

# Financial Development and Economic Growth in Emerging Asian Countries

Yılmaz Bayar<sup>1</sup>

<sup>1</sup> Faculty of Business, Karabuk University, Karabuk, Turkey

Correspondence: Yılmaz Bayar, Faculty of Business, Karabuk University, Karabuk, Turkey. Tel: 90-370-433-8262. E-mail: yilmazbayar@karabuk.edu.tr

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## Abstract

Many countries removed constraints on goods, services and capital gradually after fall of Bretton Woods system and globalization of financial markets accelerated especially as of 1980s. This process contributed to the development of financial sectors in many countries. Therefore many studies have been conducted about the possible effects of financial sector on major macroeconomic variables in recent years. This study investigates the possible effects of financial sector development on economic growth in emerging Asian countries during the period 1992-2011 by panel regression. We found that various indicators representing the development of banking sector and stock market had positive effect on economic growth in emerging Asian countries.

**Keywords:** financial development, economic growth, emerging Asian countries, panel regression

## 1. Introduction

Financial sector essentially composes of establishments which are an intermediary between economic units with fund surplus and economic units with fund deficits. The financial intermediary and financial instruments have developed significantly over time in parallel with technological progress and economic development. Financial sector also enables economic units to hedge against various risks and to smooth their intertemporal expenditures. Therefore financial sector has become a key component of economies over time. However development level of financial sector varies substantially depending on economic development level of countries. Countries with higher economic development level generally have higher financial development.

The theoretical studies on the relationship between development of financial sector and economic growth traced to Bagehot (1873). Bagehot (1873) emphasize that capital mobility was crucial for economic growth. Then Schumpeter asserted that financial intermediaries contributed to the technological progress and economic development by mobilizing funds, facilitating the trade of goods and services, risk management, project and manager evaluation (King and Levine, 1993). Levine (1997) demonstrated that financial sector had effect on economic growth by accumulation of capital and technological advance in context of the endogenous growth models. Meanwhile many empirical studies for example Goldsmith (1969) and King and Levine (1993) indicated that there were high correlation between economic growth and development of financial sector. On the other hand Robinson (1952) and Lucas (1988) contradicted with Bagehot and Schumpeter. Robinson (1952) asserted that economic growth led financial development. Lucas (1988) indicated that the economists overemphasize the effect of financial sector development on economic growth.

Emerging Asian countries have been the countries among the most rapid growing countries in the world in recent three decades and they experienced significant economic growth rates except the crises times such as 1997 Asian crisis and the Global financial crisis. Their financial sector also has developed during the economic expansion especially since early 1990s. This study investigates the role of development of financial sector on economic growth in Emerging Asian markets (China, India, Indonesia, Korea, Malaysia, Philippines, Thailand) during the period 1992-2011 by panel regression.

In the rest of the study we will review literature on the relationship between development of financial sector economic growth in the Section 2 and give information about data and presents econometric application and main findings in the Section 3 and conclude the study in the Section 4.

## 2. Literature Review

There have been extensive studies on the possible effects of development of financial sector including development of banking sector and stock market on economic growth in the literature. In these studies, money and quasi money (M2), liquid liabilities of the financial sector (M3), total assets of deposit money banks (commercial banks and other deposit taking banks), domestic credit to private sector and interest rate spread have been generally used for the development of banking sector, while total stock market capitalization, value traded and turnover ratio have been used for the stock market development. On the other hand real GDP growth rate and growth rate of real GDP per capita have been used for the economic growth.

The studies on the effects of development of financial sector on the economic growth have reached mixed findings as seen in Table 1. Most of the studies have reached the finding that development of financial sector has had positive effect on economic growth and there has been unidirectional causality from development of financial sector to economic growth. But however some empirical studies such as Kagochi et al. (2013), Yıldırım et al. (2013) and Hakeem and Oluitan (2013) found that there has been unidirectional causality from economic growth to financial development. On the other hand relatively few studies such as Adusei (2013) and Al-Malkawi et al. (2012) found that development of financial sector has had negative effect on economic growth.

