FINANCIAL DEVELOPMENT, FINANCIAL OPENNESS AND GROWTH: AN EMPIRICAL INVESTIGATION

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

BURÇİN AKGÜN ÜNALDI

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF ECONOMICS

NOVEMBER 2011

Approval of the Graduate School of Social Sciences

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ABSTRACT

FINANCIAL DEVELOPMENT, FINANCIAL OPENNESS AND GROWTH:

AN EMPIRICAL INVESTIGATION

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November 2011, 170 pages

The economic literature posits that a well-functioning economy requires a well-regulated financial system, and a sound financial system is essential to the fundamentals of an economy, however, even the most influential economists disagree sharply about the role of the finance-growth relationship in economic development. One of the most important questions concerning financial openness is whether it spurs long-run economic growth, and if yes, do these benefits outweigh the risks for developing countries. In addition, the conventional economic theory often postulates that a more developed financial sector provides a productive ground for higher economic growth. Is financial development a major prerequisite for economic growth? Additionally, institutional quality has also received a considerable attention since it is thought of a significant channel in the finance-growth relationship.

This thesis aims to investigate the links between financial integration, financial development, and growth, taking institutional quality and the level of the development of the economy into consideration. To this end, a large panel data set is used and panel data estimation techniques are employed. The results show that emerging economies benefit the most from financial openness regardless of any preconditions. On the other hand, developing economies should be cautious since financial openness may hinder growth unless institutional development is healed

before financial openness policies take speed. Moreover, the results indicate that, financial development fosters growth and the level of institutional development is an important determinant of the finance-growth relationship in the overall.

Keywords: Financial Openness, Financial Development, Institutional Development, Growth

ÖZ

FINANCIAL GELİŞMİŞLİK, FİNANSAL AÇIKLIK VE BÜYÜME:

AMPİRİK BİR İNCELEME

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Tez Yöneticisi: Prof. Dr. Erdal ÖZMEN

Kasım 2011, 170 sayfa

Ekonomi literatürü iyi çalışan bir ekonominin doğru düzenlenmiş bir finansal yapıyı gerektirdiğini öne sürer. Sağlam bir finansal sistem, ekonomi temellerinin esaslarından biridir, ancak halen, en etkili ekonomistler bile ekonomik kalkınmada finans-büyüme ilişkisinin rolü üzerine ihtilafa düşmektedir. Uluslararası finansal entegrasyonun en önemli sorularından biri bu durumun uzun dönem ekonomik büyümeyi etkileyip etkilemediğidir, ve eğer etkiliyorsa getirdiği fayda özellikle gelişmekte olan ülkelerde yarattığı risklerden daha ağır basmakta mıdır? Bunun yanında, yaygın iktisat teorisine göre finansal sektörün gelişmesi, kaynakların üretken tahsisini, daha az bilgi asimetrisi ve daha etkin kontrolü sağlayarak daha yüksek ve istikrarlı bir ekonomik büyümeye yol açmaktadır. Finansal gelişmişlik, ekonomik büyümenin öncü koşullarından biri olabilir mi? Yanısıra, finans-büyüme ilişkisi için önemli kanallardan biri olduğu düşünülen kurumsal gelişmişlik de son dönemlerde önemli ölçüde ele alınmıştır.

Bu tezde finansal açıklık, finansal gelişme ve ekonomik büyüme arasındaki ilişkilerin incelenmesi amaçlanmaktadır. Özellikle, finansal açıklıktan büyüme faydası sağlayabilmek için kurumsal gelişmişlik ve kalkınmanın derecesi faktörleri de dikkate alınmıştır. Bu amaçla gelişmiş ve gelişmekte olan ülkelerden oluşan geniş bir panel veri seti kullanılmış ve panel veri ekonometrisindeki son dönem teknikler uygulanmıştır. Sonuçlar göstermektedir ki, herhangi önkoşul ya da şart

aranmaksızın, finansal açıklıktan en çok faydayı yükselen piyasa ekonomileri sağlamaktadır. Diğer taraftan, gelişmekte olan ülkeler dikkatli olmalıdır, zira finansal olarak açılma politikaları hız kazanmadan önce kurumsal gelişmişlik düzeyi iyileştirilmezse finansal entegrasyon uzun dönemde büyümeye sekte vurmaktadır. Bunlara ek olarak, sonuçlar finansal gelişmişliğin büyümeyi olumlu etkilediğini ve kurumsal gelişmişliğin finans-büyüme ilişkisinde önemli bir etmen olduğunu söylemektedir.

Anahtar Kelimeler: Finansal Açıklık, Finansal Gelişmişlik, Kurumsal Gelişmişlik, Büyüme

To

My Beloved Mother

and

My Prince Charming

ACKNOWLEDGEMENTS

First and foremost I want to thank my advisor Prof. Dr. Erdal Özmen for his guidance, advice, criticism,insight, understanding and motivations throughout the research. It has been an honor to be his Ph.D. student. He is more than a supervisor but also a mentor. The joy and enthusiasm he has for a research was inspiring and motivational for me, even during harsh times throughout the study.

I am also grateful to Assoc. Prof. Dr. Barış Sürücü for his suggestions and encouragement. This thesis would not have been possible unless he made me look from a different angle on the matter from time to time. I would like to thank Assoc. Prof. Dr. Sevtap Selçuk-Kestel and Assoc. Prof. Dr. İnci Batmaz for their friendly support and guidance; and my colleague Dr. Çağaçan Değer for his technical assistance and contributions. For this dissertation I would like to thank all members of my defense committee for their time and insightful questions.

It is a pleasure to thank those who made this thesis possible: my family and friends. My time in between Ankara and Istanbul was exhausting but at METU it has always been enjoyable with my loving friends. My grateful thanks goes to dear Könül Bayramova, Deniz Akınç, Ilgın Cangir, Ezgi and Öke özkılıç, Barış, and Neşe Bayram. No words can explain how grateful I am. Special thanks goes to my dearest friend Fatma Pınar Erdem who shares all the burden of my study next to hers from the first minute we started Ph.D together to the last. I am also grateful to one of my best friends Ahmetcan Öztürk, the last gentleman standing, who always solves things for me, who always listens and cares. This circle of friends has not only been source of fun but also good advice and collaboration.

I owe my deepest gratitude to my mother, my father and my spouse who all sacrifice and wait in patience for years. My loving, supportive, and encouraging husband Ali Burak ÜNALDI has made his support available in many ways. I can not ever thank him enough that he never gave upon me, never stops believing and never left me alone. Once in two weeks he farewells and welcomes a wife and

never gets tired of it, or at least never made me feel so. My mother and father always lived their life suited to me and my studies, and supported me in all my pursuits. This study is just a dream coming true for my parents, Ruhsar and Osman Akgün, who have effort in every word and space in this thesis. Especially my mother took all the agony and replace it with peace each and every time. I love you mum and I am sorry that an angel like you has to spent years with an irritable daughter like me. And my beloved sisters, Gülçin Akgün and Büşra Ünaldı, thank you for your cheerful motivations, and for always being there for me. I also would like to thank to my extended family, Cumali, Zühal and Atıf Ünaldı for their understanding and support; especially Zuhal Ünaldı, for her heartful inspirations and suggestions.

Lastly, I gratefully acknowledge the funding source TUBITAK-BIDEB that made my Ph.D. work possible. Thank You.

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CHAPTER 1
INTRODUCTION

The economic literature posits that, in a world of increased capital flows, a well-functioning economy requires a well-regulated financial system which efficiently channels savings into investment. A financial system is composed of banking institutions, financial markets, securities markets, pension funds, insurers, other financial intermediaries and regulatory institutions which supervise these intermediaries. The financial system has a vital role in mobilizing and efficiently allocating savings and resources to productive sectors and meeting the different requirements of borrowers and lenders. Thus, a sound financial system is essential for supporting economic growth and must be integrated to the development policies.

Joseph Schumpeter argued back in 1911 that "*financial intermediaries play a pivotal role in economic development because they choose which firms get to use society's savings*" (Schumpeter, 1934; cited by Beck *et al.*, 1999). A sound financial system is essential to the fundamentals of an economy, and development policies must not oversight financial improvements, however, even the most influential economists disagree sharply about the role of the finance-growth relationship. Although, it is widely agreed that there are important relationships between finance and development, there is still no consensus on the exact nature of these relationships. Is financial development a major prerequisite for economic growth, or is it no more than a passive side product of the development itself? On one hand in a collection of essays by the "pioneers of development economics" including three Nobel winners, finance is not even mentioned (Meier and Seers, 1984). For instance, Lucas (1988) states that the role of finance is too "overemphasized" and dismisses it as a major determinant of growth. Further, as noted by Levine (2003), Stern's (1989) review of development economics does not discuss financial system even in omitted topics list.

These economists claim that finance does not cause growth but automatically responds changing demands from the real sector. On the other extreme, as reviewed by Levine (2003), another Nobel prize winner Merton Miller (1988) states that financial markets' contribution to economic growth is an obvious proposition to be studied of. Similarly, Bagehot (1873), Schumpeter (1911), Gurley and Shaw (1955), Goldsmith (1969), and McKinnon (1973) are all stand aside the idea that the finance-growth nexus can not be ignored without substantially understanding economic growth (cited by Levine, 2003).

Broadly speaking, there are four major views for the finance-growth nexus. The first one is the supply-leading view, which supports a positive impact of financial development on economic growth. The demand-following view depends on Robinson's (1952) statement that "*where enterprise leads, finance follows*" implying that finance actually responds to changes in real-sector. In the middle of these two views is the one that calls a mutual impact of finance and growth. Finally, some literature argues that there is no relationship at all (Apergis, Filippidis, Economidou, 2007)[1].

How, in theory, could finance contribute to the growth process? Although economists attach different degrees of importance to financial development, its contribution to long-run growth is theoretically presumed: financial sector development not only enhances growth but also diminishes the fragility when faced to a crisis. Caballero and Krishnamurthy (2001); Aghion, Bacchetta, and Banerjee (2004); Mendoza, Quadrini, and Rios-Rull (2007); Aoki, Benigno, and Kiyotaki (2007) showed in different theoretical settings that, without financial development, interaction of domestic and international collateral constraints can yield unpredictable and adverse effects of financial openness, too (Köse, 2009).

The first generation of neoclassical growth models attributed economic growth to exogenous technical changes and population growth (Solow, 1956, 1957), yet recent literature emphasize the key role of finance in achieving economic growth in developing countries (Levine and Demirgüç-Kunt 2001; Evans *et al*., 2002). Endogenous growth theory suggests that an effective

[1] These alternative approaches and the related literature are discussed in Chapter 2.

financial system can foster economic growth through various channels since it helps overcome market frictions occurred by several reasons such as information asymmetries and transaction costs. Furthermore, there are two other major and complementary channels through which financial development can influence growth: the capital accumulation channel and the total factor productivity (TFP) channel. The capital accumulation channel, often known as the quantitative channel, focuses on the financial sector's ability to overcome indivisibilities through savings mobilization. The TFP channel, often known as the qualitative channel, stresses the role of financial innovation in reducing asymmetric information (Townsend, 1979; Greenwood and Jovanovic, 1990; King and Levine, 1993b; Ang, 2008). Financial development also has a direct impact on macroeconomic stability. The lack of a healthy financial system worsen the boom-bust cycles in developing economies facing sudden changes in the direction of capital (Caballero and Krishnamurthy, 2001; Aghion and Banerjee, 2005) and contribute to crises associated with financial integration (Mishkin, 2006).

As Levine (2003) summarized, financial development involves improvements in the (i) production of *ex ante* information about enterprises and possible investments, and effective allocation of capital (ii) monitoring of investments and exerting corporate governance, (iii) trading, diversification, and management of intertemporal risk, (iv) mobilization and pooling of savings, and (v) easing the exchange of goods and services[2].

Without financial markets and institutions, savers prefer to restrain their savings rather than investing on long-term risky projects provided by a wide number of enterprises, because it would be costly and uneasy to evaluate such projects in terms of risks and benefits. Financial systems minimize the costs of information on investments, and monitor and evaluate their performance[3].A well-developed financial system leads to more efficient allocation of resources. Many models assume that capital flows toward the most profitable firms presupposing that investors have good information about market

[2] These are the five major functions of a financial system in particular. Although all financial systems provide these financial functions, the degree of their functioning differs largely.

[3] See Diamond, D.W. (1984) for a theory of financial intermediation on minimizing the cost of monitoring information to resolve incentive problems between the borrowers and lenders.

conditions (Bagehot, 1873; cited by Ang, 2009). However, in reality, individual savers may not have the ability to collect, process, and produce information on possible investments so that high information costs may keep capital from flowing to its highest value use. In a capital scarce environment, financial intermediaries that produce better information will fund more promising firms and induce a more efficient allocation of capital (Greenwood and Jovanovic, 1990). Consequently, the improved quality of investments can accelerate economic growth. Besides identifying the best investment opportunities, financial intermediaries may also boost the rate of technological innovation by identifying those entrepreneurs with the best chances of successfully initiating new goods and production processes (King and Levine, 1993b).

Another role of financial system is to reduce the cost of monitoring investment projects. Standard agency theory defines the corporate governance problem in terms of how equity and debt holders influence managers to act in the best interests of the providers of capital (Levine, 2005). In the absence of financial arrangements corporate governance may hinder the mobilization of savings from distinct agents and thereby prevent capital flowing to profitable investments or managers can use their control rights to pursue projects that benefit themselves rather than the firm (Levine, 2005) and therefore hurt an effective resource allocation. These financial contracts ensure that the flow of mobilized savings or capital to profitable investments is not hindered. The literature on how financial markets and institutions may improve corporate governance, influence capital accumulation, resource allocation and long-run growth is reviewed insightfully by Shleifer and Vichny (1997).

Efficient financial systems allow investors to diversify their portfolios and hedge against risks. Levine (2004) takes the discussion in three categories: cross-sectional risk diversification, intertemporal risk sharing, and liquidity risk. The financial systems provide vehicles for trading, pooling, and diversifying risk, hence these services can affect long-run economic growth by altering resource allocation and the savings rate. Acemoglu and Zilibotti (1997) noted that high-return, risky projects are generally indivisible and

require a large initial investment; people dislike risk; safe-projects are more lower-return; and capital is scarce. As a result, financial systems enabling agents to hold a diversified portfolio of risky projects will allow society to invest more in high-return projects with positive implications for growth. Theory has tended to focus on the role of financial markets rather than intermediaries while examining the relation between cross-sectional risk sharing and growth.

The relationship between savings mobilization and financial development has received relatively less attention. A common problem in developing countries with poorly developed financial sectors is the mismatch between savings and investment, in other words lack of investment in productive capital. As financial systems expand and intermediaries establish stellar reputations, more funds will be available for investments. Thus, financial systems that are more effective at pooling the savings of individuals can profoundly affect economic development.

Business transactions are facilitated through credit offerings and payment guarantees. The links between exchange, specialization - division of labor -, and innovation were the core elements Adam Smith's Wealth Of Nations (1776; cited by Levine, 2005). He argued that specialization is the principal factor underlying productivity improvements. More specialization requires more transactions and since each transaction is costly, financial arrangements that lower transaction costs will promote specialization, technological innovation and hence, growth.

Economists have discussed over the past century whether or not financial development has a causal impact on economic development. Goldsmith (1969) was the first to empirically documented the positive correlation between financial development and GDP per capita. The conventional economic theory often postulates that a more developed financial sector provides a productive ground for the allocation of resources, better monitoring, fewer information asymmetries and thus higher economic growth and lower economic volatility. Many studies showed that international financial integration creates collateral benefits (Köse, Prasad, Rogoff, Wei, 2006)

such as financial development which could enhance growth especially in total factor productivity (Prasad, Rajan, 2008; Stulz, 2005). And that many others claim that satisfying a certain level of financial development is a prerequisite for deriving growth benefits from financial openness.

One of the most important questions concerning financial openness is whether it spurs long-run economic growth, and if yes, do these benefits outweigh the associated risks. The World Bank, International Money Fund, and the World Trade Organization believe that the answer is positive (Levine, 2001). In the mid-1990's mainstream economists of nearly all schools commonly recommended capital account liberalization - that is, allowing a free flow of funds in and out of a country's economy - as an essential step in the economic development. Indeed, in September 1997, the governing body of the International Money Fund (1997) sought to make "*the liberalization of capital movements one of the purposes of IMF, and extend as needed, the IMF's jurisdiction,…regarding the liberalization of such movements*." (Prasad, and Rajan 2008). On the contrary, Paul Krugman (1993) concludes that it is not. He argues that conventional analysis of growth puts relatively little weight on capital in general, and thus offers little reason to suppose that capital flows will do much to promote economic convergence unless they are extremely large. Similarly Rodrik (1999) warned that financial openness can be incredibly costly without appropriate controls, regulations and macroeconomic policies. After the Asian debacle of 1997-98, prominent critics of financial globalization argued that its benefits are intangible and undocumented where its risks are enormous and real. Obstfeld (2008) claims that especially developing countries should increase their financial openness moderately and cautiously considering the weak and still inconclusive direct evidence on growth.

Additionally, institutional quality has also receive a considerable attention since it is thought of a significant channel in the financial openness and growth relationship. The rule of law, the voice and accountability, the legal environment, the level of corruption and similar qualitative indicators[4] can effect the allocation

[4] Based on a long-standing research program of the World Bank, the Worldwide Governance Indicators (WGI) constitute one of the largest and well-known compilations of cross-country data on

and monitoring of capital in an economy, hence it matters in terms of fragility for financially open countries. A range of empirical studies supports that countries with high quality institutions interacting with financial openness gain growth benefits, while some argue that there is not sufficient evidence to derive policy implications covering the degree of institutional quality. A number of studies on the other hand, investigated nonlinear threshold levels for institutional quality in which countries need to attain in order to derive growth benefits. The view that better institutions lead to greater financial development and higher economic growth is much concerned by Adam Smith in The Wealth of Nations (cited by Osili and Paulson, 2004). A number of empirical studies considering various aspects of institutional quality such as legal origin, common law, corporate governance, investor rights and more support this view (La Porta *et al.*, 2000; Levine, 1998; Levine, Loayza and Beck, 2000; Rajan and Zingales, 2003; Beck, Demirgüç-Kunt and Levine, 2003a and 2003b; Acemoglu,Johnson and Robinson, 2001).

Many studies and researches in theoretical and emprical area are performed in order to figure out the possible benefits and costs of financial openness on growth and many investigated if financial development and institutional development matters for growth. Yet, still, none agree upon a single conclusion, especially due to the fact that each of these determinants have severe measurement problems.

The main goal of this paper is to make an empirical contribution to the ongoing debate on finance and growth relationship in several aspects. We aim to investigate the direct and indirect effects of financial openness and financial development on economic growth and applied a variety of econometric procedures to identify them. To this end we consider conventional determinants of growth such as trade openness measured as the sum of real exports and imports divided by GDP, ratio of the secondary school attainment in the population to control for human capital, the inflation rate as average annual changes in the consumer price index, the ratio of government expenditures to GDP, and the logarithm of initial real income as control variables next to indicators of financial openness and financial development as interest variables.

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governance. WGI captures six key dimensions of governance (Voice & Accountability, Political Stability and Lack of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption) between 1996 and present. See Kaufman *et al.* (2008) for further detail.

Firstly, unlike the conventional growth regressions used in the literature so far, the level of real per capita GDP is chosen as the dependent variable rather than the first difference due to econometric appropriateness. Secondly, the role of financial openness and financial development is analyzed not only for overall sample but also with respect to the level of the development of the economy. The effects of each determinant is tried to be determined and compared among industrial and developing countries. This study also contributes to the institutional quality and growth literature by embracing a broader variable using the PolityIV data set (Marshall *et al.*, 2010) in order to identify whether the sign and magnitude of financial openness and development on growth change as countries' level of institutional development changes.

This study is organized as follows. Chapter 2 reviews the literature in three major parts: the theoretical development and evidence on financial development and growth relationship; the theory and empirical evidence about the role of financial openness on economic growth; and the theoretical and empirical studies on the collateral growth effects of institutional quality. The review on finance and growth is divided into separate sections each revisiting the cross-sectional, the time series and the panel econometric techniques applied throughout the literature. Chapter 3 presents the basic stylized facts depicting the finance-growth nexus through descriptive statistics, measurement issues and figures displaying the direct effects between financial openness, financial development and growth. Chapter 4 is devoted to the empirical analyses in the study which aims to identify if finance spurs economic growth. The very first section of the chapter covers panel data estimation with fixed effects (FE) with respect to a predetermined threshold level for institutional development. Though, panel fixed effects estimation carries some shortcomings, it enables us to compare our results with the previous literature. The second section make use of panel error correction modelling (ECM) approach in order to figure out the short-run dynamics of the finance-growth nexus as well as the long-run relationship among the variables of interest from a general panel autoregressive distributed-lag (ARDL) model. Panel ARDL model is preferred since it enables estimation to be valid whether or not the variables in the model are I(0) or I(1) or mutually cointegrated. Another advantage of panel ARDL method is that estimation is possible even when explanatory variables are endogenous. Based

on panel ARDL methodology, the short- and long-run effects of financial openness and financial development are estimated both accordingly to the level of development of the economy and level of income. The final section of Chapter 4 hosts the dynamic Generalized Method of Moments (GMM) approach to long-run modeling the finance-growth relationship in order to deal with the potential problems caused by simultaneity and the inclusion of lagged dependent variable. The study concludes with the final chapter summarizing the findings.

