432	444	432	432

Note: ***, ** and * indicates significance at 1%, 5%, and 10%, respectively. Standard errors are in parentheses.
Source: Author's calculation.

Table 9　PMG-ARDL Reverse Estimation Results for Financial Development

Dependent Variable: ΔLnDCP (Log of domestic credit to the private sector ratio to GDP)				**Sample:** 1987 to 2016	
Models:	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Selected Lags:	(2, 2, 2, 2, 2)	(2, 2, 2, 2, 2)	(2, 1, 1, 1, 1)	(2, 2, 2, 2, 2, 2)	(2, 2, 2, 2, 2, 2)
Variables:			**Long Run Equation**		
LnGDPPC	0.169***	1.059***		1.034***	1.355***
	(0.090)	(0.078)		(0.075)	(0.120)
LnINS			0.44*	0.013	−3.895***
			(0.245)	(0.088)	(1.201)
LnGDPPC×LnINS					0.499***
					(0.153)
LnTRD	0.416***	0.517***	0.304**	0.57***	
	(0.131)	(0.102)	(0.124)	(0.111)	
LnGOV	−0.658**	0.236*	−1.523***	0.293**	−0.298*
	(0.319)	(0.133)	(0.322)	(0.142)	(0.178)
LnINF	−14.227***	−2.308***	−10.901***	−2.123***	−4.298***
	(2.402)	(0.592)	(1.982)	(0.583)	(0.885)
Variables:			**Short Run Equation**		
ECT (−1)	−0.088***	−0.221***	−0.100***	−0.226***	−0.165***
	(0.028)	(0.045)	(0.023)	(0.052)	(0.036)
ΔLnDCP (−1)	0.117**	0.077	0.177**	0.062	0.050
	(0.057)	(0.054)	(0.072)	(0.052)	(0.073)
ΔLnGDPPC	0.151	−0.268		−0.105	0.030
	(0.426)	(0.445)		(0.414)	(0.690)
ΔLnGDPPC (−1)	0.406	−0.377		−0.223	−0.042
	(0.406)	(0.622)		(0.813)	(0.791)
ΔLnINS			−0.016	0.030	3.172
			(0.061)	(0.169)	(3.429)
ΔLnINS (−1)				0.254**	−0.489
				(0.122)	(4.289)
Δ(LnGDPPC×LnINS)					−0.396
					(0.424)
Δ(LnGDPPC(−1)×LnINS(−1))					0.191
					(0.518)
ΔLnTRD	−0.062	−0.088	0.018	−0.053	
	(0.092)	(0.072)	(0.058)	(0.076)	
ΔLnTRD (−1)	−0.142*	−0.175***		−0.192***	
	(0.079)	(0.052)		(0.058)	
ΔLnGOV	−0.127	−0.001	0.037	−0.101	−0.004
	(0.160)	(0.125)	(0.112)	(0.124)	(0.142)
ΔLnGOV (−1)	0.057	−0.047		−0.048	0.076
	(0.116)	(0.093)		(0.089)	(0.102)
ΔLnINF	0.506	0.234	0.155	0.087	0.214
	(0.420)	(0.297)	(0.169)	(0.234)	(0.326)
ΔLnINF (−1)	0.289	−0.002		0.076	0.068
	(0.194)	(0.176)		(0.215)	(0.264)
DumFC		−0.146***		−0.209***	−0.089***
		(0.027)		(0.077)	(0.0310)
C	−0.23**	−1.700***	−0.27***	−1.612***	−1.983***
	(0.091)	(0.356)	(0.064)	(0.404)	(0.448)
Mean dependent var.	0.026	0.026	0.030	0.030	0.030
SE of regression	0.098	0.089	0.100	0.080	0.090
Sum squared resid.	2.799	2.227	3.860	1.750	1.820
Log-likelihood	619.11	682.79	557.34	721.10	746.27
Akaike info criterion	−1.949	−2.159	−1.940	−2.190	−2.300
Included observations	432	432	432	432	432

Note: ***, ** and * indicates significance at 1%, 5%, and 10%, respectively. Standard errors are in parentheses.
Source: Author's calculation.

3. It means the changes in institutional quality is insufficient to stimulate the effects of financial development on economic growth, or institutional characteristics itself might absorb the impact of financial development also.

The reverse estimation results of PMG-ARDL for equation (10), (11), (12), and (13) are presented in Table 9, where the first difference of log of domestic credit to the private sector ratio to GDP is the dependent variable. The results show that GDP per capita constant 2010 US dollar is cointegrated with the domestic credit to the private sector ratio to GDP once the effects of financial crises are addressed in model 2. Results indicate that GDP per capita is significant to cause the domestic credit to the private sector ratio to GDP positively in Asia. The coefficients of the one-year lag value of error correction term ECT (−1) of −0.221 in model 2 suggest a high speed (22.1%) of adjustment towards long-run equilibrium or convergence the financial development if a shock happens in Asia. The estimated results of model 3 indicate that the institutional quality index is individually significant to foster the domestic credit to the private sector ratio to GDP in Asia, which implies that Asia's institutional development process benefits the financial sector. More importantly, the interaction term of GDP per capita and institutional quality index (LnGDPPC×LnINS) introduced in model 5 is significant to cause domestic credit to the private sector ratio to GDP. It implies that institutional quality serves as a mechanism or channel through which the economic growth may foster its effects on Asia's financial development. It suggests that when the economy performs well in a better institutional environment, the financial sector grows more. This finding is the new evidence often ignored in past studies while examining the finance-growth relationship in terms of institutional quality.