Table 1. Literature review

Study	Country/Country Group (Study Period)	Method	Main Findings
Goldsmith (1969)	35 countries (1860-1963)	Correlation analysis	He determined a positive correlation between output and development of financial sector.
King and Levine (1993)	80 countries (1960-1989)	Contemporaneous regressions and sensitivity analyses	They determined a strong correlation between economic growth and development of financial sector.
Demirguc-Kunt and Levine (1996)	44 countries (1986-1993)	Panel data analysis	They reached the finding that development of stock market had a positive effect on economic growth.
Levine and Zervos (1998)	47 countries (1976-1993)	Panel data analysis and sensitivity analyses	They found that development of banking sector and liquidity of stock market had a positive correlation with accumulation of capital, productivity growth and future and current economic growth.
Levine et al. (2000)	74 countries (1960-1995)	Cross-sectional analyses and dynamic panel techniques	They reached a finding that financial intermediary had a positive effect on economic growth.
Sinha and Macri (2001)	8 Asian countries (India, Japan, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand) (1950-1997 (different periods for different countries))	Panel regression and Granger causality test	They reached a positive relationship between economic growth and development of financial sector in India, Malaysia, Pakistan and Sri Lanka. On the other hand there was bidirectional causality between income and development of financial sector in India and Malaysia; unidirectional causality from income to development of financial sector in Japan and Thailand, unidirectional causality from development of financial sector to income in Pakistan, Philippines and Korea.
Bloch and Tang (2003)	75 countries (1960-1990)	Time-series analysis	They found that there existed no significant relationship between economic growth and development of financial sector.

Study	Country/Country Group (Study Period)	Method	Main Findings
Rioja and Valev (2004)	74 countries (1961–1995)	Generalized method of moments, dynamic panel techniques	They found that the relationship between economic growth and development of financial sector varied according to the development level of financial markets. The effect was positive in the countries with middle and high development levels of financial markets, while the effect was unclear in the countries with very low development levels of financial markets.
Jeanneney et al. (2006)	China (1993–2001)	Generalized method of moment system estimation	They reached the finding that development of financial sector affected productivity growth positively.
Backé et al. (2007)	Central and Eastern Europe countries (1993-2006)	Panel co-integration	They reached the finding that development of financial sector affected economic growth positively.
Abu-Bader and Abu-Qarn (2008)	Algeria, Egypt, Israel, Morocco and Tunisia (1960–2004 (different periods for different countries))	Augmented vector autoregression methodology of Toda and Yamamoto	They determined a unidirectional causality from development of financial sector to economic growth except Israel.
Caporale et al. (2009)	Bulgaria, Czech. Rep., Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia (1994-2007)	Augmented Barro-growth regression model.	They found that banking sector increased economic growth, but stock markets had relatively little effect on economic growth. On the other hand there existed unidirectional causality from development of financial sector to economic growth.
Perera and Paudel (2009)	Sri Lanka (1955-2005)	Johansen co-integration and Granger causality tests	They reached the finding that there existed bidirectional causality between economic growth and M2.
Wong and Zhou (2010)	Hong Kong, China, Japan, The United States and The United Kingdom (1988-2008)	Panel regression	They reached the finding that development of stock market and economic growth was positively correlated.
Estrada et al. (2010)	116 Asian economies (1987-2008)	Panel regression	They found that development of financial sector affected economic growth positively.
Lartey (2010)	74 countries (1951-1995)	Dynamic panel model	She found that development of financial sector had a positive effect on economic growth.
Iyare and Moore (2011)	Barbados, Jamaica, Singapore and Trinidad and Tobago (1960-2003)	Johansen co-integration test, Granger causality test	They reached the finding that development of financial sector had a positive effect on economic growth.
Jalil and Feridun (2011)	Pakistan (1975-2008)	Autoregressive distributed lag (ARDL) bound testing approach	They reached the finding that development of financial sector had a positive effect on economic growth.
Nişancı et al. (2011)	D-8 countries (Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan and Turkey) (1974-2007)	Panel regression	They reached the finding that development of financial sector affected economic growth positively.
Anwar and Nguyen (2011)	Vietnam (1997-2006)	Panel data analysis	They found that there existed a positive relationship between economic growth and development of financial sector.