CHAPTER 2
REVIEW OF LITERATURE

In reviewing the literature on the importance of financial systems for economic growth, this study focuses mainly on financial development and financial openness since a diverse empirical literature shows that benefiting from financial openness also requires a level of financial development. Additionally, the notion of institutional quality has taken its place with the late attention on its collateral effects on financial growth through financial openness. Rest of the section reviews both theoretical and empirical literature between financial development, financial integration and economic growth.

2.1. The Development of the Finance-Growth Nexus: Theory

As already mentioned, economists own different views about the relationship between financial development and growth. The link between financial development and growth was first demonstrated by Bagehot in 1873 (Levine, 2003) who speaks that industrialization of England was possible due to the use of financial system mobilizing financial capital for production. Initially, in 1911 Schumpeter argued that financial intermediaries are essential for technological innovation and thus economic development. An alternative argument developed in 1952 by Robinson (Levine, 2003) suggests that financial development does not yield a higher economic growth but it responds passively to the higher demand for financial services as economy grows. When an economy expands, agents demand more financial services, and in response to this increased demand, more financial products emerge which leads a development in the financial system.

Similar to Schumpeterian view, Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969) discuss that financial development is crucial for stimulating economic growth (Levine, 2003). Their view suggest to develop

policies aiming to expand financial systems in order to spur economic growth. This "financial structuralist" view is an opposite to the "financial repressionist" view which refers to interest rate controls, high reserve requirements and directed credit programmes (Ang, 2008).

In 1970s, McKinnon (1973) and Shaw (1973) challenged against the Keynesian view on the role of financial markets in the growth process, suggesting that higher financial development which can result from international financial integration will lead to increased output growth so that both call for "financial liberalization" view. The McKinnon model assumes that investment in a developing economy is mostly self-financed and due to its lumpy nature, investment can not materialize unless sufficient saving is piled in the form of bank deposits. On the other hand, Shaw (1973) presented the "debt-intermediation" view which postulates that financial intermediaries promote investment and increase output growth through borrowing and lending. The McKinnon model was further studied by many researchers such as Kapur (1976), Mathieson (1980), Fry (1988) and Pagano(1993).

Coming to the early 1980s, as reviewed by Ang (2008), the McKinnon-Shaw framework was criticized by neo-structuralist economists such as Wijnbergen (1982, 1983), Taylor (1983) and Buffie (1984). The main focus in their models were on "curb markets" assuming that households own three types of assets: bank deposits, gold, and curb market loans which are substitutes for each other. As bank deposit rates rises, households substitute curb market loans instead, which will decrease the loanable funds supply discouraging investment and suppressing output. In other words, neo-structuralists claim that in the existence of efficient curb markets, financial liberalization is likely to reduce economic growth by lowering credit supply which is later found unrealistic with the findings of Fry (1988), Owen and Solis-Fallas (1989).

As growth literature evolved, more complicated models integrating financial systems into endogenous growth models arised in the early 1990s. Greenwood and Jovanovic (1990), Bencivenga and Smith (1991, 1993), Saint-Paul (1992), King and Levine (1993b), Pagano (1993), Bencivenga *et al*. (1995)

Greenwood and Smith (1997), Blackburn and Humg (1998) presented studies employing various techniques to model financial intermediation explicitly instead of taking it for granted as in the McKinnon-Shaw approach.

The endogenous financial development and growth models show bilateral interactions between these two variables. That is, a higher level of economic development increases the demand for financial services leading to a more competitive and efficient financial system. On the other hand, increased financial development allows investments to be launched more efficiently enhancing capital accumulation and growth.

Not all economists accept a positive and/or significant relationship between finance and growth. Some claim that finance is totally irrelevant in growth process, some point out to the negative influence of banks, destabilizing effects of stock markets, and financial crises. And many prominent economists are opposing to incautious financial liberalization.

In their cornerstone study of modern corporate finance, Modigliani and Miller (1958) put an irrelevance proposition in which real economic decisions are independent of the financial structure. Their model assumes a world of perfect markets with no information asymmetry and no transaction costs in any economic activity. Within this frame, Fama (1980) displays that in a competitive banking sector with equal access to capital markets, a change in lending decision by any individual bank will have no effect on price and real activity under a general equilibrium setting (Ang, 2008). Lucas (1988) argues that economists overstresses the role of financial factors in the process of economic growth. Morck and Nakamura (1999) and Morck *et al.* (2000) demonstrate, in principal, banking sector development can have a negative effect on economic growth. Similarly, the relation between stock markets and economic growth is under debate. Keynes (1936) claims that due to their unstable and speculative nature, stock markets have destabilizing effects on an economy (Ang, 2008). In addition, Kindleberger (1978) and Singh (1997) contend that expansion of the stock market in developing economies is likely to hinder long-term growth since irrational speculations cause asset price balloons which will explode and bring

economic crises in the presence of a weak banking system. Minsky (1975) indicates how financial crises caused from instable financial systems can have severe negative effects on the economy (Levine, 2003). Again Minsky (1991) presented his "financial instability hypothesis" that rapid economic development encourages more risky behaviours and brings economy to a boom phase loaded with speculative activities followed by recession when bankruptcies kick in.

2.2. Financial Development and Growth: Evidence

Whether financial development has a causal impact on economic development or not is like the age-old dilemma of a chicken and egg story, the question whether financial development causes or is caused by growth is one major ambiguity in the finance-growth literature. While the theory was developed mostly in 1950s, empirical counterparts have strikingly been evolved through 1990s following the pioneer study of King and Levine (1993a). Using data for various countries and time periods, most of these empirical studies document a positive association between financial development and economic growth. Yet this does not mean that financial development is always exogenous to economic growth (Levine, 1997) or the relationship is always strong or robust (Köse, Prasad and Terrones, 2003). Moreover, the empirical results do not have certain influence on the policy decisions due to the ambiguous conclusions.

This section of the review is categorized based on the econometric methods used to examine finance and growth relationship. The first sub-section covers cross- country evidence on finance and growth. The second sub-section presents pure time series studies and country based investigations. The third sub-section reviews panel studies on the nexus. And the last section covers the micro-level studies.

2.2.1. Cross-Country Studies on Finance and Growth

Goldsmith (1969) was first to empirically documented the positive correlation between financial development and GDP per capita. His study

investigates whether finance has a casual effect on economic growth using an annual data set of 35 countries over the period 1949-63 and emphasizes the connection between a country's financial superstructure and its real economic infrastructure (Green, Kirkpatrick, Murinde, 2005). Using Ordinary Least Squares (OLS) techniques and graphical analysis, Goldsmith documented a positive correlation between financial development and the level of economic activity and argued that financial markets facilitate growth by enabling efficient intertemporal resource allocation. Although the regression results showed a clear positive relationship, it was statistically weak since correlation coefficients are low and in fact negative for developed countries. Despite his findings, Goldsmith did not take a stand on whether financial development causes growth. He pointed out the problems in the study himself such as taking a small sample of countries into consideration, systematically not controlling for other factors that may influence economic growth, not examining whether financial development is associated with productivity growth and capital accumulation as theory stresses, the indicator used for financial development may not be an accurate proxy, and the direction of the causality is unidentified.

Focus on using banking variables to proxy financial development brings newer studies examining the role of stock markets in promoting economic growth. For instance, Atje and Jovanovic (1969) applied OLS techniques on annual observations for 94 countries through 1960-85. Their findings suggest that stock markets have positive growth effects on the economy, yet again with some shortcomings.

Empirical studies on finance-growth nexus improved in 1990s following the seminal work of King and Levine (1993a). Authors covered 80 countries over the period 1960-89 controlling for other factors that affect long-run growth. King and Levine (1993a) constructed additional measures of the level of financial development next to the ratio of liquid liabilities over GDP such as bank credit over bank credit plus central bank assets, credit to nonfinancal private enterprises over GDP, credit issued to nonfinancial private firms divided by total credit (excluding credit to banks). Their regressions showed that the level of financial depth is a good predictor for long-run growth once controlling for income,

education, and measures of monetary, trade, and fiscal policies. The relationship between the initial level of financial development and growth is economically significant (Levine, 2003). Authors examined the capital accumulation and productivity growth channels, and analyzed whether the level of financial development predicts long-run economic growth, capital accumulation, and productivity growth. They found strong positive relationship between financial development and growth, and the results were consistent for various financial development measures and growth indicators.

Besides the focus on banking, the link between stock and equity markets and long-run economic growth is studied by Levine and Zervos (1998a). They constructed numerous measures of stock market development such as the turnover ratio, which is a liquidity indicator, to assess the relationship between stock market development and economic growth[5]. This turnover ratio which displays large cross-country variability is equal to the total value of shares traded on a country's stock exchanges divided by stock market capitalization and it measures trading relative to the size of the market. It therefore reflects trading frictions and information that induces transactions. Levine and Zervos (1998a) found that the initial level of stock market liquidity and the initial level of banking development are positively and significantly correlated with future rates of economic growth.

As an alternative measure of financial development, La Porta *et al*. (2001) used the degree of government ownership of banks around the world which provides direct evidence about the link between economic growth and the financial intermediaries. Their study showed that higher levels of public ownership are associated with financial underdevelopment and slower economic growth.

While these studies agreed that financial development predicts economic growth, neither of them considered the issue of causality that finance may be a leading indicator rather than a fundamental cause. To investigate whether the finance-growth nexus is driven by simultaneity bias, instrumental variables (IV) methodology is required. In 1998, La Porta *et al*. used "legal origin" of countries which depicts whether a country's - commercial/company law is originated from

[5] These measures build on Demirgüç-Kunt and Levine (1996a,b).

British, French, German, or Scandinavian law. Later, Levine, Loayza, and Beck (2000) studied 71 countries with data averaged over 1960-95, such that there is one observation per country, using the legal origin indicators as instrumental variables in a generalized method of moments (GMM) regression with a new financial development measure, Private Credit, which equals to the ratio of credits by financial intermediaries to the private sector over GDP. Their results showed that there is a strong relationship between financial intermediary development and long-run economic growth. Moreover, the data suggested that the instruments are appropriate so that the strong link between financial development and growth is not due to simultaneity bias.

On the contrary, Ram (1999) performed OLS using averaged annual data for 95 countries over the period 1960-89 and showed that the correlation between financial development and economic growth is weakly negative or negligible. Similar results are obtained when the analyses are performed on each individual country, and on each sample grouped by the level of growth rates (Ang, 2009).

Hermes and Lensink (2003) used 67 developing countries over the period 1970–1995. Authors chose gross FDI inflows to GDP as the openness measure and linearly interact it with private bank credit to GDP variable in order to explain real per capita GDP growth. Their results showed that in order to gain growth benefits from FDI, a certain level of financial development is a prerequisite. Alfaro *et al.* (2004) performed a cross-section study including instrumental variables approach using both banking and stock market variables through 1975 to 1995. They used the ratio of net FDI inflows to GDP and found a positive significant coefficient on interaction of FDI with various financial development measures such as the ratio of liquid liabilities over GDP, the ratio of private credit to GDP etc. Their results were robust to additional controls and IV estimation.

Summarizing, the main findings of pure cross-country analyses often suggest that financial development has positive impact on economic growth. Although these empirical studies have made notable progress in finance-growth nexus, they are also subject to several limitations and criticisms due

to the standards of the econometric techniques employed. Pure cross-country regressions construct observations for each country by averaging out the variables over the entire period of the study typical to Barro's (1991) regression model, yet there are several econometric problems associated with this specification. First of all, most studies seek an answer to how the financial system affects growth, while little try to investigate the reverse and since endogeneity has not been properly controlled for, they likely to yield biased and inconsistent estimators (Ang, 2009). As we reviewed above, some researchers employ IV estimation techniques to deal with endogeneity bias yet this technique is insufficient with averaged data (Ahmed, 1998; Ericsson *et al*. 2001). The averaging of data over long horizons may also eliminate the dynamics of the system yielding to spurious contemporaneous correlation even though the original series are not contemporaneously correlated. A more reliable approach may be to perform simultaneous equations which explicitly identifies a model for the financial development.

Another weakness was mentioned by Thiel (2001) emphasizing the importance of having long time series for analysis of the finance-growth link. Economic growth is a long-term phenomenon which required sufficiently long time series for the analysis of the finance-growth link and since financial development measures may not necessarily be associated with growth on a short-term basis, the period must be chosen carefully.

Moreover, in an early study by Gupta (1970), the risks of grouping countries together was explained fully. Using the same source of data, Gupta (1970) replicated the study of Rahman (1968) using 50 countries instead of just 31 and the results show that the coefficients change sign and significance. Harris (1997) showed that the results of Atje and Jovanovic (1993) are not robust, moreover he found only a weak impact from stock market activity on growth in per capita output as is opposite to the findings of Atje and Jovanovic (1993) over the period 1980-1988 for 40 countries.

Furthermore, Rioja and Valev (2004) divided sample countries of Levine and Zervos (1998) into several groups according to their level of financial development and obtained a different result on the relationship between financial

development and economic growth. Garretson *et al*. (2004) also showed that the positive link between the stock markets and economic growth found by Levine and Zervos (1998) disappears once legal and societal factors have been controlled for.

To sum up, all of these findings warns about the results obtained from cross-country studies that they are ambiguous, inconclusive and fragile. They suddenly change as the sample countries, the control variables, the time period and the econometric techniques change.

Without high quality data across countries and a complete understanding of the financial history of each individual country, the cross-country empirical studies provide only little policy guidance (Ang, 2009). In order to overcome these limitations, researchers have proposed time series country-specific studies (see Demetriades and Hussein, 1996; Edwards, 1996; Neusser and Kugler, 1998; Ericsson *et al*., 2001; Kenny and Williams, 2001; Kirkpatrick, 2005; Ang, 2007, 2008).

2.2.2. Time Series Studies on Finance and Growth

The empirical literature examining the finance-growth relationship embodies the time- series techniques as well. These studies employ Granger-type causality tests, vector autoregressive (VAR) procedures, multivariate cointegrations and more. Since it is difficult to be able to find comparable data for a large number of countries, many of these studies are constrained by a few countries.

Gupta (1984) conducted the first and foremost time series investigation to study the finance-growth nexus for 14 developing countries using quarterly industrial output data to measure the level of economic development (Ang, 2009). His results showed that financial sector has an enhancing role in the process of economic development indicating that causality runs from financial development to economic growth. However, industrial output, which only represents a small portion of total output, is used as an indicator for economic development used in Gupta's (1984) study so that the results can not be considered satisfactory.

Jung (1986) applied Granger causality tests for 56 countries over the period 1950 to 1981 and similar to Gupta (1984) his results also supported for supply leading view, in other words finance promotes growth, yet again his results suffered from insufficient number of observations in the parametric estimation. Later, Demetriades and Hussein (1996) found out that the direction of causality frequently runs bidirectional, especially for developing economies.

Neusser and Kugler (1998) showed that the impact of finance on growth is particularly positive and strong when using measures of the value-added provided by the financial system instead of simple measures of the size of the financial system (Levine, 2003). In their study, they proxied financial development and economic growth with financial sector GDP and manufacturing GDP, respectively. Their causality tests were also consistent with the supply-leading view that finance plays an important role in economic development.

Rousseau and Wachtel (1998) employed time-series tests of financial development and growth for only 5 OECD countries during rapid industrialization period and with more comprehensive measures of financial development such as the assets of both banks and non-banks. Their results showed similarly that the direction of causality runs from financial development to economic growth strongly.

Rousseau and Sylla (1999) used a set of multivariate time-series models that includes measures of banking and equity market activity to investment, imports, and business incorporations over the 1790-1850 period. Their results strongly supported the supply-leading theory in United States. Later, Rousseau and Sylla (2001) moved outside the U.S and studied 17 countries during 1850-1997 again concluding that the financial development fostered economic growth. Again Rousseau (1999) applied a time-series study focusing on a single country, the Meiji period in Japan during 1868-1884, using VAR procedures. He concluded that financial sector served Japan's explosive growth.

Later Xu (2000), used VAR methodology in a broader study of 41 countries through 1960-1993 and rejected the hypothesis that finance simply follows growth. The VAR approach identified the long-run effects of finance on

growth by allowing for dynamic interactions among the explanatory variables and the study showed that financial development is important for long-run growth.

The contribution of banks and stock markets into economic growth is also investigated using time series tools. Arestis *et al*. (2001) employed Johansen cointegration, Vector Error Correction models (VECM) and weak exogeneity test using quarterly data for 5 developed economies and found that banks are more powerful in promoting economic growth rather than stock markets, though cross-country studies emphasize the role of stock markets more.

Bekaert, Harvey, Lundblad (2001, 2002) examined the effects of equity markets liberalization on economic growth using over-lapping data. They used data averaged over five-year overlapping periods to focus on growth rather than higher frequency relationships. Their results displayed that financial liberalization fosters economic growth by improving resource allocation and the investment rate.

Although many time-series studies enrich the finance-growth literature, they also have severe problems especially arising from the short estimation periods used due to data constraints. As it is obvious, reliable time series analysis requires long horizons in order to properly account for the underlying dynamics. In order to deal with the degrees of freedom problem, many studies identifies only one lag in their empirical model specification, however this yields serial correlation problems and /or under-identified models. A vast majority of the time series literature on finance-growth relationship suffer from omitted variable problem. Because of the limited data available, most studies identify whether a single equation or simultaneous equations model with few variables and lags. Another problem with time series studies is the misinterpretations of Granger causality. First of all Granger causality tests if lagged values of one variable helps predict current value of another variable so it is not a definite proof of a cause and effect relationship. Secondly, if firms expect stronger economic performance in the near future, they may invest more in financial services related investments in anticipation of higher future profits which in fact means that financial development is a leading indicator rather than a casual factor (Ang, 2009). Therefore, the findings on 'causality' must be cautiously interpreted.

2.2.3. Panel Studies on Finance and Growth

In more recent years, in order to ameliorate the short-comings associated with pure cross-sectional and time-series studies, the empirical literature concentrate on dynamic panel estimation methodology which takes both time dimension and cross-section, together, into consideration.

The first benefit from moving to a panel data approach is to incorporate both time-series and cross-sectional variation in the data. As it is known, in a pure cross-sectional regression model, the unobserved country-specific effect is part of the error term so its correlation between the independent variables yields biased estimates. So the second benefit from moving to a panel is that it avoids systemic biases associated with cross-country regressions. The third benefit is that it allows for instrumental variables for all regressors and thereby provides more precise estimates of the finance-growth relationship (Levine, 2009). Unlike the pure cross-sectional models, the panel estimator uses instruments based on previous lags of the regressors to consider the potential joint endogeneity problem[6]. De Gregorio and Guidotti (1995) applied panel data random effects for 12 Latin American countries during 1950-1985 and showed that unregulated financial liberalization leads to negative effect on growth. Their findings also showed that the main channel of transmission from financial development to economic growth is the efficiency of investment, rather than the volume.

Levine, Loayza and Beck (2000) and Beck, Levine, and Loayza (2000) used IV and generalized method of moments (GMM) estimation techniques over a panel data of 74 and 77 countries respectively spanning from 1960 to 1995. The data are averaged over 7 non-overlapping five-year periods. Levine, Loayza and Beck (2000) applied the Arellano-Bond (1991) and Arellano-Bover (1995) and Blundell-Bond (1998) dynamic panel estimation technique and used their "system estimator" to examine the relationship between financial intermediary development and growth; while Beck, Levine, and Loayza (2000) examine the relationship between financial development and the productivity growth, physical capital accumulation, and savings. Their results showed a positive relationship

[6] This method assumes that the regressors are only "weakly exogenous," which means that they can be affected by current and past realizations of the growth rate but uncorrelated with future lags of the error term. However, the method does not control for full endogeneity.

between the exogenous component of financial development and economic growth, productivity growth, and capital accumulation. The results of Levine, Loayza and Beck (2000) indicated that neither the simultaneity bias, the omitted country-specific effects, nor the usage of lagged dependent variables in cross-country growth regressions leads to strong positive relationship between economic growth and financial development. In addition, Beck, Levine, and Loayza (2000) argued that the link between financial development indicators and economic growth is robust.

Benhabib and Spiegel (2001) examined whether financial intermediary development affects economic growth, investment, and total factor productivity growth for a panel of 4 countries through 1965-1985. They used GMM panel estimator and found that the indicators of financial development are correlated with both total factor productivity growth and the accumulation of both physical and human capital. Their study departed from the previous counterparts since different financial development measures are linked with different components of growth (total factor productivity, physical capital accumulation,and human capital accumulation).

Rousseau and Wachtel (2000) revised the study of Levine and Zervos (1998a) using panel VAR and the difference estimator of Arellano-Bond (1991) and Arellano-Bover (1995) and Blundell-Bond (1998). Their results showed that the stock market liquidity and financial intermediation lead to higher per capita output, on the other hand, the stock market capitalizations is less effective.

Loayza and Ranciere (2002) studied the finance-growth relationship through a panel error correction model, where long-run and short-run effects are estimated jointly from a general autoregressive distributed lag (ARDL) following Peseran, Shin and Smith's (1999) Pooled Mean Group (PMG) estimator as an alternative to the traditional time-averaging methods. The results showed that a positive long-run relationship between financial intermediation and output growth exists together with a, mostly negative, short-run relationship. Furthermore, the positive link between long-run economic growth and financial

development was found to be smaller in countries that have suffered banking crises than the ones who didn't.

Beck and Levine (2003) also extended the Levine and Zervos' (1998a) study of stock markets, banks, and growth by enlarging sample span to 1998 instead of 1995 and using system estimator to diminish potential biases. They concluded that financial development enhances growth overall and both bank and stock market development significantly and positively contributes to growth yet differently.