Tables 8 and 9 also provide the average short-run coefficients and common cointegrating terms as they differ across the cross-sections. However, they depend on the number of automatically selected lags. The results suggest that financial development, institutions, and economic growth do not have short-run causality in Asian economies. It justifies that economic growth and financial development activities do not respond quickly to each other individually or endogenously interacting with the institutional quality index.

7. Conclusion and Policy Recommendation

This study first gauges the previous literature benchmark that whether the effects of financial development on economic growth significantly differ concerning the level of income and institutional quality of an economy or not. Second, it focuses on the causal dynamics of financial development and economic growth, evaluating institutional quality intermediation in their course in fifteen Asian economies.

First, the cross-sectional estimations of sixty economies under panel least square fixed effects estimations confirm that financial development is significant and positive to cause economic growth.

However, the causal effects are comparatively better in middle-income economies than others. It implies that the economic growth effects of financial development significantly differ according to the economic development stages. The weakest influence of financial development on economic growth in low-income economies implies that low-income economies should expand their financial services to benefit from economic growth. The institutional quality that differs across countries is vital to fostering financial development effects on economic growth, which is remarkable in the upper-middle-income economies, where the institutional quality index components are comparatively better than others. It implies that institutional quality serves as a mechanism to foster financial development on economic growth.

Second, the PMG-ARDL estimations of fifteen Asian economies reveal that financial development and economic growth are cointegrated with bi-directional causality in Asia. However, the causal effects originating from economic growth to financial development are more potent while addressing Asian and global financial crises. The study concludes that economic growth triggers financial development in the preliminary phases of economic development, as most Asian economies are developing economies. These results are similar to the findings of Gregorio and Guidotti (1995); Hassan et al. (2011); King and Levine (1993a). More particularly, the institutional quality index individually and endogenously with financial development is insignificant to cause economic growth in Asia. It suggests that there is much more space to enhance institutional development in this region to get more economic growth benefits of financial development. Therefore, policymakers should focus on setting a clear policy to enhance institutional qualities by which financial activities operate efficiently and foster economic growth. If financial institutions mobilize available resources and channel it to the most productive sector in a sound institutional framework, then a country can achieve stable economic growth. Besides this, the results of reverse estimation models imply that the institutional quality index serves as a channel of economic growth to foster its impact on financial development. When the economy performs well in a better institutional environment, the financial sector gets more opportunities to grow.

Trade openness has a multidimensional role in enhancing domestic credits to the private sector and real GDP per capita in Asia. It means the country's openness to trade integration may enhance financial development and economic growth. So, the policymakers should formulate effective policies to strengthen the triangular relationship between financial development, international trade, and economic growth. However, the negative coefficient of general government final consumption expenditure implies that over-expansion of fiscal spending on consumption expenditure rather than capital expenditure does not enhance economic growth. Additionally, the negative coefficients of inflation on both sets of estimations imply that inflation is highly sensitive to financial development and economic growth. Price distortions increase the cost of funds in an economy and narrow down the investment level. So, the government must have control over inflation to stabilize its financial and economic activities.

For further research, it is possible to increase the number of countries by minimizing the study periods to address more recent financial and institutional development phenomena of Asian economies. The study may be broken down into different phases, such as before and after the Asian financial crises. This study captures financial development measure by only one variable that indicates the financial depth of an economy. Further research can be done by using various aspects of financial development, such as financial efficiency, stability, and access. Besides this, the study has used a single index of institutions by adding six different institutional quality components to evaluate institutions' role on finance-growth nexus. It can be done by evaluating the effects of those components one by one. The economic development stages and level of institutional quality significantly vary according to developing regions also. Hence, a comparative study can be done by evaluating institutions' intermediation role in finance-growth nexus on a regional basis.

Note

1 Out of 60 economies, Guinea for the year 1999 and Vietnam for the year 1994 do not have an observation for domestic credit to private sector ratio to GDP. Therefore, a linear interpolation is being done to fulfil these missing observations before taking natural logarithms.

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Appendix A　Structural Breaks

Intercept Breakpoint: Log of the Domestic Credit to the Private Sector Ratio to GDP (at level value)

Sample: 1985–2016

Country	T-stat	Probability	Break year	Lags	Possible causes
Bangladesh	−4.558044	0.0626	1991	2(2)	The financial sector reform program
China	−4.164901	0.159	2005	1(2)	Constitution amendment in 2004
Hong Kong	−2.757159	0.7819	1998	1(2)	Asian financial crises
India	0.101369	> 0.99	2009	0(2)	Global financial crises
Indonesia	−8.644953	< 0.01	1998	0(2)	Asian financial crises
Japan	−5.365253	< 0.01	2000	2(2)	Lost decade (2001–2010)
Korea, Rep.	−1.954113	0.9412	2009	0(2)	Global financial crises
Malaysia	−0.182367	> 0.99	1999	2(2)	Asian financial crises
Mongolia	−2.415748	0.8735	1995	2(2)	The financial sector reform program
Pakistan	−3.66448	0.3676	2008	0(2)	Global financial crises
Philippines	2.409694	> 0.99	1997	2(2)	Asian financial crises
Singapore	−2.821055	0.7595	2002	0(2)	Dot-com bubble crash and the September 11 attacks
Sri Lanka	−2.522067	0.8495	2007	0(2)	Global financial crises
Thailand	−3.428036	0.4828	1998	0(2)	Asian financial crises
Vietnam	−3.378029	0.5096	2010	0(2)	Large domestic defaults and financial frauds

Note: Numbers in parenthesis indicate maximum lags included.
Source: Author's calculation.