Study	Country/Country Group (Study Period)	Method	Main Findings
Zhang et al. (2012)	China (2001–2006)	Cross-sectional regression and dynamic panel data analysis	They reached the finding that development of financial sector had a positive effect on economic growth.
Al-Malkawi et al. (2012)	United Arab Emirates (1974-2008)	ARDL approach	They found that there existed a negative relationship between economic growth and development of financial sector and also bidirectional causality between economic growth and development of financial sector.
Kagochi et al. (2013)	Sub-Saharan Africa countries (1991-2007)	Panel Granger causality test	They found that that there was unidirectional causality from economic growth to development of banking sector and bidirectional causality between development of stock market and economic growth. On the other hand indicators related to the stock market had positive effect on economic growth, while indicators related to the development of banking had uncertain effect on economic growth.
Yıldırım et al. (2013)	Emerging European economies (Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Turkey, and Ukraine) (1990-2012)	Asymmetric causality test based on stationary Toda-Yomamoto approach	They found that there was unidirectional causality from economic growth to development of financial sector.
Adusei (2013)	Ghana (1971-2010)	Vector error correction, fully modified ordinary least squares, generalized method of moments	He found that development of financial sector had negative effect on economic growth in the short and long term.
Saqib (2013)	50 developing countries (2005-2009)	Multiple regression	He reached the finding that development of financial sector had a positive effect on economic growth.
Dudian and Popa (2013)	Central and eastern European countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania) (1996-2011)	Panel data analysis	They found that increments in the nonperforming loans and interest rate spreads and increments in the domestic credit to private sector affected economic growth negatively, while increments in growth rate of domestic credit to private sector affected economic growth positively.
Mercan and Göçer (2013)	BRIC-T countries (Brazil, Russia, India, China and Turkey) (1989-2010)	Panel data analysis	They reached the finding that development of financial sector affected economic growth positively.
Hakeem and Oluitan (2013)	24 Sub-Saharan countries	Panel co-integration test, impulse-response and sensitivity analyses	They found there existed unidirectional causality from real output to development of financial sector.
Ağayev (2013)	19 transition economies (1995-2010)	Panel data analysis	He found that development of financial sector affected the income level positively.

### 3. Data, Econometric Application and Findings

#### 3.1 Data

We examined the possible effects of development of financial sector on economic growth in emerging Asian countries by using panel regression. Our data cover 7 emerging Asian countries during the period 1992-2011 and the data was obtained from the Financial Development and Structure Database and the World Development Indicators (World Bank, 2013a & 2013b). We used the growth of GDP per capita as an economic growth indicator. We took deposit money bank assets to (deposit money + central) bank assets, liquid liabilities to GDP, private credit by deposit money banks and other financial institutions to GDP, money and quasi money (M2) as % of GDP, stock market capitalization to GDP, stock market total value traded to GDP (%), stock market turnover ratio and number of listed companies per 10K population as indicators of development of financial sector. The variables, their symbols and their sources were presented in Table 2. We used Eviews 7.1 and Stata 10.0 statistical packages in the econometric analysis.

Table 2. Variables used in the econometric analysis and their symbols

Variable	Symbol		Data Source
Real GDP per capita growth	RGDPCGR	Proxy for economic growth	World Development Indicators
Deposit money bank assets to (Deposit money + central) bank assets (%)	DBACBA	Proxy for importance of banks relative to the central bank	Financial Development and Structure Dataset
Liquid liabilities to GDP (%)	LLGDP	Proxy for overall size of financial system	Financial Development and Structure Dataset
Private credit by deposit money banks and other financial institutions to GDP (%)	PCRDGDP	Proxy for domestic asset distribution	Financial Development and Structure Dataset
Money and quasi money (M2) as % of GDP	M2	Proxy for financial development	World Development Indicators
Stock market capitalization to GDP (%)	STMKTCAP	Proxy for stock market size	Financial Development and Structure Dataset
Stock market total value traded to GDP (%)	STVALTRADED	Proxy for stock market liquidity	Financial Development and Structure Dataset
Stock market turnover ratio (%)	STTURNOVER	Proxy for stock market liquidity	Financial Development and Structure Dataset
Number of listed companies per 10K population	LISTCO_PC	Proxy for stock market development	Financial Development and Structure Dataset