Christopoulos and Tsionas (2003) performed panel unit root tests and investigated the long-run relationship between financial development and economic growth via panel cointegration analysis. They mentioned a number of concerns with the previous works on the issue due to the short time periods of data sets. Their results showed that there is strong evidence in favor of the supply-leading hypothesis, the relationship is significant and no bi-directional causality is evident. Furthermore, they found a unique cointegrating vector between growth, financial development and the ancillary variables such as investment share and inflation, which means there is a long- run relationship between finance and growth yet differently.

Calderon and Liu (2003) also found a bi-directional causality between financial development and economic growth employing the Geweke decomposition test on pooled data of 109 developing and industrial countries from 1960 to 1994. Their study also concluded that financial deepening contributes more to the finance-growth relationship in the developing countries than in the developed countries; and financial development fuels economic growth through both a more rapid capital accumulation and productivity growth.

Although the use of dynamic panel analysis incorporates the time dimension along with the cross-section and overcomes many problems mentioned before, this type of econometric analysis is also subject to omitted variable problems or heterogeneity bias when the unobserved country-specific effects are included in the error term which leads to biased and inconsistent estimates (Pesaran and Smith, 1995; Ang, 2009). As Wachtel (2003) and

Demetriades and Andrianova (2004) argued, taking country-specific effects as constant in panel regressions would generate a spurious aggregate relationship due to between-country differences rather than within-country differences over time. Thus, again one should be cautious while drawing any policy inferences from these analyses. Due to these difficulties in explaining growth by financial development and financial openness using macroeconomic data, a number of studies based on industry and firm-level data as well as event and case studies were performed.

2.2.4. Firm - Level Studies on Finance and Growth

For a better understanding of the relationship between financial development and economic growth, researches also examine the issue at the micro level by exploiting firm- or industry-level data across a broad cross-section of countries. These studies aim to resolve causality issues and to depict the underlying mechanisms, if exists, through which finance influences economic growth.

The seminal work by Rajan and Zingales (1998) argued that better-developed financial systems help overcome market frictions reducing the cost of external finance and hence facilitate firm growth and new firm formation. Using industry-level data with a new methodology over 36 industries across 42 countries, though the U.S. is dropped from the analyses since it is used to identify external dependence, authors showed that industries which are more dependent on external finance gain more in better-developed financial intermediaries and financial markets. Thus, financial development has a significant impact on industrial growth by influencing the availability of external finance (Levine, 2009). The study of Rajan and Zingales (1998) has influenced much researchers to study micro level data in order to examine the relationship between financial development and economic growth. Beck and Levine (2002) confirmed the findings of Rajan and Zingales (1998) using alternative measures of financial development.

Demirgüç-Kunt and Maksimovic (1998) investigated how differences in legal and financial systems affect firms' use of external financing to fund growth using a firm-level data consisted of accounting data for the largest

publicly traded manufacturing firms in 26 countries. The results showed that both banking system development and stock market development are positively related with the excess growth of firms. The findings were confirmed through various robustness checks, and later Beck, Demirgüç-Kunt, Levine, and Maksimovic (2001) confirm the findings using an extended sample.

Wurgler (2000) also studied industry-level data across 65 countries over the period 1963-1995. He computed an investment elasticity which directly measures the degree to which each country's financial system reallocates the flow of credit and used it along with the standard measures of financial development. The results showed that countries with higher levels of financial development increase investment more in growing industries and decrease investment more in declining industries than financially underdeveloped economies (Levine, 2009).

Claessens and Laeven (2002) examined the relationship between financial development and the availability of external funds along with the impact of legal systems that promote financial development. They found that countries with comparatively poor legal systems tend to have less external financing of firms. Love (2003) used firm level data from 40 countries to examine whether financial development eases financing constraints. Her paper found that the sensitivity of investment to internal funds is greater in countries with poorly developed financial system and financial development is particularly effective at easing the constraints of small firms.

2.3. Are Bank- or Market-Based Systems Better? Theory and Evidence

In addition to the existing debate on the role of financial development in economic growth, some studies have focused on the comparative merits of a bank-based financial system and a market-based financial system in promoting growth (Goldsmith, 1969; Boot and Thakor, 1997; Allen and Gale, 2000; Demirgüç-Kunt and Levine, 2001c; Beck and Levine, 2002; Ergungor, 2004; Levine, 2005). A large body of literature using different methodologies and datasets find that financial development has impact on economic growth . What about the effects of the financial structure?

Does having a bank-based or market-based financial system matter for economic growth?

The debate if financial structure, that is the degree to which the financial system of a country is bank- or market-based, matters for promoting growth or not begins with early works of Gerschenkron (1962) and Goldsmith (1969) referring Germany and the United Kingdom as representatives of bank- and market-based systems respectively. Typically, a bank-based system has relatively less developed financial markets since firms rely more on finance provided by banks rather than on financial markets. While banks play an important part in allocating resources to foster economic development, the importance of financial markets is huge especially in advanced economies. Great majority of the empirical literature on financial structure involves studies of Germany and Japan as bank-based systems and the United States and the United Kingdom as market-based systems. However, it is not appropriate to draw general conclusions about the long-run growth effects of bank-based and market-based financial systems based on only these four countries. Moreover, since their long-run growth rates do not differ very much, it may mislead to a conclusion that differences in financial structure did not matter much.

There are four views in the financial structure and growth literature: the bank-based view, the market-based view, the financial services view, and the law and finance view. The bank-based view suggests that intermediaries have the capacity to burden all vital roles of a financial system such as mobilizing resources, monitoring investments and dealing risk. The market-based view emphasizes the role of markets especially in diversifying risks, encouraging technological development and instantly responding capital needs. The financial services view points out that financial intermediaries are complementary to financial markets, hence the overall development of financial services is more important than the structure of the finance. The law and finance view, also states that the type of the financial system is of least importance, yet the legal enforcement of contracts is more crucial.

Beck, Demirgüç-Kunt, and Levine (2001) expanded the study of financial structure to a wider set of 150 countries from 1960-1995. Later, Demirgüç-Kunt

and Levine (2001b) used these data to classify according to the degree to which they are bank-based or market-based. Most of the empirical research on financial structure and growth use Demirgüç-Kunt and Levine's (2001b) measures of the degree to which countries are bank-based or market-based. Using different econometric methodologies, the literature agree that countries do not grow faster in either market-based or bank-based financial systems (Levine, 2009).

Proponents of bank-based systems argue that market-based systems suffer from fundamental shortcomings which will hurt resource allocation and economic performance. In well-developed markets, information is immediately revealed to investors at large, discouraging individual investors from devoting resources towards firms. Thus greater market development than that of bank development may in fact delay incentives for associating innovative projects that foster growth. A well-developed banking system, on the other hand, can mitigate the potential disincentives from efficient markets by privatizing the information, forming long-run relationships with firms and making investments without announcing their decisions public immediately , all of which have positive influences on resource allocation and growth (Boot, Greenbaum and Thakor, 1993; Levine, 2005).

A number of theories stresses that market-based systems do not effectively monitor managers (Shleifer and Vishny, 1997). Takeover threat may not be an effective corporate control mechanism since it also suffers from free rider problem (Stiglitz, 1985) and insiders do have better information than outsiders. In addition, existing managers often prevent takeovers and unfortunately hinder the disciplinary power of the markets. Finally, although in theory shareholder control management through a selective board of directors, a misappropriate relationship may arise between boards of directors and management (Jensen, 1993). Also, according to the bank-based view, the liquidity of stock markets can have adverse effects on resource allocation since, in liquid markets, investor can sell their shares inexpensively, so that they have little motivation to undertake an expensive corporate governance which will result in inefficient resource allocation. Banks, which do not suffer from such fundamental shortcomings as markets, will do a correspondingly better job at researching firms, overseeing

managers, and financing industrial expansion (Gerschenkron, 1962; Levine, 2005).

In contrast, market-based system, that is characterized by the presence of highly developed financial markets, is essentially a counterattack that focuses on the problems created by power banks. For instance, acquiring substantial inside information about firms, banks with power can have the ability to extract rents or more of the expected future profits from firms. This potential behaviour may reduce the attempt of firms to commit innovative and profitable ventures (Rajan, 1992; Boot and Thakor, 2000). Weinstein and Yafeh (1998) showed for Japan that firms with close ties to a "main bank" have greater access to capital and are less cash constrained than firms without a main bank. Additionally, the main bank firms tend (i) not to grow faster due to their conservative strategies, (ii) to use more capital inventive processes and (iii) to produce lower profits than firms without a "main bank" holding other features constant. Although banks may be effective at eliminating duplication of information gathering and processing, Allen and Gale (2000) note that this is valid only for standard environments yet banks become ineffective gatherers and processors of information in non-standard environments with new, uncertain innovations. Further, Dewatripont and Maskin (1995) demonstrate that compared to the concentrated banks, a more fragmented banking system can more easily commit to impose short-term, tighter budget constraints which may be necessary for the funding of newer, higher-risk firms. According to these theories, more market-based systems more easily support the growth of newer, riskier industries. Tadesse (2002) argued the relative effectiveness of bank-based versus market-based financial systems based on industry-level panel data of 36 countries and showed that market-based systems outperform bank-based systems among countries with developed financial sectors, while bank-based systems are better among countries with underdeveloped financial sectors. His results suggested that the financial architecture could be a source of growth.

Finally, proponents of market-based financial systems claim that markets provide a richer set of risk management options which allow

customized risk amelioration instruments with greater flexibility while bank-based systems may only provide inexpensive, basic risk management services for standardized situations. Thus, as economies mature, they mature in need of a richer set of risk management tools concomitantly benefiting from a legal and regulatory environment that supports the evolution of market-based activities, or overall growth may be retarded (Levine, 2005).

Aside from these, some reject distinguishing financial systems as bank-based or market-based (Merton, 1992, 1995; Merton and Bodie, 1995; Levine, 1997). According to this financial function view, the composition of the financial system is of secondary importance and the main issue is the overall financial development, not the type of the financial structure. Boyd and Smith (1998) developed a model showing that credit and equity markets function as complements rather than substitutes (Levine and Zervos, 1998a; Huybens and Smith, 1999; Ang, 2008). Beck and Levine (2002) used the Rajan and Zingales (1998) methodology concluding that financial structure does not help explain the differential growth rates across countries. Levine (2003) showed that after controlling for overall financial development the type of the financial structure does not have a role in explaining financial development and growth relationship. Demirgüç-Kunt and Maksimovic (2002) extended their previous study and showed that the degree to which countries are bank-based or market-based does not help explain growth. It should be noted that the Beck and Levine (2002); Demirgüç-Kunt and Maksimovic (2002); and Levine (2003) papers used aggregate, cross-country indicators to measure the degree to which countries are bank-based or market-based. These measures, however, may not sufficiently capture the comparative roles of banks and markets, hence, the conclusions from these studies must be viewed cautiously (Demirgüç-Kunt and Levine, 2001a). To sum up, there is no overall empirical support for either the bank- or market-based financial structure promotes growth better.

2.4. The Role of International Financial Integration: Theory

Financial openness, or international financial integration, can be defined roughly but not fully as the process through which a country's financial markets become more integrated with those in the rest of the world. This obviously requires

the elimination of restrictions on foreign financial institutions, providing cross-country financial services and establishing links between banking, stock, equity and other types of financial markets.

As being a part of the acts of financial globalization which especially have gained speed by 1980s, financial liberalization policies yield a rapid and substantial change in financial systems. Financial liberalization which brings international financial integration alongwith is the pushing power of financial globalization. As Obstfeld (2008) summarized, the developing world is in current account surplus compared to 90s, the rate of net external financing by richer countries has substantially increased and reserve accumulation has been multiplied what it was then. Even when China, Russia, and the Middle East are excluded, the current account deficit is much more smaller than 90s and reserve accumulation has been massive. Especially, the last 30 years have witnessed an increasing financial openness throughout the world. Since 1980s, there has been a vast increase in capital flows among industrial, and between industrial and developing countries. In the early and mid-1990s, a prior surge of private capital to developing countries from richer countries produce an extreme financial flow starting in Asia but spreading out to the Russian Federation and Latin America until the sub-prime crises in mid-2007 that originated in the industrial countries (Obstfeld, 2008). In some developing countries, these capital flows bring benefits and lead to higher growth rates, while it has been costly for a number of others which experienced serious crises.

There exists numerous mechanisms that can lead crisis. In emerging countries, there is a potential of chain reaction since all four elements of the economy- the currency market, the government finances, the banking sector, and the corporate sector— are interacting with eachother multidirectionally. So no matter where the problem has started,it spreads explosively through this chain mechanism. For instance,large government borrowing with instable government financing (as in Argentina in 2001) makes default unavoidable, which causes central-bank reserves to be melt down,the currency to be depreciated and financial intermediaries- with foreign currency liabilities and foreign currency lendings to domestic corporates which are also already in default- to be squeezed. Further, if financial system is underdeveloped, the currency depreciation can cause investment

to crash (Obstfeld, 2008). Another mechanism is the unique-equilibrium proposition by Krugman (1979), where an unsustainable fiscal deficit (as in the Southern Cone of the 1970s) leads to reserve loss, current account deficit, real appreciation, and collapse (Obstfeld, 2008). In other words, regardless of the mechanism, crises are very costly.

From the point of international financial integration, Obstfeld (2008) listed that there are at least five basic ways in which the international margin raises potential new problems: (i) Sovereignty (ii) Regulatory end-run (iii) Competitive forbearance (iv) Currency mismatch and (v) Contagion. Hence financial openness contains risks posed at least by these factors next to its potential and yet still undocumented net gains. As it can be clearly seen from the wide known dataset of Lane and Milesi-Ferretti (2007), there has been a rapid and massive expansion in gross foreign asset positions in recent years such that even small countries own gross foreign assets and liabilities nearly four times their GDP (Obstfeldt, 2008). These levels of gross foreign asset positions are much more than the minimum levels required to keep up a current account balance, thus, next to the advantage of risk sharing across countries, it also brings increased risk of counterparty failure within due to currency imbalance. At this point, institutional weakness due to underdeveloped financial development in developing countries magnifies instability and leads to transmission of perils through several channels, and, may even create new risks.

Thus, the growth effects of international financial integration and the risks and benefits it brings within is one questionable argument. According to some theories international financial integration enhances production specialization, capital allocation, and economic growth through risk sharing (Obstfeld, 1994; Acemoglu and Zilibotti, 1997). It is believed to have two major potential benefits – improving the global allocation of capital and helping countries to better share risk by reducing consumption volatility (Köse, Prasad and Terrones, 2003). On the other hand, several distinguished economists think oppositely. Especially, after the Asian debacle of 1997-98, prominent critics of financial globalization argued that its benefits are intangible and undocumented where its risks are enormous and real (Obstfeld, 2008).

Theory provides conflicting predictions about the growth benefits and costs of embracing financial openness. Many economists commonly agree that the primary benefit of international financial integration is the efficiency of *laissez-faire*. A more open and competitive international capital market induces a more efficient international allocation of capital. This is consistent with the conventional presumption about international financial integration, that is, capital should flow from high income countries that have relatively high capital-to-labor ratios to low income countries that have relatively low (Lucas, 1990). But even as cross-border capital flows have grown, suggesting a more financially integrated world, the distribution of flows becomes more perverse compared to what standard economic theory would predict (Prasad, Rajan, Subramanian, 2006).

Lucas (1990) noted that capital flows from industrial to developing countries were much smaller than the levels predicted by the theory. However, the fact that international capital flows mostly from poor countries to rich countries, which is referred to "Lucas Paradox" in the literature, is yet to be fully explained. Prasad, Rajan, and Subramanian (2006) showed that the paradox has intensified over time with capital flowing from poor to rich countries, especially strikingly since the beginning of this decade. The study displays that during 2000-2004, the pattern is truly contrary, with high and medium growth countries exporting signifiant amounts of capital while low-growth countries receive in huge amounts. Foreign direct investments (FDI) , in general, behave more in line with the theory but the perverse pattern of overall flows is apparent. As stated in Klein and Olivei (2000) and Levine (2001), the financial openness may develop a country's financial systems by importing better financial services and consequently derive positive growth effects.

On the contrary, there exists theories concerning the potential negative effects of financial openness. Some theories claim that financial openness would spur growth in countries with high financial development and institutional quality, while it retard growth in countries which are financially underdeveloped. Boyd and Smith (1992) show that financial openness in countries with weak financial institutions and legal systems may

actually induce a capital outflow to capital-abundant countries with stronger institutions hence slow down economic development. Krugman (1993) argued that international financial integration can not be a major driver of economic development and claims it is not solidly grounded either in economic theory or in the evidence of the past. Stiglitz (2000) pointed out that the increased frequency of financial crises is closely related with financial liberalization. Moreover, potential information asymmetries arising due to non-transparent financial institutions could lead to inefficient allocation of financial flows and result in severe crises (Stiglitz, 2004). Rodrik and Subramanian (2008) concluded that, the benefits of financial openness on growth are increasingly hard to find, even when financial crises are left aside. Authors claimed that financial globalization has not generated increased,higher growth, better consumption smoothing or reduced volatility in emerging markets; and argued that the evidence-based case for financial globalization are forced to resort to fairly indirect, speculative, and unpersuasive arguments.

As it is seen, theory provides conflicting predictions about the growth effects of financial openness. , hence a vast empirical literature try to answer the question of whether financial openness spurs long-run economic growth, and if yes, do these benefits outpoise the associated risks.

2.5. Financial Openness and Growth: Empirical Evidence

Although the theoretical ambiguity on the growth effects of international financial integration have produced a growing empirical literature, the issue is still complicated because of the difficulty in measuring financial openness (Edison, Levine, Ricci and Slok, 2002). Countries own a wide and complicated array of price and quantity controls on a wide and complicated variety of financial transactions. Thus, measuring is itself a big challenge and usually never efficient (Eichengreen, 2001). The empirical literature has developed a number of different financial openness measures and used them to analyze the implications of financial openness on growth and to draw policy conclusions.

The empiricial literature on financial openness and growth relationship can be reviewed in two parts: first is the evidence on direct channels, and second is the evidence of indirect channels. The studies on direct channels seek for a solid positive association between financial openness and economic growth, the studies on indirect channels claim that positive growth effects from financial openness are only collateral can be derived through better financial development, institutional quality, legal environment and macroeconomic policies (Bekaert, Harvey, Lundbland, 2005).

No robust empirical evidence indicating that financial integration spurs growth through direct channels as claimed by the standard theory is found so far in the literature. Moreover, in standard theory, capital is claimed to flow from relatively capital -rich countries to relatively capital-scarce countries, however, it is seen that capital has been flowing reversely in recent years, i.e. from the developing economies to the advanced economies.

In theory, there are major direct channels through which countries derive growth benefits from financial openness. One of those channels of gain is reduced level of consumption relative to output volatility due to improved risk sharing. Empirically, there is no evidence that international financial integration yields such consumption smoothing in developing countries. Prasad *et al*. (2003) grouped countries as industrial, more financially integrated (MFI), and less financially integrated (LFI) and examined the median volatility of income and consumption for each group. Their results showed that consumption growth volatility decrease in the industrial and LFI economies, but increase in the MFI countries especially through 1980s and 1990s of high liberalization. Furthermore, authors showed that income-growth volatility fell in all three groups with least reduction in the MFI group. In a very detailed paper of Bekaert *et al.* (2006), the authors used a capital-account openness measure based on the ratio of investable to total equity market capitalization. Using a sample of 90 countries including already liberalized industrial economies, their results showed that equity-market liberalization has a significantly negative effect on volatility. And for a sample of 40 developing countries, the results showed that the volatility-reduction effect of equity market liberalization is small and statistically insignificant. Though, this study was criticized for the chosen regressors which are insufficient in fully explaining macro volatility.

A second major channel which financial openness enhance economic growth is proposed as the mitigation of capital scarcity through foreign capital inflow. Gourinchias and Jeanne (2006b) conclude that poorer countries have lower per capita income because they have lower productivity or more distortions than richer countries so that the access to foreign capital flows would not generate much additional growth in these countries. In fact, the basic problem with the poorer countries is generally due to low protection of property rights which do not encourage investors for capital inflow from richer lenders. Prasad, Rajan, and Subramanian (2006) emphasized the "Lucas puzzle" stating that, as opposed to the theory, capital has tended to flow from poor to rich countries, rather than from rich to poor since 2000s. Only FDI seems to follow the conventional pattern of flowing from rich to poor countries, and within the developing countries from richer to poorer within the developing countries (Obstfeld, 2008). Both Prasad, Rajan, and Subramanian (2006) and Aizenman, Pinto, and Radziwill (2007) showed that growth is significantly positively correlated with the net capital outflow for developing countries, whereas the opposite correlation is seen for industrial countries. Later, Prasad, Rajan, and Subramanian (2007) stated that "nonindustrial countries that have relied on foreign capital have not grown faster than those that have not.". Even, foreign capital inflows to financially underdeveloped systems can lead to overvaluations and financial instability that may result in reduced growth.

Edison, Levine, Ricci and Slok (2002) use newly developed panel techniques that control for simultaneity bias, the bias induced by the standard practice of including lagged dependent variables in growth regressions, and the bias created by the omission of country specific effects in empirical studies of the international financial integration-growth relationship through a wide array of measures of international financial integration for 57 countries. The hypothesis that international financial integration does not accelerate economic growth even when controlling for particular economic, financial, institutional, and policy characteristics, can not be rejected by the data.