#### 3.2 Econometric Application and Findings

The variables used in the panel data analysis should be stationary as in all the time series analyses to avoid causing possible spurious relationships among the variables. Therefore we tested common unit root process by Levin, Lin ve Chu (2002) test and tested unit root process for every unit (country) by Im, Pesaran ve Shin (2003). We tested stationarity in the series independent from units by Augmented Dickey Fuller (ADF) (1979) test. We found that all the variables were not stationary at level. So each variable was deseasonalized by Tramo/Seats and we took first difference of the variables to eliminate trend effect. We found that all the variables became I(1) after first differencing. The results of the panel unit root tests were given in Table 3.

Table 3. Results of panel unit root test

Method	DRGDPCGR (1)		DDBACBA (1)		DLLGDP (1)	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Levin, Lin & Chu t	-7.454	0.0000	-7.341	0.0000	-4.932	0.0001
Im, Pesaran and Shin W-stat	-5.223	0.039	-9.402	0.0021	-4.772	0.0203
ADF - Fisher Chi-square	22.005	0.0166	19.688	0.0000	23.066	0.0135
Method	DPCRDGDP (1)		DM2 (1)		DSTMKT CAP (1)	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Levin, Lin & Chu t	-6.007	0.0000	-10.638	0.0000	-9.022	0.0000
Im, Pesaran and Shin W-stat	-9.639	0.0000	-7.229	0.0022	-11.208	0.0355
ADF - Fisher Chi-square	18.442	0.0221	22.077	0.0000	25.284	0.0199
Method	DSTVALTRADED (1)		DSTTURNOVER (1)		DLISTCO_PC (1)	
	Statistic	Prob.	Statistic	Prob.	Statistic	Prob.
Levin, Lin & Chu t	-12.330	0.0025	-15.632	0.0000	-8.775	0.0000
Im, Pesaran and Shin W-stat	-8.5621	0.0066	-14.298	0.0032	-12.339	0.0177
ADF - Fisher Chi-square	17.553	0.0000	25.921	0.0287	18.630	0.0009

Panel data analysis is implemented by fixed and random effects as specified in Baltagi (2004). We applied some statistical tests to determine which estimation method we use in the analysis. The main issue is whether the data will be pooled among the countries and the periods because all the variables in the model may be varied among the countries and the periods. We used Chow test to determine common significance of country specific effects and time specific effects. Here effective estimator under null hypothesis is pooled ordinary least squares, while effective estimator under alternative hypothesis is fixed effect model (Berke, 2009:41). We used Chow and Breush- Pagan (BP) tests to determine which panel regression model would be used and the results of the tests were presented in Table 4. Null and alternative hypotheses for BP tests respectively pooled regression and random effects model, while null and alternative hypotheses for Chow test respectively are pooled regression and fixed effects model.

Table 4. Test results of panel regression estimation method

Test	p value	Decision
Chow (F test)	0.0133	Accept $H_1$
BP( $\chi^2$ test)	0.0204	Accept $H_1$

Later we used Hausman test to decide whether we use random effects model and fixed effects model. In this test null hypothesis is that there are random effects, while alternative hypothesis is that there are not random effects. The results of Hausman test were presented in Table 5. Hausman test results demonstrated that alternative hypothesis was accepted. So we used fixed effects model in the analysis.