At macroeconomic level, growth regressions carried out by Borensztein *et al*. (1998) and Carkovic and Levine (2003) find little support that FDI has an exogenous positive effect on economic growth. Javorcik (2004) find

evidence that foreign direct investment raises productivity growth through vertical spillovers, which originate from the interactions between foreign firms and their local suppliers and customers, rather than horizontal spillovers, which are associated with productivity spillovers from foreign firms to domestic firms in the same sector.

As it follows financial openness, the role of foreign direct investment (FDI) in total capital flows has increased in the past decade. In 1998, FDI accounted for more than half of all private capital flows to developing countries. The reason behind is the belief that FDI has several positive effects which include productivity gains, technology transfers, the introduction of new processes, managerial skills, and know-how in the domestic market, employee training, international production networks, and access to markets. These benefits, in addition to the direct capital financing it generates, suggest that FDI can play an important role in modernizing the national economy and promoting growth (Alfaro, Chanda, Kalemli-Ozcan, and Sayek, 2004).

Research focusing on capital account openness finds mixed results, but articles focusing on equity market liberalization typically find significant positive average growth effects from liberalization (Bekaert *et al.*, 2006). Equity market liberalization is a specific type of capital account liberalization, which is a decision to allow capital in all forms to move freely in and out of the domestic market. Henry and Sasson (2008) find that equity market liberalizations are associated with an increase in the growth rate of labor productivity in emerging market economies.

Bonfiglioli (2007), and Köse, Prasad, and Terrones (2008) perform macro studies on the impact of overall financial integration on total productivity growth. Bonfiglioli's findings based on a cross-country data over the period 1975-99 suggest that financial integration has a positive direct effect on productivity growth. Köse, Prasad, and Terrones (2008), on the other hand, starting with some simple cross-section regressions and then moving on to dynamic panel regressions, find strong and robust evidence that financial openness indicated by de jure measures has positive effect on medium-term

productivity growth, while the effect of de facto financial openness is less clear. Bekaert, Harvey and Lundblad (2009) showed that the impact of financial openness on factor productivity growth is more important than the effect on capital growth decomposing the per capita output growth effect into two channels: changes in factor productivity and investment growth and find out that factor productivity is the more important channel.

Köse *et al*. (2006) usefully delineate four sets of structural features of an economy that can affect the level of benefits countries reap from financial inflows: financial development and regulation, general institutional quality, the macro policy setting, and the degree of trade openness (Obstfeld, 2008).

Meanwhile, a diverse empirical literature shows that benefiting from financial openness also requires a level of financial development, and it has a large causal effect on economic growth by primarily affecting total factor productivity growth (Levine, 2001); like the age-old dilemma of a chicken and egg story, the question whether financial development causes or is caused by growth is one major ambiguity in the finance-growth literature. It is unlikely that the openness effect is the same in all financially liberalizing countries, this heterogeneity in the growth effects is related to the degree of financial development, quality of institutions and legal environment(Bekaert, Harvey, Lundbland, 2005). Bekaert *et al*. (2005) analyze the effects of equity market liberalizations and their results provide two insights: first, equity market liberalization adds something over and above for financial development, and second, the level of financial development matters.

Edison, Levine, Ricci, Slok (2002) examined whether the financial openness-growth relationship depends on the level of financial development proxied by banking sector development and stock market development respectively using advanced measures of financial openness and econometric methods that cope with statistical biases. The data do not lend statistical support for the view that financial integration exerts a positive influence on growth in countries with high levels of bank or stock market development although financial openness is associated with growth. But these results must be interpreted hesitantly since there is evidence that domestic financial

development spurs growth under the *right* conditions such as the quality of bank supervision, the quality and transparency of corporate governance, or may be more traditional macro fundamentals (Obstfeld, 2008).

Alfora, Chanda, Ozcan, Sayek (2004) take the issue from foreign direct investments point and argued that the lack of financial development can limit the economy's ability to use potential foreign direct investment spillovers for self-benefits.

Baltagi, Demetriades, and Law (2008) addresses the emprical question of whether trade and financial openness can help explain the recent pace in financial development, as well as its variation across countries. It also tries to answer the question of whether the simultaneous opening of both the trade and capital accounts is necessary to promote financial development. Dynamic panel estimation techniques performed on annual data from industrialized and developing countries show that both types of openness are significant determinants of banking sector development. Authors provide partial support to the well known Rajan and Zingales (2003) hypothesis, which stipulates that both types of openness are necessary for financial development to take place. The empirical evidence presented in the paper also confirms the quantitative importance of the mechanisms of financial development that emphasizes political economy factors espeially highlighted in recent literature.

Köse *et al*. (2008) show that, given their level of financial development, the total factor productivity benefits of financial integration are most evident in developing countries when they receive inflows in the form of foreign direct investment or portfolio equity.

A diverse empirical literature, besides, examine the effectiveness of financial intermediaries and through firm-level studies (Demirgüç-Kunt, Maksimovic, 1998), industry-level studies (Rajan and Zingales, 1998), time series studies(Neusser and Kugler, 1998; Rousseau and Wachtel, 1998), and cross-country studies using both traditional econometric methodologies and modern ones including instrumental variables, omitted variable biases and potential simultaneity methodologies (King and Levine, 1993a,b; Levine, 1998,1999; Beck

et al., 2000; Levine *et al.*, 2000) find that the level of financial intermediary development has a large, causal effect on long-run economic performance. At the industry level, Rajan and Zingales (1998) find that the state of financial development reduces the cost of external finance to firms, thereby promoting growth. Combining industry and country level data, Wurgler (2000) shows that even if financial development does not lead to higher levels of investment, it seems to allocate the existing investment better and hence promotes economic growth.

2.6. Institutional Quality

Throughout the studies in the literature, researchers see that while financial development and financial openness effectively foster growth in some countries, they are not doing so in some other countries. One reason for this conflict may due to institutional factors. In fact institutional factors may have a potential and crucial role in determining how financial development and financial openness affect growth (Arestis and Demetriades, 1997). Most economists agree that every individual economy must preserve its domestic health and render their financial structure robust to crises. If the domestic financial system is not sound then financial openness can bring potential instability rather than growth benefits. In fact, empirically, many crises, for instance the one in Japan, have been exacerbated by the opening of unsound systems to capital flows with the resulting levering-up of preexisting risks (Obstfeld, 2008).

Thus, a largely investigated potential financial source of long-term growth is the institutional quality in countries, such as the quality of bank supervision, the quality and transparency of corporate governance, the state of domestic financial development, the legal environment, the level of corruption, and the reliability of enforcement of domestic property rights. Similar to financial development, again the usual problem is in measuring the institutional quality (Obstfeld, 2008).

Institutional quality is especially a fragile matter for financially more open countries. Institutional weakness not only can lead to crises in developing countries; such weakness may severely limit the gains from

international asset trade, too. After the major Asia financial crises, for example, Haber (2002) and Krueger (2002) pointed out that the "crony capitalism" which was a result of corruption and weak public governance as the kingpin of the crisis.

In general, financial openness itself can also yield "collateral" institutional benefits for the economy, benefits that both spur growth and make an open financial account less crisis-prone (Köse *et al*. 2006). Bekaert *et al.* (2005) found that the positive effect on growth is largest when the quality of institutions and the level of financial development are high such that the growth prospects from a liberalization are almost three times higher for countries with a higher than median level of the quality of institutions.

Chinn and Ito (2005), performing a panel analysis of 108 countries over the years 1980–2000, showed that, once a critical threshold of "legal and institutional development" has been reached, further progress in that dimension directly fosters the development of equity markets, and also interacts positively with financial openness to promote equity-market growth. In another study, Bekaert *et al*. (2008) documented that the quality of institutions significantly drive the size of the growth response in both capital stock and factor productivity.

Klein (2005) used up to 71 countries and applied cross-section ordinary least squares and instrumental variables (IV) approach found that a positive correlation between growth and financial openness is associated with medium levels of institutional quality. In order to measure institutional quality, they used a composite indicator based on the 1984 to 1995 average of five series; namely, Bureaucratic Quality, Control of Corruption in Government, Risk of Expropriation, Repudiation of Government Contracts, and Rule of Law (from the data set constructed by Steve Knack and Philip Keefer of the IRIS Center at the University of Maryland). Arteta, Eichengreen, and Wyplosz (2003) and Quinn and Toyoda (2006), and Carkovic and Levine (2005) used a variety of econometric techniques from cross-sections to panel data procedures agreed that better institutional quality seem to have positive significant effect on promoting growth through financial openness. Köse, Prasad and Taylor (2009) identified some certain

"thresholds" for institutional development which needs to be attained in order to derive growth benefits and to diminish associated risks from financial openness.

A newly evolving literature takes the regime characteristic and democratic ability of countries into consideration as a broader alternative to institutional quality. As noted by Girma and Shortland (2008), the traditional indicators of institutional quality are already in part of the political regime characteristic, so that the more democratic the country the better developed the institutions are. Tabellini (2005), Persson and Tabellini (2008) and Cavallo and Cavallo (2010) noted that the political factors of which institutional quality is only a part, play significant role in finance and growth relationship.

CHAPTER 3

BASIC STYLIZED FACTS

Before embarking on the estimation of the effects of financial development and financial openness on economic growth, we introduce and summarize the data, present some basic stylized facts and figures displaying the evolution of financial flows, and study the contemporaneous relationship between financial development, financial openness and growth. Since an efficient study of finance and growth relationship necessarily requires construction of precise measures to proxy for financial openness and financial development, this chapter will start with a brief definition of those.

3.1. Measures of Financial Openness

Before proceeding with general and more specific data analysis and estimation, the very first task should be to define measures of financial openness. Researchers have devised both *de jure* and *de facto* quantitative measures of a country's integration with global capital markets[7]. The concept and the meager definition of financial openness brings a number of measurement problems. In order to carry out efficient analyses about the effects of financal integration on economic growth and derive appropriate policy implications, these measurement issues should be challenged. Many researchers attribute the inconclusive findings on financial integration and growth to these measurement problems. Similarly, the nonexistence of no certain thresholds categorizing the countries as less or more financially integrated may matter. This section reviews the evolution of a number of well-known and widely used financial openness measures.

[7] De jure is an expression that means "concerning law", as contrasted with de facto, which means "concerning fact".

Most of the initial empirical literature consider that capital account liberalization pioneers for financial openness. Therefore, the most common method in those studies is to use an index of openness based on the legal restrictions on cross-border capital flows as a measure of financial openness. Such restrictions involve controls on inflows versus those on outflows, quantity versus price controls, restrictions on foreign equity holdings, etc. (Köse *et al*., 2010). These are the *de jure* measures, which are based on IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and often constructed of a binary indicator – a 0 or 1- of capital account openness. Some studies have extended these measures like using a "share" measure which is equal to the ratio of years in which a country's capital account was open in the sample[8] (Köse *et al*., 2010). Others have used the all the information available in the AREAR and construct more sophisticated capital accout measures with an extended set of index or indicators. One such widely used *de jure* measure is of Chinn and Ito's (2006) AREAR based measure of capital controls. Generally called as KAOPEN, it is an index based on the binary dummy variables that codes the restrictions on cross-border financial transactions reported in the IMF's AREAER (Ito and Chin, 2011). However, no matter how sophisticated, none of these measures capture the degree, the effectiveness and the intense differences of enforcement of capital controls, and hence may not measure the actual extent of financial openness of a country. Additionally, the strong element of endogeneity in *de jure* measures may create potential estimation problems.

Due to the severe deficiencies of *de jure* measures, more direct measures of financial openness based on the gross and net financial flows/stocks and their components are developed in the literature. These *de facto* measures appear to be the best available indicator of a country's integration with global financial markets (Köse *et al.,* 2010)[9].

[8] Share measures have been created by Grilli and Milesi-Ferretti (1995), Rodrik (1998), and Klein and Olivei (2006). Finer measures of openness based on the AREAER have been developed by Quinn (1997, 2003), Miniane (2004), Chinn and Ito (2006), Mody and Murshid (2005), and Edwards (2005).

[9] Other quantity-based measures of integration include measures of asset market integration and saving-investment correlations (refer to Karolyi & Stulz, 2003; Obstfeld & Taylor, 2004). These measures are difficult to apply and interpret for an extended period of time and for a large group of countries, so not preferable especially in time series an panel studies.

De facto measures can either be based on price differentials or on quantities. Price-based measures takes into account that the true degree of integration of capital markets should be evident in common prices of similar financial instruments across countries regardless of the amount and direction of flows. These type of measures are problematic especially in emerging market economies due to the difficulties in risk and liquidity quantification. Other measures of capital market integration include saving-investment correlations and/or interest parity conditions which are also difficult to apply in long time and large country sets (see Frankel, 1992; and Edison, Klein, Ricci, and Slok, 2002).

The quantity-based *de facto* measures of openness based on actual flows on the other hand are the best available measure of a country's integration with international financial markets among the existing ones. Lane and Milesi-Ferretti (2003) have constructed a comprehensive data set of external wealth of countries for over 140 countries, and enlargen and extend it on a regular basis. The data set contains information about the stocks of gross liabilities and assets, the composition of international financial positions, foreign direct investment, portfolio equity investment, external debt, and official reserves for a huge panel data set.

The choice between these *de facto* measures can vary according to the researcher's interest. The measure of financial integration based on the sum of total inflows and total outflows (gross flows) is less volatile and more adventageous since it captures the flows both-way. On the other hand, the financial openness measure can also be created using the difference between inflows and outflows (net flows). No matter which, the *de facto* measures do have measurement errors, too. Recently, widely used *de facto* financial openness measures are constructed using the study of Lane and Milesi-Ferretti (2003) and Lane and Milesi-Ferretti (2007) "External Wealth of Nations Data set".

Köse *et al.* (2008) discuss the relative merits and drawbacks of each of these measures of financial openness. In short, none of the available measures is close to ideal for empirical work aiming to assess the linkage between financial openness and growth, yet both contain important information. However, although *de facto* measures do also have some shortcomings, they better depict the degree of a country's financial integration into

global markets compared to the *de jure* alternatives. Thus, these type of financial openness measure better suits to many empirical studies.

3.2. Measures of Financial Development

Financial systems has become more and more intense by all means for over a few decades. A number of indicators have been used in attempts to measure the financial development of economies. By 1999, the World Bank officially began publishing a database including a wide array of indicators of financial development and financial structure across countries. One widely used and sophisticated World Bank study is developed by Beck, Demirgüç-Kunt and Levine (2000) with information from the World Bank's World Development Indicators (WDI) and the International Monetary Fund's International Financial Statistics (IFS). This data set which is updated and expanded on a regular basis focuses on banks and bank-like financial institutions and includes indicators for the size of the financial system such as liquid liabilities to GDP, currency outside banking system to base money, financial system deposits to GDP; for size, structure, and stability of the banking system; and for capital markets , the insurance sector, equity markets and private bond markets[10].

Additionally, International Financial Corporation (IFC) of World Bank constructed a Doing Business Database which contains several quantitative measures on regulations, efficiency of the financial infrastructure, enforcement, and creditor rights[11]. Another attempt to measure financial development has been made recently in a study by Dorrucci, Meyer-Cirkel, and Santabárbara (2009) for European Central Bank. The study uses twenty-two variables, grouped according to three broad dimensions: institutions and regulations, size of and access to financial markets, and market performance and constructs composite indexes to measure domestic financial development in twenty-six emerging economies (Krishnan, 2011).

[10] See Beck and Demirgüç-Kunt (2009)

[11] This database has a number of limitations and hence does not fully capture the financial development of a country. See www.doingbusiness.org.

3.3. Data

Our data set, composed of macroeconomic and financial variables, covers the period 1960-2007 and is constructed based on a number of sources provided in Appendix A. It comprises a total of 105 countries and throughout the empirical analyses, from time to time, they are grouped into 24 industrial (IND), 24 emerging (EMG), 43 other developing (ODC) and 14 eastern European (EE) countries[12]. The members of each group is presented in Appendix B. The data is nested in an unbalanced panel data structure[13].

The variables of interest in this study are meticulously chosen in order to be able to investigate if there exists a relationship between finance and economic growth and if yes, how and to what extent. The dependent variable we seek to explicate is the real per capita gross domestic product (GDP) as commonly used in the growth literature. The set of independent variables are constructed from a number of financial and macroeconomic variables.

One of our key regressors, the financial openness indicator, is constructed based on the study of Lane and Milesi-Ferretti (2003), and Lane and Milesi-Ferretti (2007) "External Wealth of Nations Dataset Mark II" on foreign assets and liabilities and, as suggested by the authors, is calculated as follows:

$$FO = \frac{\text{Total Liabilities-Debt Liabilities} + \text{Total Assets-Debt Assets}}{\text{GDP}}$$

which is a *de facto* measure. Note that holdings of foreign assets and liabilities involves accumulation of holdings of assets and liabilities in foreign direct investment, portfolio equity, financial derivatives and debt.

Other primary independent variable in the study aims to capture the level of financial development. We chose two indicators developed by Beck, Demirgüç-Kunt and Levine (2000) and used one throughout the study while used

[12] The categorization of countries is mainly based on the study of Köse *et al.*, 2009, and International Money Fund (IMF)'s World Economic Outlook, April 2011. The eastern European countries are mainly remainings of the old eastern block.

[13] In an unbalanced panel data setting, the number of time periods, T_i differs across cross-sections.

the other to check the robustness of our results[14]. The first one, denoted by FD, is the ratio of **Liquid Liabilities to GDP.** As being a traditional indicator of financial depth, it is the the broadest available indicator of financial development since it includes all financial sectors. FD is equal to currency plus demand and interest-bearing liabilities of all banks, bank-like and non-bank financial institutions divided by GDP[15]. The second measure of financial development is chosen as an indicator which captures one of the most important functions of financial intermediaries – credit allocation. Private Credit by Deposit Money Banks to GDP equals to the claims on the private sector by deposit money banks divided by gross domestic product (Beck, Demirgüç-Kunt and Levine, 2000).

Following the literature, the control variables for other potential determinants of economic growth in the study are the trade openness (TO) measured as the sum of exports and imports divided by GDP, ratio of the secondary school attainment in the population to control for human capital (SEC)[16], inflation rate (INF) as average annual changes in the consumer price index, the ratio of government expenditures to GDP (GOV), and the initial level of GDP per capita . All variables are collected on an annual basis.

One of the goals of this study is to derive conclusions whether the effects of financial development and financial openness on growth change as the level of institutional development in a country changes. In other words, if there exists indirect benefits of financial integration and financial development on growth. To this end, we use the "combined polity score" -*polity2* - variable as constructed by the Polity IV database (Marshall, *et al.*, 2003) to proxy instutional development[17]. The *polity2* index is designed to record a regime's

[14] See Appendix D

[15] The International Financial Statistics (IFS) defines three distinct groups of financial institutions: the first group includes the central bank and other institutions performing under monetary authority; the second group, deposit money banks, includes all financial institutions that have liabilities in the form of deposits transferable by check or otherwise; and the third group includes other banklike institutions and nonbank financial institutions which serve as financial intermediaries, and used as means of payment (Beck, Demirgüç-Kunt, 2000), [IMF 1984, 29].

[16] The average years of secondary school enrollment is generally preferred in the finance-growth literature, though our conclusions do not differ when it is used to proxy human capital instead of the percentage ratio.

[17] See Polity IV project Dataset and Users Manual for details, (Marshall, *et al.*, 2003)

institutional and authoritarian characteristics and mesures the degree to which a regime owns autocratic or democratic features[18]. The *polity2* score ranges from -10 (full autocracy) to 10 (full democracy) and provides a qualitative measure of democratic institutions such as the existence, regulation, competitiveness and the level of political participation; how political leaders are selected; civil liberties and institutionalized constraints on the governing power (Cavallo and Cavallo, 2010). Higher scores of *polity2* indicate a higher degree of democracy. The *polity2* variable therefore appears to be a reasonable proxy of institutional development.

Since the traditional indicators of institutional quality such as rule of law, corruption, government effectiveness and transparency are already in part of the political regime characteristic, i.e. the *polity2* variable, (Tabellini, 2005; Persson and Tabellini, 2008; Girma and Shortland, 2008; and Cavallo and Cavallo, 2010) it is obvious that the more democratic the country the better developed the institutions are. As noted by Persson and Tabellini (2008), the threshold of "0" for *polity2* corresponds to a generous definition of democracy. Therefore, following Persson and Tabellini (2008), we define *polity2*=0 as our threshold variable to proxy the level of institutional development where strictly positive values of *polity2* indicates democracy and better institutional quality (institutionally developed), and the negative values stand for lower institutional development (institutionally under-developed).

3.4. Stylized Facts

3.4.1. Descriptive Statistics

Before proceeding with the estimation of the effects of financial development and openness on economic growth, some descriptive statistics of the data is presented in Table.1. Similarly Table.2 provides basic

[18] The database first of all records a democracy score ranging from 0 to 10 for each country, based on the openness of the political process and the degree of restraints on the powers of the chief executive. Secondly, each country has an autocracy score again ranging from 0 to 10, with 0 denoting non-autocratic, based on how political leaders are selected, the constraints on their powers and the regulation and competitiveness of political participation. If polities have mixed authority traits, they are given scores in both the democracy and the autocracy index. Subtracting the autocracy score from the democracy score of a country creates the *polity2* variable (Girma and Shortland, 2008).

descriptive statistics according to the level of development of the economy. The means, within- and between- variances and pairwise correlations are derived both for the overall sample and for the country samples. These statistics are derived from an unbalanced panel data set with annual observations.

As it is seen in Table.1, the overall mean level of growth for 105 countries is 3.8 and the within-countries variability in growth is nearly three times larger than the between-countries variability. On the contrary, the within and between variability of log real income do not differ very much. For our whole sample data set the overall mean level of financial openness and financial development is approximately found to be 0.5 both, which are moderate since the other developing countries involving a large number of small and/or economically problematic countries dominate the sample. The between and within country variation of financial integration and those of financial development do not differ significantly. The variation due to the interaction between samples and within each individual sample in terms of real income are nearly close to eachother.

The highest mean growth rate for GDP per capita is seen in emerging economies (EMG) with 4.84 followed by other developing countries (ODC) with an average rate of 3.8. The lowest mean growth rate arises in eastern European countries among all. Except for advanced economies for all other country groups within-countries variability in growth is nearly 3 times larger than the between-countries variability. Though most of the variability in the data occurs between-countries, yet some variables for some country groups, such as financial openness measure and polity2 variable in eastern European (EE) group and inflation rate in emerging economies have large within-country variability.

The highest mean value for financial openness arises in industrial countries (IND) which is expected since advanced economies have been largely integrated to the internatinoal markets for a long time. The emerging economies (EMG) and the eastern European (EE) countries come next with an average financial openness of 40% while the smallest mean value for FO, is

Table.1. Whole Sample Summary Statistics

Variable		Mean	Std. Dev.	Obs.
Δ(Y)	Overall	3.8484	4.8832	NxT = 4240
	Between		1.6495	N = 105
	Within		4.6543	T = 40.4
Y	Overall	26.2232	2.9873	NxT = 4345
	Between		2.9081	N = 105
	Within		0.5088	T = 41.4
FO	Overall	0.4816	0.7939	NxT = 3451
	Between		0.5236	N = 105
	Within		0.5953	T = 32.8
FD	Overall	0.4591	0.3130	NxT = 3531
	Between		0.2839	N = 105
	Within		0.1560	T = 33.6
TO	Overall	0.6446	0.4106	NxT = 4169
	Between		0.4792	N = 105
	Within		0.1873	T = 35.7
Polity2	Overall	2.9871	7.2230	NxT = 4124
	Between		5.6475	N = 103
	Within		4.3541	T = 40.0
INF	Overall	0.2671	2.5900	NxT = 3749
	Between		0.6274	N = 103
	Within		2.5149	T = 36.4
GOV	Overall	14.6573	5.5853	NxT = 4166
	Between		4.8217	N = 104
	Within		3.1404	T = 40.1
SEC	Overall	24.7428	17.0478	NxT = 3029
	Between		15.7770	N = 79
	Within		7.5127	T = 38.3

Table.2. Summary Statistics According to the Level of Development

Variable		INDUSTRIAL COUNTRIES			EMERGING COUNTRIES		
		Mean	**Stdev.**	**Obs.**	**Mean**	**Stdev.**	**Obs.**
Δ(Y)	Overall	3.6077	2.9883	1113	4.8499	4.3700	1047
	Between		1.1284	24		1.7028	24
	Within		2.7766	46.4		4.0881	43.6
ln(Y)	Overall	26.5897	2.3877	1113	27.4061	3.0667	1071
	Between		2.3754	24		3.0481	24
	Within		0. 4879	47.4		0.6572	44.6
FO	Overall	0.8402	1.2982	901	0.4203	0.6528	863
	Between		0.8373	24		0.4867	24
	Within		1.0520	37.5		0.4319	36.0
FD	Overall	0.7054	0.3717	1034	0.4473	0.2666	858
	Between		0.3773	24		0.2111	24
	Within		0.2128	43.1		0.1683	35.8
TO	Overall	0.7135	0.5013	1127	0.5389	0.4508	1012
	Between		0.4638	24		0.7857	24
	Within		0.2040	46.9		0.1917	42.2
Polity2	Overall	9.1614	3.3796	1137	2.8799	6.4434	1066
	Between		1.9260	24		4.5901	24
	Within		2.7994	47.375		4.6848	44.4
INF	Overall	0.0604	0.0677	1072	0.6586	5.0079	974
	Between		0.3345	24		1.1756	23
	Within		0.0592	44.7		4.8886	42.3
GOV	Overall	17.6097	4.6514	1112	13.1999	5.7441	1061
	Between		3.9189	24		5.1790	24
	Within		2.6197	46.3		2.9737	44.2
SEC	Overall	40.8325	14.9536	924	23.2499	12.0869	850
	Between		12.1899	23		10.9253	22
	Within		9.2217	40.2		7.2115	38.6

Table.2. *continues*

Variable		OTHER DEVELOPING COUNTRIES			EASTERN EUROPE COUNTRIES		
		Mean	**Stdev.**	**Obs.**	**Mean**	**Stdev.**	**Obs.**
Δ(Y)	Overall	3.7691	5.4495	1730	2.0095	7.0852	350
	Between		1.3938	43		1.4375	14
	Within		5.3204	40.2		6.9445	25.0
ln(Y)	Overall	25.3968	3.1152	1773	25.6239	2.3683	364
	Between		3.1211	43		2.1291	14
	Within		0.4553	41.2		0.2592	26.0
FO	Overall	0. 2982	0.2542	1467	0.4770	0.3536	220
	Between		0.1895	43		0.1502	14
	Within		0.1713	34.1		0.3214	15.7
FD	Overall	0.2981	0.1573	1439	0.3948	0.1684	200
	Between		0.1292	43		0.1526	14
	Within		0.0963	33.5		0.0883	14.3
TO	Overall	0.6070	0.2740	1735	0.9659	0.3423	295
	Between		0.2356	43		0.2708	14
	Within		0.1632	40.3		0.2331	21.1
Polity2	Overall	-0.9060	6.7753	1734	4.5336	6.7368	283
	Between		4.9296	43		3.7744	14
	Within		4.6973	40.3		5.4581	20.2
INF	Overall	0.1364	0.2174	1466	0.4015	1.3684	237
	Between		0.1216	42		0.4352	14
	Within		0.1852	34.9		1.2976	16.9
GOV	Overall	13.2799	5.2342	1672	16.4215	5.3093	321
	Between		4.4209	42		4.1229	14
	Within		3.5503	39.8		3.0693	22.9
SEC	Overall	13.5198	11.1148	1214	25.3950	11.952	41
	Between		10.4624	33		.	1
	Within		5.9224	36.8		11.952	41

seen for other developing countries (ODC) by 30%. Similar interpretation is valid of financial development is highest in advanced economies, later the emerging and eastern European countries, while the smallest mean value is seen in other developing countries.

As it is mentioned before, *polity2*=0 is our threshold value to determine whether a country is institutionally underdeveloped (if below threshold) or institutinally developed (if above threshold). As it is anticipated the largest mean level of *polity2* is 9.1 for industrial countries while it is below 0 for other developing countries. Hence these two country groups stand at two distinct points in terms of institutional quality. The mean level for emerging economies is approximately 3.0 again above the threshold value.

After descriptive statistics, the panel data pairwise correlations matrix for the interest variables are reported in Table.3 both for overall sample and for each sample group -. The overall signs between variables do not lead to an apparent relationship between growth and interest variables. Growth and financial openness has a positive linear relationship both in cross-section and panel data framework while the sign and magnitude of the linear relationship between financial development and growth changes for each category.

Table.3. Pairwise Correlation Matrices

(a) Panel Data Whole Sample

	Δ(Y)	**ln(Y)**	**FO**	**FD**	**TO**	**Polity2**	**INF**	**GOV**	**SEC**
Δ(Y)	1.00								
ln(Y)	0.02	1.00							
FO	0.05	-0.01	1.00						
FD	-0.04	0.10	0.52	1.00					
TO	0.06	-0.19	0.62	0.38	1.00				
Polity2	-0.07	0.08	0.22	0.31	0.20	1.00			
INF	-0.10	-0.01	-0.04	-0.06	-0.05	0.02	1.00		
GOV	-0.15	-0.07	0.07	0.23	0.22	0.23	-0.03	1.00	
SEC	-0.04	0.17	0.33	0.51	0.26	0.60	-0.03	0.39	1.00

Table.3. *continues*

(b) Panel Data Industrial Countries

	Δ(Y)	ln(Y)	FO	FD	TO	Polity2	INF	GOV	SEC
Δ(Y)	1.00								
ln(Y)	-0.14	1.00							
FO	0.12	-0.05	1.00						
FD	-0.06	0.25	0.49	1.00					
TO	0.17	-0.40	0.66	0.36	1.00				
Polity2	-0.26	0.20	0.10	0.08	0.22	1.00			
INF	-0.08	-0.07	-0.29	-0.30	-0.10	-0.04	1.00		
GOV	-0.38	0.08	-0.17	-0.30	-0.10	0.36	-0.09	1.00	
SEC	-0.22	0.33	0.19	0.08	0.11	0.53	-0.22	0.36	1.00

(c) Panel Data Emerging Countries

	Δ(Y)	ln(Y)	FO	FD	TO	Polity2	INF	GOV	SEC
Δ(Y)	1.00								
ln(Y)	0.03	1.00							
FO	0.10	-0.13	1.00						
FD	0.07	-0.29	0.52	1.00					
TO	0.08	-0.14	0.81	0.66	1.00				
Polity2	-0.12	0.05	-0.02	-0.14	0.01	1.00			
INF	-0.19	-0.05	-0.06	-0.12	-0.06	0.06	1.00		
GOV	-0.03	-0.26	0.00	0.29	0.27	0.11	-0.04	1.00	
SEC	-0.03	0.03	0.26	0.29	0.43	0.08	-0.02	0.40	1.00

(d) Panel Data Other Developing Countries

	Δ(Y)	ln(Y)	FO	FD	TO	Polity2	INF	GOV	SEC
Δ(Y)	1.00								
ln(Y)	0.01	1.00							
FO	0.06	-0.02	1.00						
FD	-0.07	-0.04	0.24	1.00					
TO	0.09	-0.07	0.56	0.34	1.00				
Polity2	0.00	-0.11	0.33	0.16	0.41	1.00			
INF	-0.08	-0.06	-0.16	-0.14	-0.09	0.03	1.00		
GOV	-0.12	-0.04	0.14	0.31	0.30	-0.13	-0.05	1.00	
SEC	-0.03	-0.16	0.44	0.59	0.39	0.52	0.16	-0.02	1.00

Table.3. *continues*

(e) Panel Data Eastern Europe Countries

	Δ(Y)	ln(Y)	FO	FD	TO	Polity2	INF	GOV	SEC
Δ(Y)	1.00								
ln(Y)	0.02	1.00							
FO	0.34	0.16	1.00						
FD	0.11	0.30	0.38	1.00					
TO	0.11	-0.27	0.62	0.21	1.00				
Polity2	-0.01	-0.33	0.37	0.10	-0.11	1.00			
INF	-0.42	-0.07	-0.21	-0.11	0.43	-0.11	1.00		
GOV	-0.07	-0.36	0.00	-0.17	0.68	0.43	0.09	1.00	
SEC	-0.55	0.90	0.92	-0.17	0.63	0.75	0.66	0.58	1.00

Mainly, the data shows that the magnitude of the direct linear relationship between growth and finanial openness is small, yet the largest appears for eastern Europe countries. Similar finding holds for financial development and growth, even the linear association seems to be negative for other developing countries. Even, these simple statistics display that the behaviour of the relationship varies immediately as the group of countries change.

3.4.2. Evolution of Financial Openness and Financial Development

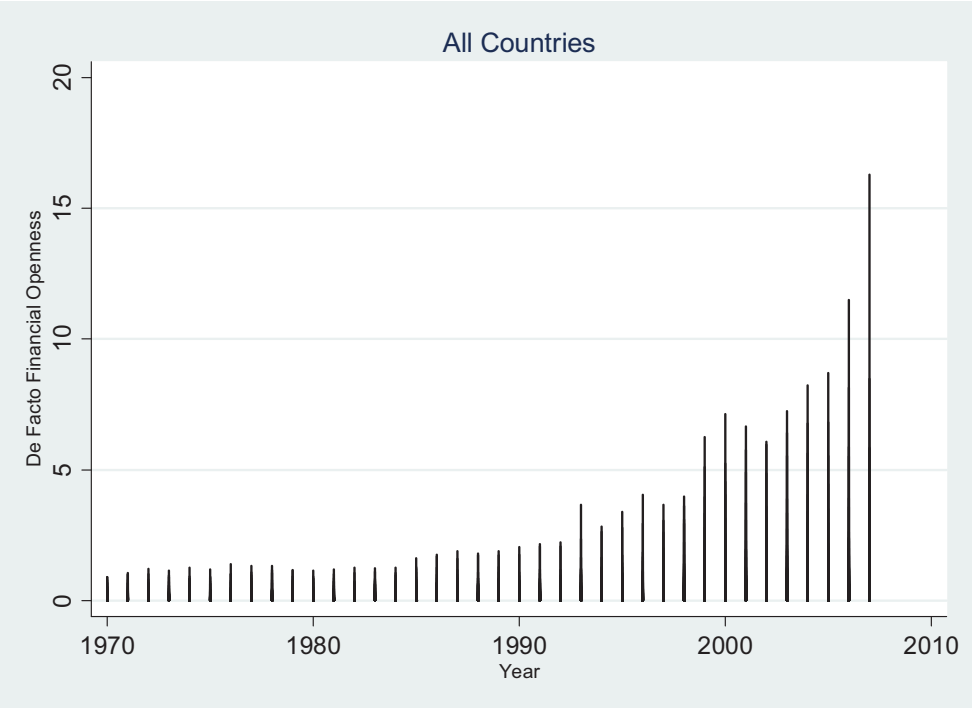
After summarizing the basic descriptives of the data, this study will move on with the depiction of the data through graphical representations covering the dependent and the independent variables.

Figure.1 shows the changes in the financial openness measure through the years in the overall for all countries and for each country group. The time period is 1970-2007 and the *de facto* financial openness measure is the one which is constructed based on the study of Lane and Milesi-Ferretti (2003), and Lane and Milesi-Ferretti (2007). As it is seen in panel (a) of Figure.1, there exists an absolute increase in international financial integration especially by mid-1980s[19].

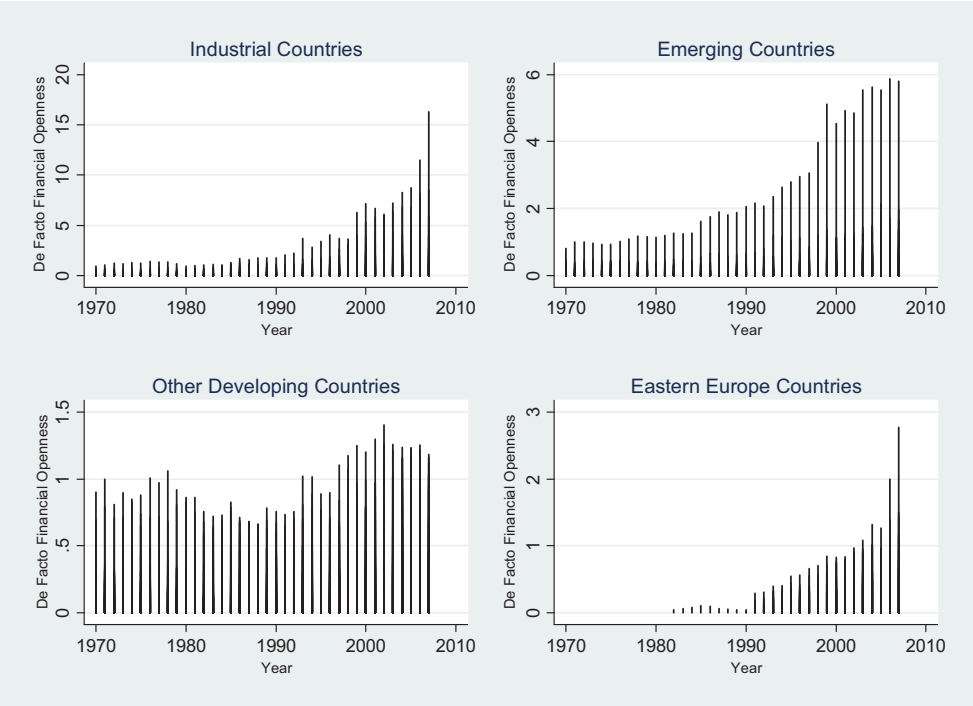
[19] A much earlier wave of financial globalization, which took place between 1880 and 1914, has been analyzed by Bordo, Taylor, and Williamson (2003), Obstfeld and Taylor (2004), and Mauro, Sussman, and Yafeh (2006).

Figure.1. Financial Openness Through Time

(a) All Countries



(b) Country Groups



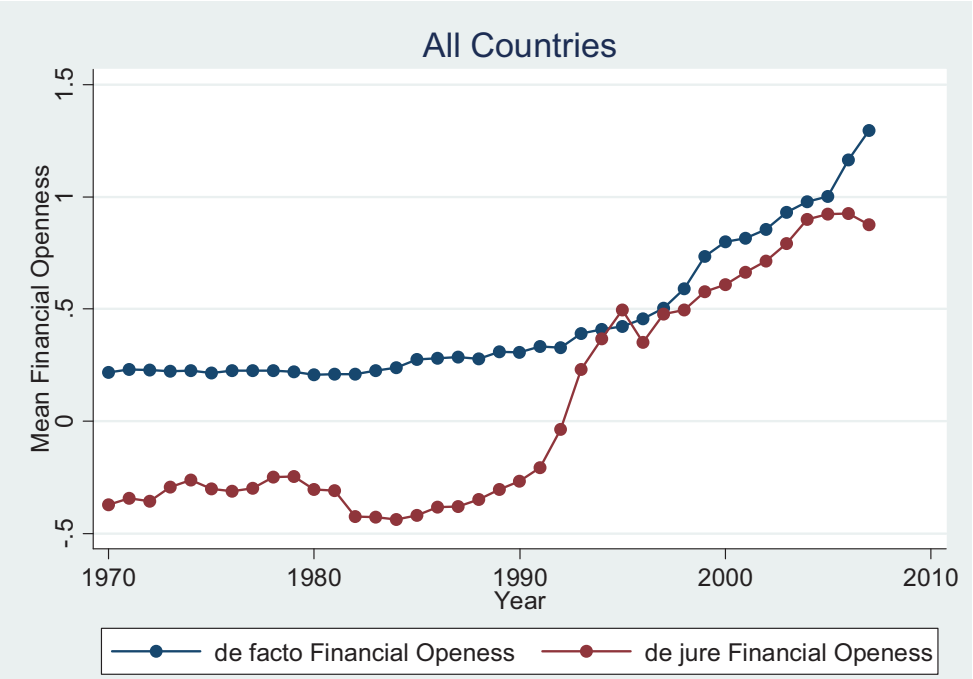
Panel (b) of Figure.1 presents and compares the level of financial integration according to the level of development of the economy. It is clear that the level of financial openness is highest for the advanced economies while the lowest values come up in other developing countries. Emerging economies seems to gain speed in financial openness especially after 1980s and the larger integration seems to take place through 2000s. Still, the sample of emerging countries couldn't achieve to reach the level that the group of industrial countries achieved. The minimum levels of financial openness are seen in other developing countries and east European countries, especially the group of ODCs can not be able to make it above 1.5.

Figure.2 depicts how financial integration has evolved over time for different levels of development of the economy based on the *de jure* and *de facto* financial openness measures using simple averages within whole sample and within each group of countries. The time period of analysis is 1970-2007. The *de jure* measure is based on Chinn-Ito index taken from Chinn-Ito (2006) while the *de facto* measure, FO, is based on the on the study of Lane and Milesi-Ferretti (2003), and Lane and Milesi-Ferretti (2007).