Table 5. Hausman test results

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section and period fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.9412	(6,107)	0.0000
Cross-section Chi-square	51.564	6	0.0000
Period F	5.1048	(19,107)	0.0000
Period Chi-square	90.334	19	0.0000
Cross-Section/Period F	9.0763	(25,107)	0.0000
Cross-Section/Period Chi-square	159.328	25	0.0000

We used different algorithms for the analysis and the estimation results of the model obtained by panel-corrected standard errors (PCSE) algorithm which had minimum value of total squared error and the results of panel regression were presented in Table 6. We found that all the variables except DM2 and DLISTCO\_PC were statistically significant and had positive effect on economic growth. Moreover our explanatory variables explained 78.5% of variation in dependent variable (real GDP per capita growth). Our findings are consistent with the general trend in the literature. Financial sector development contributed to the rapid economic growth in emerging Asian countries during the 1990s and 2000s. 1% increase in DBACBA, LLGDP, PCRDGDP, STMKTCAP respectively caused 13.57%, 6.99%, 4.82%, 4.76%, increase in the economic growth.

Table 6. Results of panel regression estimation

Cross-section fixed effects test equation				
Dependent Variable: RGDPCGR				
Method: Panel Least Squares				
Sample: 1993 2011				
Total panel (balanced) observations: 133				
Period SUR (PCSE) standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DDBACBA	0.135731	0.037257	3.643127	0.0004
DLLGDP	0.069986	0.018247	3.835545	0.0002
DPCRDGDP	0.048259	0.017020	2.835361	0.0054
DM2	0.009578	0.012755	0.750941	0.4542
DSTMKTCAP	0.047645	0.016899	2.819460	0.0056
DSTVALTRADED	0.000954	0.000348	2.744211	0.0071
DSTTURNOVER	0.018133	0.007063	2.567548	0.0115
DLISTCO_PC	0.012507	0.012680	0.986374	0.3258
C	10.56610	4.120481	2.564287	0.0115
Effects Specification				
Period fixed (dummy variables)				
R-squared	0.785988	Mean dependent var		4.405214
Adjusted R-squared	0.763737	S.D. dependent var		4.125350
S.E. of regression	2.563907	Akaike info criterion		4.892401
Sum squared resid	742.8190	Schwarz criterion		5.459718
Log likelihood	-315.4681	Hannan-Quinn criter.		5.122942
F-statistic	39.49461	Durbin-Watson stat		1.930788
Prob(F-statistic)	0.000000			

Autocorrelation is an important problem in the panel data analyses as in all the time series. One of the main assumptions of the regression analysis is that there should be not the relationship (correlation) among the same error terms for the different observations. If the error terms are interrelated, this is called as autocorrelation or serial correlation (Greene, 2011). We tested the autocorrelation in the data set by Woolridge (2002) autocorrelation test. The test result was presented in Table 7 and the null hypothesis, which states that there is no autocorrelation, was rejected according to the test results. In other words there was no autocorrelation among the error terms.

Table 7. Results of Woolridge autocorrelation test

F value	Probability
142.667	0.184

On the other hand heteroscedasticity was tested by Greene heteroscedastic test and the test result was presented in Table 8.  $H_0$  hypothesis, which states that there is no heteroscedasticity, was accepted according to the test results.

Table 8. Results of Greene heteroscedastic test

chi2 (2) = 255.781
Prob>chi2 = 0.183

#### 4. Conclusion

The process of financial globalization accelerated especially during 1990s and 2000s. The financial sectors of emerging Asian countries developed significantly during the process of financial globalization and they experienced significant economic growth rates and converged towards developed countries, although they were hit by Asian financial crisis in 1997 and 2008 global financial crisis. We investigated the possible effects of development of financial sector on economic growth in emerging Asian countries during the period 1992-2011 by using panel regression analysis.

We found that all the variables which represent financial sector except money and quasi money (M2) and number of listed companies per 10K had positive impact on economic growth and they explained 78.5% of variation in economic growth. Our finding are consistent with main trend in the theoretical and empirical literature and results of the studies such as Mercan and Göçer (2013), Zhang et al. (2012), Nişancı et al. (2011), Estrada et al. (2010) which included emerging Asian economies. Empirical findings suggested financial sector development is an important element of economic growth. Therefore the rest of the Asian countries also should focus on strengthening and improving their overall financial sector in order to implement and sustain economic growth.

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