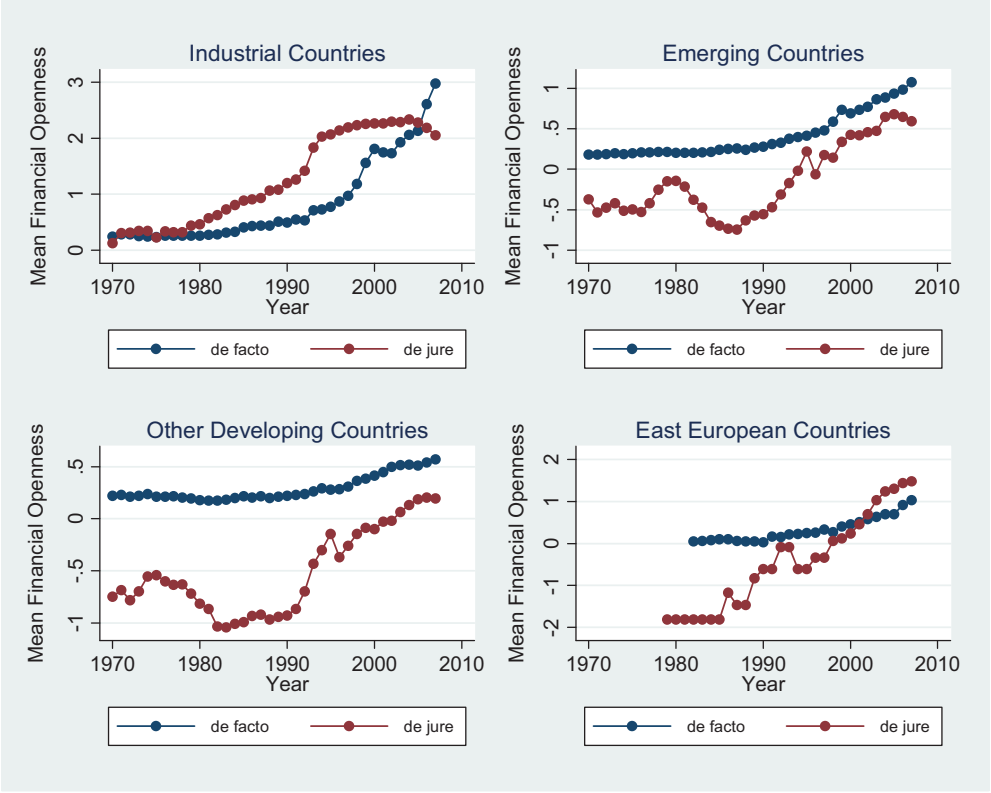
Both measures show that advanced economies have been integrated into global markets largely, especially in the 1990s they have achieved an enormous increase in financial openness. Here *de jure* openness tend to low down after 2000 while *de facto* openness maintains the increase. For emerging market economies, it differs between *de jure* and *de facto* measures. The average *de jure* openness increases through time yet it shows a lot of ups and downs while *de facto* openness FO has consistently increased and more stabile. The emerging countries have had a modest increase during 1980s but more of a sharp rise in the 1990s. For other developing economies, both *de jure* and *de facto* openness show increase especially over the last decade, still *de facto* openness display a larger global financial integration and captures the timid increase in openness. Yet, the level of financial openness is still the lowest for this group of countries. Old eastern block countries also display increasing integration especially after

Figure.2. Evolution of International Financial Integration

(a) All Countries



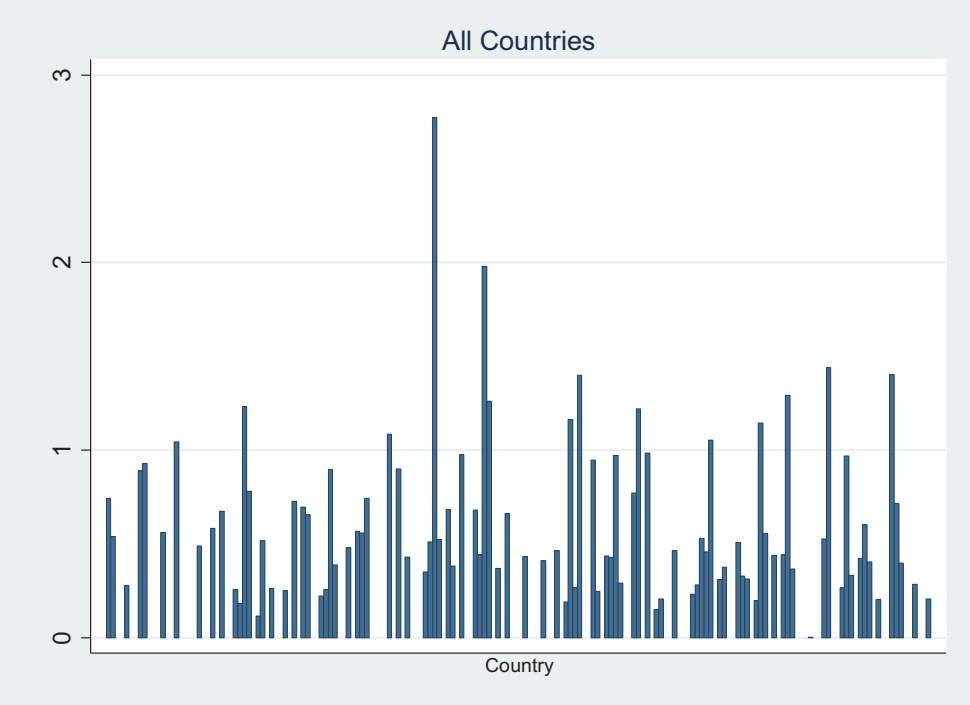
(b) Country Groups



1990s. Figure.2 highlights the different informational content in two different types of openness measures and proves that these differences certainly affects the analyses of the relationship between financial globalization and growth.

From the point of financial depth, Figure.3 displays the level of liquid liabilities to GDP in 2007 across countries. The wide cross-country variation is clear with values ranging up above 2 to near 0 since on the one extreme there are financial systems with trillions of dollars in which the ratio to GDP is even enormous and on the other extreme there are small and poor countries with smaller financial systems.

Figure.3. Liquid Liabilities to GDP Across Countries in 2007



Embedding an indicator for the credit allocation side of the financial systems next to the the liability side, Figure.4 graphically combines the levels of liquid liabilities to GDP and private credit by deposit money banks to GDP for each sample group of countries. As it is seen from the figure both financial development measures behave similarly. Both indicators varies

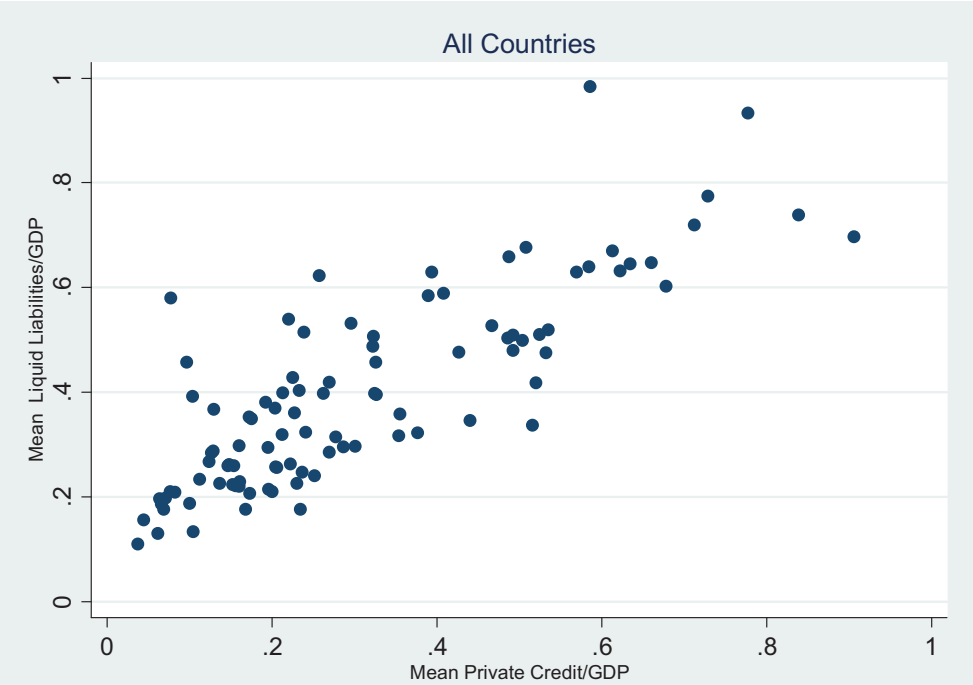
positively with the level of the development of the economy, the larger values show up for industrial countries group while the smaller ones exist in other developing countries group which is heavily dominated by poor and small economies. In addition, both panels of Figure.5. depicts a solid and constant positive association between the two indicators of financial development.

Figure.4. Financial Development Indicators in Means by Country Groups (2007)

The level of financial development proxied by liquid liabilities over GDP shows a constant increase again especially by mid-1980s as can be seen from Figure.6 panel (a). The deepest and most solid financial development arises for advanced economies through time while both emerging and other developing countries show some ups and downs in financial development through the sample period.

Figure.5. Liquid Liabilities to GDP vs. Private Credit to GDP

(a) All Countries



(b) Country Groups

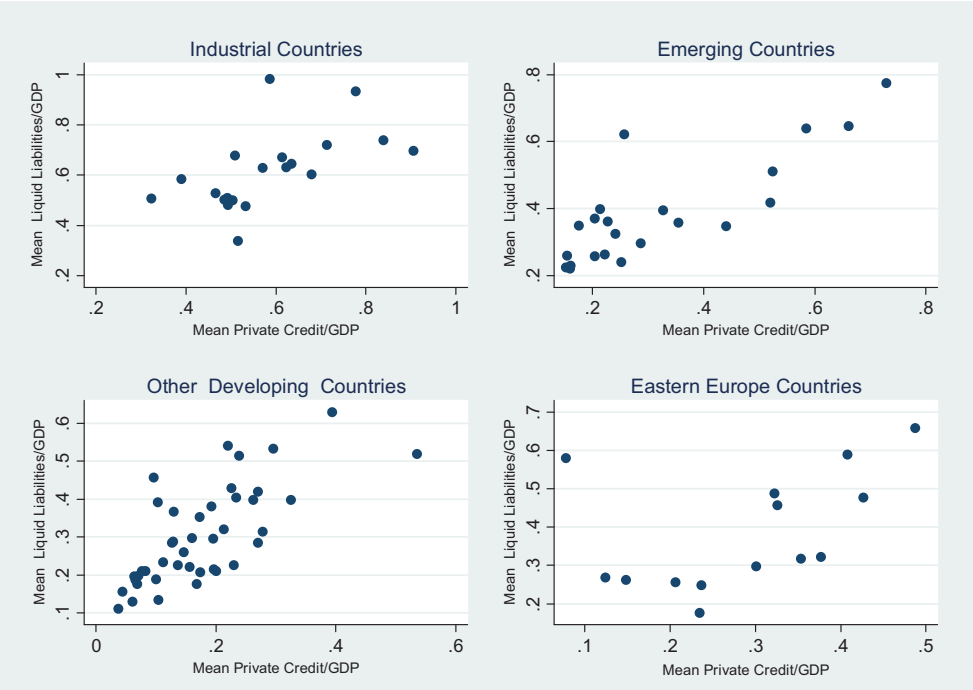
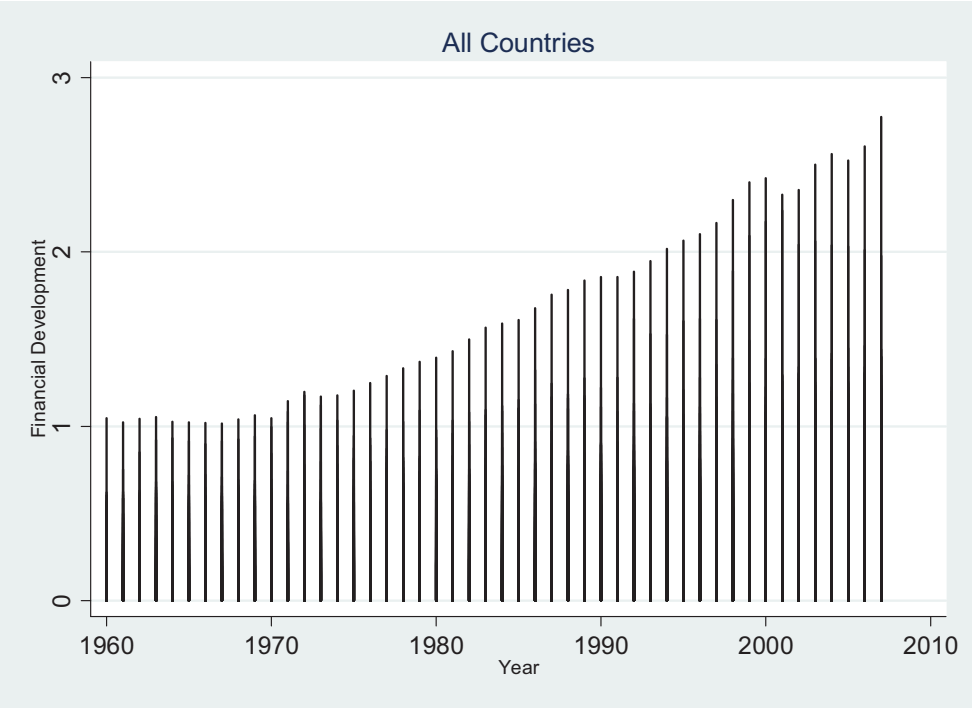
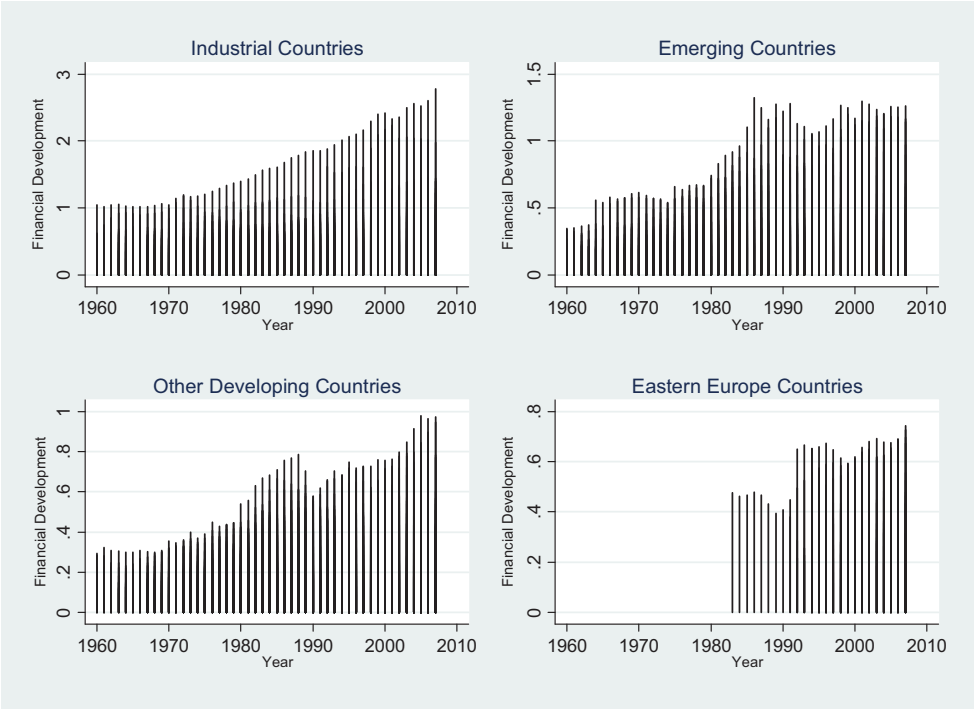


Figure.6. Financial Development Through Time

(a) All Countries



(b) Country Groups



3.5. Synthesis: Financial Openness, Financial Development and Growth

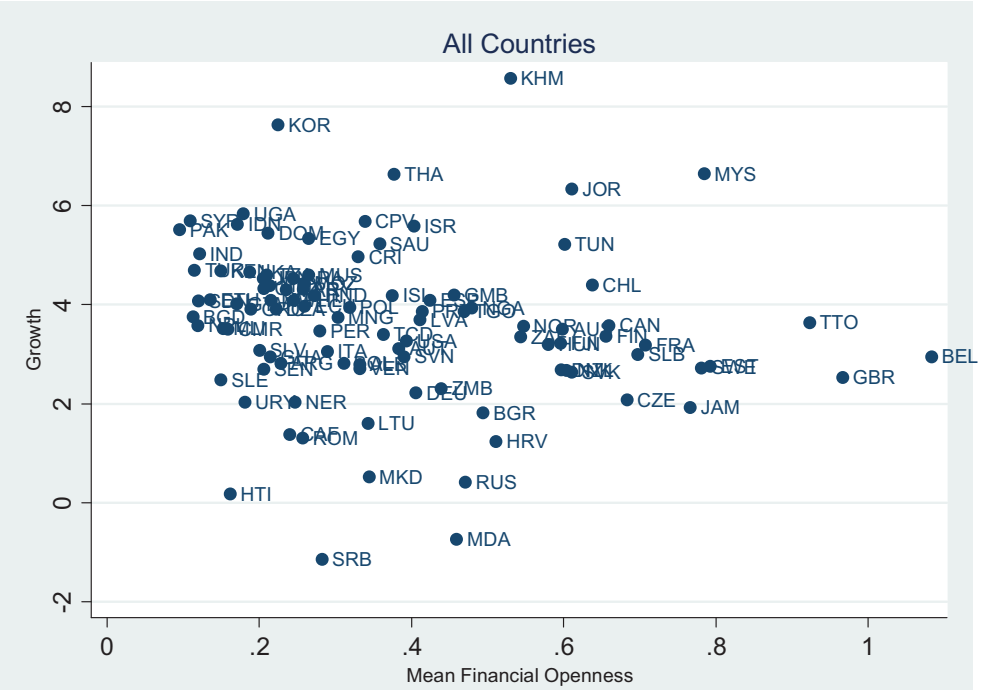
There are a number of severe reasons that may explain why it is so difficult to find a strong and robust relationship between financial integration, financial development and growth although the underlying theory is so strong. Some argue that the literature is looking at the wrong places, some say it is not true to seek for permanent growth effects of financial openness, some claim that the ambiguity is due to the considerable measurement errors in financial integration indicators. All of the oldest and recent arguments on the existing studies to detect a positive relationship between financial openness and growth is covered by Rodrik and Subramanian (2008).

Figure.7 panel (a) further illustrates the relationship between economic growth and financial openness through a scatter plot of the average growth rate of real per capita GDP versus average level of *de facto* financial openness, FO, across countries through 1970 to 2007. As is obvious from the plot there exists no apparent relationship between the two variables when all countries in the data set are considered. This picture is a simple evidence to the inconclusive findings in the literature on growth-finance nexus. Panel (b) of Figure.7 pictures the relationship between growth and financial integration according to the level of economic development, again the figures indicate no or at most mixed effects especially for emerging and other developing countries. The most clear positive relationship between financial openness and growth exists for the sample group of eastern Europe countries.

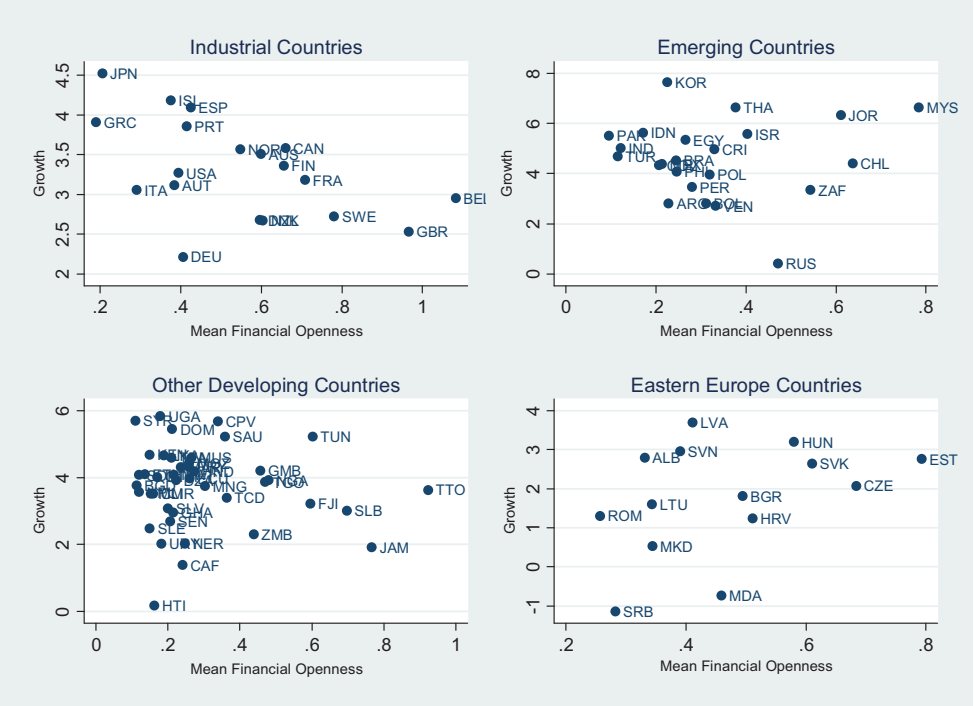
Subsequently, a scatter plot between growth and the level of financial development for the overall sample is presented in panel (a) of Figure.8. We may speak of a positive yet slight relationship between financial development and growth since higher levels of financial development seems to be associated with higher rates of growth while vice versa holds too. A more apparent positive relationship between the two is seen for industrial countries and emerging countries from panel (b) of Figure.8. Though, the relationship is not clear for other developing countries. Similarly, the figure is not indicating an exact linear relationship for eastern Europe countries either.

Figure.7. Level of Financial Openness and GDP Growth (1960-2007)

(a) All Countries



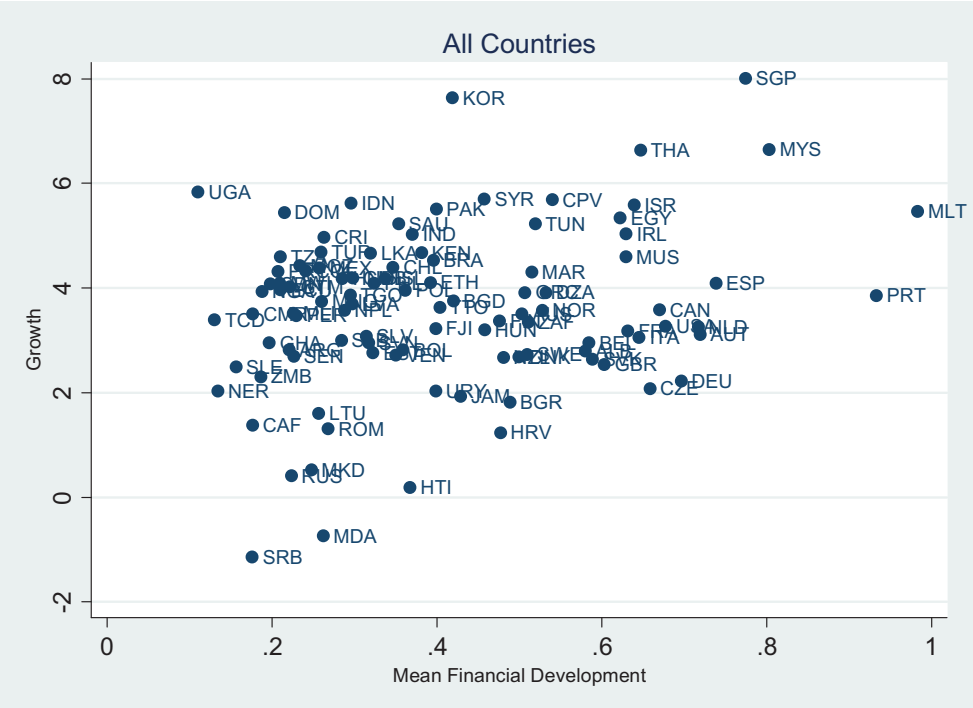
(b) Country Groups



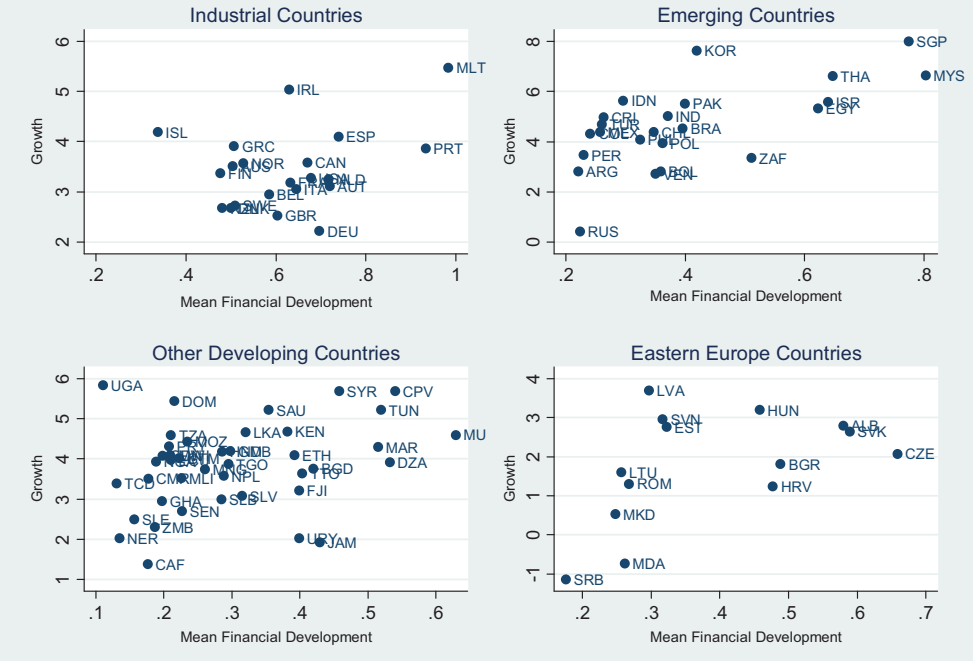
Notes: Growth refers to the average real per capita GDP growth. Mean Financial Openness is the average of the *de facto* financial openness measure FO. The graphics exclude Hong Kong, Singapore, Ireland, Malta, Switzerland and Netherlands which have very high levels of financial globalization.

Figure.8. Level of Financial Development and GDP Growth (1960-2007)

(a) All Countries



(b) Country Groups



Note s: Growth refers to the average real per capita GDP growth. Mean Financial Development is the average of ratio of liquid liabilities to GDP constructed by Beck and Demirgüç-Kunt (2004). The graphics exclude Hong Kong, Japan, Switzerland and Netherlands which have very high levels of development and Cameroon which has extremely low financial development level.

In this study, the effects of financial openness and financial development on growth is also investigated indirectly: through the institutional development channel. Recent empirical research provides some evidence that in order to derive positive growth benefits from financial openness and/or financial development, a certain level of institutional quality is a prerequisite. Here using the *polity2* variable to proxy for the level of institutional development, Figure.9 indicates that there could be a positive link between financial openness and institutional development for emerging countries and other developing countries. It wouldn't be reasonable to talk of such a link for industrial countries since nearly all of them achive top ranking institutional quality, while the link between the two seems unclear for the eastern European countries.

Figure.9. Financial Openness and Institutional Development

Notes: Institutional Development refers to the average *polity2* variable. Mean Financial Openness is the average of the *de facto* financial openness measure FO. The graphics exclude Hong Kong, Japan, Switzerland and Netherlands and Cameroon which are outliers.

Similar arguments hold for the financial development and institutional development linkage, too. As can be seen in Figure.10, a slight but positive

relationship between financial and institutional development exists both in emerging and other developing countries. On the contrary, there seems no such association between the two for industrial and eastern Europe countries.

Figure.10. Financial Development and Institutional Development

Notes: Institutional Development refers to the average *polity2* variable. Mean Financial Development is the average of ratio of liquid liabilities to GDP constructed by Beck and Demirgüç-Kunt (2004). The graphics exclude Hong Kong, Japan, Switzerland and Netherlands and Cameroon which are outliers.

To sum up, the illustrative analyses so far summarize that there is no robust empirical evidence indicating that financial openness fosters growth through direct channels and they verify the weakness of the macro evidence in favor of financial integration[20]. On the other hand, although these facts and figures are insufficient to derive exact conclusions, the collateral growth benefits of financial openness from an indirect channel such as the level of institutional development seems to exist especially for emerging and for other developing countries.

[20] See Rodrik and Subramanian (2008) for a skeptical review of the literature on direct and indirect channels.

When the whole sample is considered, both financial openness and financial development tend to increase through time yet financial development displays more variability especially for other developing countries. The numbers and figures indicate a positive association between financial development and growth for emerging countries which can be thought of a clue that emerging countries should financially develop in order to derive growth benefits.

CHAPTER IV

THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT, FINANCIAL OPENNESS AND GROWTH: EMPIRICAL EVIDENCE

In this part of the study we investigate the relationships between finance (financial development and financial openness) and growth for a panel of industrial and developing countries. We also investigate if this relationship changes with the level of governance. The use of panel data allows us to take the advantage of time series variability in the sample along with the cross-sectional variability.

This study contributes to the ongoing literature by taking institutional quality embedded in political regime characteristic into consideration next to the traditional growth determinants. A newly evolving literature suggests that rather than direct effects, there may exist indirect effects of financial openness and financial development on growth such that a country needs to reach a certain level of institutional development before it can receive growth benefits from both. The traditional aggregate indicators of six dimensions of governance - namely Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption - are constructed by Kaufman (2008, with first version in 2002) in World Governance Indicators (WGI) dataset and measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. As Kaufman stated, "*The governance indicators reflect the statistical compilation of responses on the quality of governance given by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries, as reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations, and subject to margins of error*". However, the problem with this data set is that it starts from 1996 which is insufficient for the time period covered in this study, moreover, it has missing values even in this very short time line. To this end, we prefer to use another variable instead, which is a broader and a more available

one, namely *polity2*. Yet, it should be noted that the empirical results of the study are repeated for 1996 and later also using the six traditional governance indicators mentioned above (see Appendix D), and the findings are consistent with the ones using *polity2* variable[21]. Recall the *polity2* variable from Polity IV database (Marshall and Jaggers, 2002) mentioned in the previous chapters, this variable is designed to represent a country's institutionalized regime characteristic. Since the direct but frequently missing measures of institutional quality such as rule of law, corruption, government effectiveness and transparency are obviously parts of the political regime characteristic, it would be suitable to use *polity2* variable to proxy for institutional quality along with the degree of democracy (Cavallo and Cavallo, 2010). As noted by Persson and Tabellini (2008), the threshold of 0 for *polity2* corresponds to a generous definition of democracy. Following their work, we define *polity2=0* as the threshold variable and interpret positive values of *polity2* as an indicator of democracy and better institutional quality (institutionally developed) and the negative values of *polity2* as to stand for lower institutional development (institutionally underdeveloped).

We start with the estimation of a generic equation which contains financial position variables along with the conventional variables postulated by the growth literature. An implicit representation of the econometric model can be written as follows

$$y_{it} = f(FO, FD, TO, GOV, INF, SEC) \quad (1)$$

where y is the logarithm of real per capita GDP, FO is financial openness measured by net liabilities plus net assets divided by GDP, FD is the measure of financial development proxied by the ratio of liquid liabilities over GDP, TO is the measure of trade openness proxied by the ratio of total exports and imports over GDP, GOV and INF are the government consumption and inflation rate respectively, and SEC, as to control for the level of human capital, is the percentile average of the secondary school enrollment in the population aged 25 and over. Here note that the level of log real per capita GDP is used as the dependent variable rather

[21] By making use of WGI dataset, a variable is constructed based on yearly averages of the six governance indicators to proxy for overall institutional quality of each country which is only available for 1996 and later.

than growth rate which is standard in the previous literature due to the fact that a standard regresion estimation wouldn't be appropriate with I(0) and I(1) variables entering to the model simultaneously.

This chapter employs three econometric methods that is used to assess the relationship between finance and economic growth. Next to the overall sample, all panel regressions are estimated for four sub-samples which are created according to the countries' level of economic development. These sub-samples are comprised of industrial countries, emerging countries, other developing countries and eastern European countries. A list of countries for each group is available in Appendix B.

The chapter is organized as follows. The first section employs an unbalanced panel data fixed effects estimation. The annual data are averaged over five-year non-overlapping intervals in order to focus on longer-run rather than higher frequency relationships. The second section outlines the panel autoregressive distributed lag (ARDL) methodology which allows for heterogeneity in coefficients. Making use of panel unit root (Im *et al*. 2003) and panel cointegration tests (Pedroni, 1999), the panel ARDL model is used to investigate the long-run structure and short-run dynamics of the finance-growth relationship for the overall sample and for the sub-samples. In the third section, panel ARDL methodology is re-performed according to the level of income rather than the level of economic development. In the fourth section, a dynamic generalized method of moments (GMM) procedure is applied due to Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). This dynamic panel procedure is advantageous since it controls for potential endogeneity of regressors and is free from biases. The fifth and final section summarizes the overall results together enabling a smooth comparison.

4.1. Panel Data Fixed Effects Estimation

In this section, the effects of financial development and financial openness on economic growth is investigated using an unbalanced panel data set of 105 countries over the period 1960 (if available) to 2007. In static

panel data models, pooled OLS, fixed effects (FE) and random effects (RE) are used. Here random effects (RE) are excluded since the Hausman (1981) test rejects the null hypothesis in favor of fixed effects over random effects, therefore the regression parameters are estimated using fixed effects.

For each of the countries, the underlying annual data are averaged over 5-year intervals through 1960-2004 and 3-year intervals through 2005-2007 with at most 9 non-overlapping five year periods and 1 non-overlapping three year period. In the finance-growth literature, the time averaging of the data over five or more years is preferred rather than using annual data in order to smooth out transitory or business-cycle fluctuations and to capture the long-run steady state relationship between the variables (Beck *et al.*,2000; Levine *et al.*, 2000; Beck, 2008; Bekaert *et al.*, 2009).

Our baseline equation with fixed effects which contains financial position variables along with the conventional variables takes the following form

$$y_{it}=\beta_0+\alpha y_{i,t-1}+\beta_1 FO_{it}+\beta_2 FD_{it}+\beta_3^{'} X_{it}+\eta_i+\varepsilon_{it} \qquad (2)$$

In (2), η_i is the unobserved time-invariant specific effects and ε_{it} is the independently and identically distributed Gaussian disturbance term with 0-mean and finite positive variance. The initial income per capita is the log of real per capita GDP in the first year of the respective time period which is reset at 5-year intervals (Bekaert *et al.*, 2008). It is used to capture the convergence effect and is expected to be negative in the conventional growth regressions[22]. The trade openness measure which is denoted by TO is expected to have an enhancing influence on growth, and the government consumption and inflation which are denoted by GOV and INF respectively both are expected to have negative effects on growth.

[22] As it is standard in the conventional growth regressions such as $\Delta X_t=\beta X_{t-1}+\delta^{'} Z+u_t$ where Z_t is the vector of variables associated with growth, the conditional convergence coefficient β is expected to be negative due to the tendency for growth rates to converge. This standard growth regression equation can be reparametrized as $X_t=\varphi X_{t-1}+\delta^{'} Z+u_t$ with $\varphi=1+\beta$. Therefore, an estimate of $\varphi<1$ is consistent with the convergence condition.

To assess the impact of financial development and financial openness on growth, and to assess whether this relationship, if exists, depends on the level of economic development and level of institutional development, the basic panel data model given by (2) will be estimated repeatedly for overall sample (ALL), the industrial countries sample (IND), the emerging countries sample (EMG), the other developing countries sample (ODC) and the eastern Europe countries sample (EE) in turn. Each estimation for each group of sample will be performed both for institutionally underdeveloped and institutionally developed countries, in other words countries who are below or above the predefined threshold variable *polity2=0*.

Sample Group 1: All Countries

The panel data regression given by equation (1) is estimated through panel fixed effects technique for the whole data set considering both the institutionally underdeveloped group of countries and the institutionally developed ones. For each category, the columns labeled with **(I)** stands for the initial estimation and **(II)** stands for the final estimation released from insignificant variables.

In Table.4, panel fixed effects estimation results are displayed with respect to the "institutional development" level. The results clearly indicate a positive and significant relationship between financial development and economic growth regardless of the level of institutional development, either being below or above the predetermined threshold level of 0. In other words, when all countries are considered in the estimation process, our results are in favor of the supply-leading view. However, the level of the institutional development makes significant difference from the point of financial openness. As it is seen from Table.4, financial openness seems to have no effect on growth for institutionally underdeveloped countries, yet it turns out to be positive and significant as soon as institutional development exceeds the threshold level 0. These results indicate that countries should achieve higher than threshold value of institutional development in order to derive growth benefits from financial openness, hence financial openness promotes economic growth through an indirect channel. Moreover, trade

openness and the level of human capital accelerate growth also regardless of the level of institutional development.

Table.4. Fixed Effects Estimation Using Whole Sample (ALL)

	Institutionally Underdeveloped		**Institutionally Developed**	
	(I)	**(II)**	**(I)**	**(II)**
FO	-0.0313 [0.17989]		0.0275* [0.01349]	0.0985* [0.03018]
FD	0.4948* [0.22525]	1.0710* [0.25656]	0.3150* [0.04494]	0.7159* [0.09589]
TO	0.3107 [0.21696]	0.9190* [0.23535]	0.3075* [0.04885]	0.7851* [0.10313]
GOV	-0.0287* [0.00870]	-0.0167** [0.00928]	0.0013 [0.00236]	
INF	-0.2146 [0.15178]		-0.0020 [0.00317]	
SEC	0.0537* [0.00522]	0.0459* [0.00436]	0.00675* [0.00087]	0.0120* [0.00189]
Constant	25.5586* [0.24258]	24.6493* [0.23082]	11.0073* [0.06324]	25.3007* [0.11652]
Log Initial Income	-0.0109** [0.00626]	0.0003** [0.00688]	-0.0029** [0.00173]	-0.0032 [0.00380]
N **NxT**	**37** **124**	**39** **156**	**69** **336**	**71** **346**
Adj-R^2	**0.77**	**0.77**	**0.60**	**0.61**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively.

Sample Group 2: Industrial Countries

Secondly, the panel data model is estimated through fixed effects using the sample of advanced economies. A vast majority of the countries in this group are institutionally developed with strong, stable and high quality institutions so that the number of observations to carry out a regression estimation for the institutionally underdeveloped ones are insufficient. To this reason, in this group of industrial countries, the panel data estimation is performed using all countries in the sample without dividing them into two seperate categories as institutionally underdeveloped or well-developed.

Table.5 displays the results of fixed effects estimation in which it is seen that for industrial countries there exists a positive and significant relationship between financial development and growth. Similarly trade openness, government consumption and the level of educational attainment have positive and significant impact on growth. Though it is significant, the coefficient estimate of financial openness is too small which is meaningful since nearly all of the industrial countries have already been largely integrated to the global markets, hence a unit increase in financial openness lose its significance on promoting growth. Summarizingly, for industrial countries, these results verify the Schumpeterian view that financial development can promote economic growth.

Table.5. Fixed Effects Estimation For The Sample of Industrial Countries

	(I)
FO	0.0660* [0.03280]
FD	0.3809* [0.09937]
TO	0.7032* [0.20811]
GOV	0.0310* [0.00902]
INF	-1.0875* [0.26073]
SEC	0.0037** [0.00210]
Constant	25.6248* [0.21972]
Log Initial Income	0.0017 [0.00660]
N	**23**
NxT	**149**
Adj-R^2	**0.72**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively.

Sample Group 2: Emerging Countries

One of the important sample of countries in this study is the group of emerging economies. Although the literature still stays inconclusive about the direct positive effects of financial integration on the economic growth of emerging countries, these countries continuously increase their financial openness. Moreover, it is important to figure out if and how financial development shapes the economic progress in emerging economies.

The basic panel data regression is estimated using fixed effects with respect to institutionally underdeveloped and institutionally developed emerging economies respectively and the results for each are presented in Table.6.

Table.6. Fixed Effects Estimation For The Sample of Emerging Countries

	Institutionally Underdeveloped		**Institutionally Developed**	
	(I)	**(II)**	**(I)**	**(II)**
FO	0.0801 [0.28399]	0.3589* [0.08064]	0.7076* [0.21499]	0.6763* [0.17838]
FD	0.5560 [0.96056]	0.8603** [0.46627]	0.5948* [0.23182]	0.5838* [0.21553]
TO	-0.4783 [0.85143]		0.3192 [0.19745]	0.3494** [0.18431]
GOV	-0.0018 [0.05892]		0.0067 [0.01199]	
INF	-0.3403 [0.44055]		0.0057 [0.00881]	
SEC	0.0712* [0.01675]	0.0252* [0.00536]	0.0247* [0.00546]	0.0249* [0.00512]
Constant	24.2614* [1.66721]	23.5923* [0.53734]	26.0560* [0.26378]	26.2285* [0.21383]
Log Initial Income	0.0055 [0.01993]	0.0088 [0.01744]	-0.0043 [0.00726]	-0.0050 [0.00673]
N **NxT**	**6** **17**	**7** **26**	**16** **83**	**17** **87**
Adj-R^2	**0.94**	**0.89**	**0.76**	**0.77**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively.

Both financial openness and financial development are found to have positive significant growth effects even when the emerging countries are institutionally underdeveloped. Similar conclusion held for institutionally developed countries, too, but with a coefficient estimate approximately twice larger than the other such that a unit increase in financial openness fosters growth by approximately 70%. Thus, for emerging countries financial openness and financial development accelerates growth regardless of the level of institutional development, however, the amount of growth benefits from financial openness doubles up when institutional development surpasses the threshold. The government consumption and rate of inflation have no significant effect while

the ratio of secondary school enrollment has positive and significant effect on growth for emerging countries again no matter what the level of institutional development is. On the other hand, emerging countries which are institutionally developed are able to derive positive and significant benefits from international trade openness, while institutionally underdeveloped ones couldn't do so.

Our results seem to take side of the notion that better developed financial markets and further financial openness spurs long-run economic growth in emerging countries no matter what the level of institutional development is.

Sample Group 3: Other Developing Countries

One other largest sample of countries in this study is the group of other developing countries as listed in Appendix B. A great number of these countries suffer from underdeveloped institutions, ill political regimes and instable governance. The fixed effects estimation results to the panel regression model given in (2) is provided in Table.7 again comparing the institutionally underdeveloped and the developed ones.

The results point out to a very important conslusion: there is significant difference between institutionally underdeveloped and institutionally developed ODCs such that neither financial openness nor financial development have a long-term relationship with growth when the level of institutional development is lower than the threshold, while they both have positive significant effects when countries do have higher than threshold institutional development. Clearly, in order to receive growth benefits from financial integration and financial development, other developing countries must ameliorate their institutional development in the first place.

The trade openness, on the other hand, do have positive and significant effect on growth whichever the degree of institutional development is. The negative effect of government consumption also disappears when the level of institutional development is up above the threshold.

Table.7. Fixed Effects Estimation For The Sample of Other Developing Countries

	Institutionally Underdeveloped		**Institutionally Developed**	
	(I)	**(II)**	**(I)**	**(II)**
FO	0.0714 [0.28230]		0.6327* [0.21778]	0.7114* [0.14494]
FD	-0.1639 [0.40543]		0.6289 [0.41523]	0.8224* [0.25236]
TO	0.4416** [0.25066]	1.1374* [0.22697]	0.6145* [0.23375]	0.7961* [0.16465]
GOV	-0.0251* [0.01027]	-0.0195* [0.00902]	-0.0010 [0.00707]	
INF	-0.0934 [0.19715]		0.0888 [0.18883]	
SEC	0.0645* [0. 00849]	0.0534* [0.00454]	0.0088 [0.00547]	
Constant	25.0423* [0.27793]	24.3084* [0.22132]	23.5623* [0.24108]	23.9349* [0.15530]
Log Initial Income	-0.0131 [0.00806]	0.0028 [0.00740]	0.0016 [0.00636]	-0.0041 [0.00462]
N **NxT**	**25** **89**	**27** **142**	**25** **90**	**32** **134**
Adj-R^2	**0.72**	**0.66**	**0.59**	**0.63**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively.

Sample Group 4: Eastern European Countries

The group of eastern Europe countries is the smallest sample in the study. Most of them are small economies, mainly remainings of old eastern block and do lack of data before 90s. The secondary school enrollment variable (SEC) is removed from the general model given by (1) for this sample group of countries, since the data does not exist or at most insufficient to carry out an estimation. Rest of the interest and control variables remain the same. Besides, due to the fact that there exists only three institutionally underdeveloped countries in this sample, the fixed effects estimation is performed using the whole sample of EE countries without distingusihing them as institutionally underdeveloped or well developed.

Table.8. displays the estimated coefficients and standard errors. As it is seen, both financial openness and financial development spurs growth in

eastern European economies. Especially financial development measure has the largest estimate which indicates that eastern European countries favor the most from financial depth. The trade openness seem to have no significant effect on growth while government consumption has quite small negative effect on long-term development.

Table.8. Fixed Effects Estimation For The Sample of Eastern Europe Countries

	(I)	**(II)**
FO	0.1210 [0.09635]	0.2376* [0.05266]
FD	0.9940* [0.23441]	0.9454* [0.22210]
TO	0.2183 [0.18109]	
GOV	-0.0197** [0.01043]	-0.0179* [0.00912]
INF	-0.0350 [0.03454]	
SEC	-	-
Constant	25.5456* [0.33744]	25.7304* [0.21110]
Log Initial Income	-0.0014 [0.00360]	-0.0032* [0.00347]
N **NxT**	**14** **52**	**14** **52**
Adj-R^2	**0.78**	**0.76**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively.

In sum, using panel data fixed effects estimation procedure, the data tells us that the level of institutional development is important in order to be able to efficiently benefit from financial openness and financial development.

When whole sample is considered, it is seen that financial openness curtails the economic growth when a country is institutionally underdeveloped. This may also further analyzed in a fragility framework, since financially opening of a country without strengthening the institutions and stabilizing the regime seems to induce negative effect on growth. On the other hand, financial integration do increase growth in institutionally developed countries, so countries should first of all reach or exceed a

certain threshold of institutional development in order financial openness to spur growth. When the level of the devolopment of the economy is considered, it is seen that financial openness does not have significant effect on growth for industrial countries which is not surprising since advanced economies as the pioneers of globalization are in fact already integrated into the financial markets. However, the growth effects of financial openness is significant and variant for emerging and other developing economies. First of all, the level of institutional development matters in financial openness-growth relationship for those two sample. For emerging countries, financial openness accelarates growth no matter what the level of institutional development is, but the magnitude of this positive effect increases when a country is institutionally well developed. For the institutionally underdeveloped other developing countries, financial integration has no effect on growth, but we see that financial openness measure become positive and significant as soon as the institutional development surpasses the threshold level.

Financial development is also found to have positive and significant growth effect regardless of the institutional development level when the overall sample is investigated. Still, the institutionally developed countries gain more growth benefits from financial development than the underdeveloped ones. Financial development is not significant for growth process at all for the institutionally underdeveloped ODCs, but positive, significant and second largest in value compared to other groups for institutionally developed countries. These findings here, hence, support the idea that financial development spurs growth through indirect channels such as institutional development for developing economies.

4.2. Short- and Long-Run Growth Effects of Financial Development and Financial Openness: Panel Autoregressive Distributed Lag Approach

The traditional method of time-averaging in fact veils the dynamic relationship between the variables of the system, eliminates the useful opposite effects at different time frequencies or may yield to spurious contemporaneous correlations even though the original series are not

contemporaneously correlated. Moreover, averaging induces a loss of precision and information, especially information which can be used to estimate alternative models allowing for parameter heterogeneity.

In this section, instead of time averaging the data, the short- and long-run effects of financial openness and financial development on growth is studied on annual data using a a panel error correction model in which long- and short-run effects are estimated jointly from a general autoregressive distributed-lag (ARDL) model.

As a general method, cointegration techniques following Engle and Granger (1987); Johansen (1991); Phillips (1991); Phillips and Hansen (1990); and Phillips and Loretan (1991) are used to estimate long-run relationships between variables integrated of order one, so-called I(1) variables. The basic premise of cointegration literature is that long-run relationships exist only between the cointegrated variables and traditional regression estimation approach is no longer applicable. Pesaran and Smith (1995) and Pesaran and Shin (1999) have re-examined the use of the traditional ARDL approach for the analysis of long run relations and showed that slight modifications to standard methods render consistent and efficient estimators of the parameters in a long-run relationship between both integrated and stationary variables.

One very prominent feature of autoregressive distributed lag (ARDL) approach to long-run modelling, as Pesaran and co-authors has labeled so, is that it is no longer necessary to pre-test for stationarity or confirm order-of-integration of the variables of interest since their methods are valid whether or not the variables of interest are I(0) or I(1) or mutually cointegrated. Another advantage of ARDL method is that estimation is possible when explanatory variables are endogenous. The major prerequisites of this methodology are, first, a long run relationship between the variables of interest must exist and, second, residuals must not be serially correlated.

The general autoregressive distributed lag, ARDL (p,q,r), model with two exogenous explanatory variables (X_t; Z_t) is defined as

$$Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i Y_{t-i} + \sum_{i=1}^{q} \beta_i X_{t-i} + \sum_{i=1}^{r} \delta_i Z_{t-i} + u_t \quad (3)$$

where Y_t is the dependent variable, X_t and Z_t are vectors of explanatory variables and u_t is usually an independently and identically distributed white noise error, though it could also be moving average. As an illustration let us consider the basic ARDL(1,1) model:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \beta_0 X_t + \beta_1 X_{t-1} + u_t \quad (4)$$

where X does not depend on lagged values of Y, otherwise the long-run relationship between the two variables would not be unique (Hsiao, 1997; and Pesaran and Shin, 1999). This ARDL(1,1) model given in (4) can be reparametrized as the Error Correction Model (ECM):

$$\Delta Y_t = a_0 + b_0 \Delta X_t + a_1 Y_{t-1} + b_1 X_{t-1} + u_t \quad (5)$$

where

$$a_0=\alpha_0 ;\ b_0=\beta_0 ;\ a_1=(\alpha_1-1);\ b_1=\beta_0+\beta_1$$

or with an alternative representation adjusted to long-run:

$$\Delta Y_t = \lambda_1 \Delta Y^*_{t-1} + \lambda_2 \Delta(Y^*_{t-1} - Y_{t-1}) + u_t$$

where the long-run equilibrium is

$$Y^*_t = \theta_0 + \theta_X X_t$$

and (λ_1, λ_2) are adjustment coefficients which measure how Y changes in response to changes in the target and how it adjusts to the deviations from the target in order to come back to the equilibrium. The mathematical relation between the estimated and the hypothetical parameter is

$$a_0=\lambda_2 \theta_0 ;\quad a_1=-\lambda_2 ;\quad b_0=\lambda_1 \theta_X ;\quad b_1=\lambda_2 \theta_X$$

When a panel framework is of concern, then the typical ARDL(p,q) model can be extended for both time-series (T) and cross-section (N) dimensions as

$$Y_{it} = \sum_{j=1}^{p} \lambda_{ij} Y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij}' X_{i,t-j} + \mu_i + u_{it} \qquad (6)$$

where X_{it} is a *(kx1)* vector of regressors for group i; μ_i are the fixed effects; λ_{ij} are the scalar coefficients of the lagged dependents variables; and δ_{ij} are *(kx1)* vectors of coefficients given t=1,2,...,T time periods, and i=1,2,....,N groups. Although T and p across groups, and q across groups and regressors may vary, we used a common T,p and q for notational convenience.

The panel ARDL model given by (6) above can also be reparametrized as follows:

$$\Delta Y_{it} = \phi_i Y_{i,t-1} + \beta_i' X_{it} + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta Y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*'} \Delta X_{i,t-j} + \mu_i + u_{it} \qquad (7)$$

where $\phi_i = -(1 - \sum_{j=1}^{p} \lambda_{ij})$; $\beta_i = \sum_{j=0}^{q} \delta_{ij}$; $\lambda_{ij}^{*} = -\sum_{m=j+1}^{p} \lambda_{im}$, j=1,2,...,p-1 ;

and $\delta_{ij}^{*} = -\sum_{m=j+1}^{q} \delta_{im}$, j=1,2,...,q-1

Since the intention of this study is to examine the finance-growth relationship, the panel ARDL and error correction modelling is fully appropriate in order to detect the long run relationship and short-run dynamics between growth, financial openness and financial development.

In a panel data specification, our model of interest given by equation (2) is nested in an ARDL representation as follows

$$y_{it} = \mu_i + \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij}' X_{i,t-j} + u_{it} \quad (8)$$

where y is the logarithm of per capita GDP; X is the set of growth determinants including measure of financial depth (FD), measure of financial openness (FO), trade openness(TO) and control variables such as government consumption (GOV), rate of inflation (INF) and level of educational attainment(SEC); μ_i represent the fixed effects and u_{it} is the independently and identically distributed disturbance term, given i=1,2,...,N where N is number of countries in the sample and $t=1,2,...,T_i$ since number of time variable varies for each cross section.

Reparametrization of the panel ARDL model given by equation (8) as an error correction model (ECM) yields

$$\Delta y_{it} = \mu_i + \phi(y_{i,t-1} - \theta X_{i,t-1}) + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}^{*'} \Delta X_{i,t-j} + u_{it} \quad (9)$$

where Δ is the first difference operator and ϕ is the equilibrium correction parameter which measures the speed of adjustment, Θ is the long-run coefficient, λ_i and δ_i are the country specific short-run coefficients.

Although ARDL specification dispenses the need for unit-root pretesting of the variables since it can be implemented regardless of whether the underlying variables are I(0), I(1), or fractionally integrated (Pesaran and Smith,1995; and Pesaran and Shin, 1999); as an informative step, the results of panel unit root tests for the variables are performed and presented in Table.9.

The first column displays the results of the Im, Pesaran and Shin's (2003) unit root test, abbreviated as IPS; second column displays the results of the Levin, Li and Chu's (2002) unit root test, abbreviated as LLC; and the last column displays the results of the Maddala and Wu (1999) unit root test,

Table.9. Panel Unit Root Tests

Variable	IPS	LLC	MW
y	5.2536 (4) [1.0000]	45.5060 (3) [1.0000]	236.643 (4) [0.1101]
Δy	-33.9372* (3) [0.0000]	-31.5866* (3) [0.0000]	1555.19* (3) [0.0000]
FO	19.5382 (4) [1.0000]	23.9135 (4) [1.0000]	47.9331 (4) [1.0000]
ΔFO	-3.5419* (4) [0.0000]	-29.4213* (4) [0.0000]	1527.54* (3) [0.0000]
FD	4.2952 (4) [1.0000]	5.0603 (4) [1.0000]	181.236 (4) [0.9251]
ΔFD	-8.7435* (4) [0.0000]	-21.8850* (4) [0.0000]	1267.44* (4) [0.0000]
TO	2.8353 (4) [0.9977]	3.9899 (4) [1.0000]	54.2070 (4) [1.0000]
ΔTO	-51.9726* (3) [0.0000]	-53.3439* (4) [0.0000]	24.5973* (3) [0.0000]
GOV	-7.4822* (3) [0.0000]	-3.5754* (2) [0.0002]	374.029* (3) [0.0000]
ΔGOV	-47.3657* (2) [0.0000]	-6.5314* (2) [0.0000]	2197.04* (2) [0.0000]
INF	-22.6663* (5) [0.0000]	-28.8825* (4) [0.0000]	715.939* (3) [0.0000]
ΔINF	-68.1043* (4) [0.0000]	-58.4574* (3) [0.0000]	2671.78* (3) [1.0000]
SEC	-4.4084* (9) [0.0000]	-6.2627* (2) [0.0000]	212.934* (9) [0.0023]
ΔSEC	-22.7146* (9) [0.0000]	-5.6505* (3) [0.0000]	381.018* (3) [0.0000]

Note that; IPS , LLC and MW are the Im, Pesaran and Shin (2003); Levin, Li and Chu (2002); and Maddala and Wu (1999) respectively. Corresponding p-values are given in brackets [.] and lag lengths, chosen by SIC are given in parentheses (.). The (*) denotes the rejection of unit root at the 5% level.

abbreviated as MW. All tests show that levels of log real GDP, financial openness, financial development and trade openness measures are I(1) while

government consumption, inflation and percentage of secondary school enrollment are I(0). Taking first differences yields all variables to be I(0). The unit root results also verified us that ARDL approach is one of the best alternatives to investigate the long-run relationship and short-run dynamics between our variables of interest.

Hereafter, this long- and short-run models given by (8) and (9) will be estimated seperately for overall sample (ALL) and each of the distinct samples representing the level of development of the economy: the industrial countries sample (IND), the emerging countries sample (EMG), the other developing countries sample (ODC) and the eastern Europe countries sample (EE) respectively. Each estimation for each group of sample will be performed repeatedly both for the institutionally underdeveloped and institutionally developed categories.

Sample Group 1: All Countries

The lag lengths of the response and regressor variables are assumed to be identical for notational simplicity. The Schwarz Bayesian information criterion (SIC) agreed upon the optimal lag length to be "2" when whole sample is considered[23]. Thus, the following specification will be used for the group of all countries.

$$\Delta y_{it} = \mu_i + \phi ECT_{t-1} + \lambda_1 \Delta y_{i,t-1} + \delta_1 \Delta X_{i,t-1} + u_{it} \qquad (10)$$

where $X_{it}^{'}=(FO_{it},\ FD_{it},\ TO_{it},\ GOV_{it}, INF_{it}, SEC_{it})^{'}$ and ECT is the equilibrium error correction term.

The long-run model given by (2) is estimated through unbalanced panel data fixed effects estimation technique both when the institutional development level is lower and higher than the threshold value of 0. It is followed by the error correction model (ECM) estimation using the residuals resulted from final long-run estimation given by equations (II). Both long- and short-run results along with the error correction estimates are displayed

[23] The whole sample is consisted of 105 countries and the longest time period is from 1960 to 2007. The lag lenth criteria is available in Appendix C.

in Table.10.a and Table.10.b respectively. The columns labeled with (I) are the long-run equations which involve all variables, and columns labeled with (II) are the long-run equations which only include the significant variables left over from (I). Similarly, equations numbered with (III) are the short-run equations which include all variables coming from the corresponding final long-run estimation, and equations numbered as (IV) are the final short-run model estimations.

Table.10.a also presents the results of the panel cointegration tests by Kao (1999) and Pedroni (2004) which both provide that there is at least one cointegration relationship between variables, which is one of the two major prerequisites of panel ARDL approach to long-run modelling, along with the ADF-Fisher chisquare statistic which tests if residuals resulted from the long-run equations have unit root or not. Consequently, Table.10.b also presents the Durbin-Watson (DW) statistics beneath.

For institutionally underdeveloped countries, it is seen that there exists 39 distinct groups and 544 observations overall. All explanatory variables are statistically significant at %5 percent level as can be seen in column (I) of Table.10.a. The financial openness measure seems to effect the log real income negatively in the long-run when countries are institutionally underdeveloped, which may indicate the necessity of improving institutional, governmental and political regime quality in order to benefit from financial openness. Financial development on the other hand has positive significant long-run growth effects at 0.50 level even when institutional quality is below the threshold level 0. Both government consumption and inflation have negative but small significant effects on long-run growth while trade openness have positive significant growth effects as anticipated. The ratio of secondary school enrollment which proxy the human capital also have positive significant effect. Summarizingly the long-run equation constructed for poor quality countries shows that all variables of interest have significant effects on the response variable, moreover both Kao(1999) and Pedroni (2004) cointegration tests proves that there is at least one cointegration relationship between our variables, and the ADF-Fisher chisquare statistic shows that the

residuals resulted from this long-run equation is I(0) which double checks the validity of this long-run relationship.

Table.10.a. Whole Sample Long-run Estimation

	Institutionally Underdeveloped		**Institutionally Developed**	
LONG RUN:	**(I)**	**(II)**	**(I)**	**(II)**
FO	-0.2530* [0.10214]	same as (I)	0.1026* [0.017236]	0.1022* [0.01711]
FD	0.4965* [0.09629]	same as (I)	0.7109* [0.04289]	0.7156* [0.04249]
TO	0.2478* [0.07274]	same as (I)	0.6333* [0.04383]	0.6548* [0.04275]
GOV	-0.0233* [0.04678]	same as (I)	0.0010 [0.00197]	
INF	-0.1481* [0.11441]	same as (I)	-0.0008 [0.00129]	
SEC	0.0566* [0.00217]	same as (I)	0.0153* [0.00093]	0.01531* [0.00091]
Constant	25.5629* [0.06648]	same as (I)	25.1589* [0.04765]	25.1877* [0.03863]
N **NxT**	**39** **544**	same as (I)	**68** **1379**	**70** **1422**
Adj-R^2	**0.70**	same as (I)	**0.55**	**0.56**
ADF-Fisher	160.991* (0.0000)	same as (I)	160.991* (0.0000)	168.681* (0.0067)
Pedroni	6.2384* (0.0000)	same as (I)	3.0776* (0.0003)	3.9977* (0.0001)
Kao	9.1833* (0.0000)	same as (I)	8.7138* (0.0000)	9.3793* (0.0000)

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by *Maddala* and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

Based on the equation given by column (I) of "Institutionally Underdeveloped" category in Table.10.a, the short-run dynamics are estimated through panel ARDL approach where the residuals resulted from the corresponding estimated long-run equation are used as error correction term (ECT). The results are presented in Table.10.b, namely equation (III) of "Institutionally Underdeveloped" column.

The short-run results shows us that the ECT is negative and significant which indicates the adjustment towards equilibrium, yet the magnitude of the coefficient shows that reaching back to equilibrium will proceed incredibly slowly. Moreover, it is seen that neither financial

Table.10.b. Whole Sample Panel ECM For PARDL(2,2)

	Institutionally Underdeveloped		**Institutionally Developed**	
SHORT RUN :	**(III)**	**(IV)**	**(III)**	**(IV)**
ECT	-0.0667* [0.01509]	-0.0695* [0.01493]	-0.2849* [0.00495]	-0.2842* [0.00488]
Δy_{t-1}	0.2608* [0.04692]	0.2506* [0.04607]	0.1611* [0.02678]	0.1731* [0.02621]
ΔFO_{t-1}	0.1048* [0.04929]	0.1131* [0.04784]	0.0456* [0.00900]	0.0444* [0.00872]
ΔFD_{t-1}	0.0407 [0.07126]		-0.0211 [0.02311]	
ΔTO_{t-1}	0.0092 [0.03123]		0.0004 [0.01459]	
ΔGOV_{t-1}	0.0050* [0.00149]	0.0044* [0.00144]		
ΔINF_{t-1}	0.0281** [0.01569]	0.0264** [0.01538]		
ΔSEC_{t-1}	0.0039 [0.00381]		0.0003 [0.00091]	
Constant	0.0251* [0.00333]	0.0279* [0.00282]	0.0253* [0.00131]	0.0248* [0.00121]
N **NxT**	**38** **516**	**39** **526**	**68** **1319**	**68** **1374**
Adj-R^2	**0.23**	**0.22**	**0.20**	**0.22**
DW	**2.10**	**2.08**	**1.99**	**1.99**

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic.

development nor trade openness has significant short-run effect on real income, hence income growth, for poor quality countries, while financial openness do have a positive but moderate significant effect. The human capital also does not have significant effect on the dependent variable in the short-run, which is well anticipated since educational developments require longer periods.

The insignificant variables in (III) has been removed and the short-run equation is re-estimated with the results presented by column (IV) of "Institutionally Underdeveloped" category in Table.10.b. The magnitude of the coefficients and the conclusions remains same as above.

On the other side, institutionally developed countries, are consisted of 68 distinct groups and 1379 observations overall. From Table.10.a, the estimated long-run model can be seen by equation (I) of "Institutionally Developed" column. All independent variables except for government consumption and inflation has positive and significant contribution to real income. The most important finding here is that, when countries improve their institutional development above a certain threshold (which is determined to be as "*polity2=0* " in this study), they can increase their amount of benefits from financial integration, financial development and trade openness. Moreover the negative effect of financial openness in institutionally underdeveloped countries, like being more crisis prone, vanishes and it becomes positive when they become institutionally developed.

Removing the insignificant regressors, the final long-run equation is estimated and presented by column (II) of "Institutionally Developed" category in Table.10.a. Both Kao(1999) and Pedroni (2004) cointegration tests proves that there is at least one cointegration relationship between the variables.

The residuals resulted from the long-run equation given by (II) of "Institutionally Underdeveloped" column in Table.10.a are used as error correction term (ECT) and the panel ARDL model is constructed in order to examine the short-run dynamics. The results are presented in Table.10.b; equation (III) of "Institutionally Developed" column is the initial and equation (IV) is the final estimated short-run equations.

The negative and significant ECT validates our system and the statistics show that trade openness and human capital do not have statistically significant effects in short-run. Moreover, it is seen that although financial development has positive and significant contribution to growth in

the long-run, it is not statistically significant in the short-run. Financial openness, on the other hand, is found to be significant even in the short-run. The ECT coefficient is estimated approximately as 0.30, which means the system could reach back to equilibrium in about three and a half years after a shock.

Sample Group 2: Industrial Countries

Second sample of countries is the advanced economies, again the optimal lag length is chosen to be "2" according to SIC as can be seen in Appendix C. Since advanced economies achieved great steps in means of institutional quality and democracy, only 10 observations and 2 groups are available for institutionally underdeveloped category. This, obviously, is insufficient to derive reasonable conclusions from any type of estimation, so we prefer to present the results for overall industrial countries without categorizing them as institutionally underdeveloped or well developed.

Table.11.a Industrial Countries Long-Run Estimation

LONG RUN:	**(I)**	**(II)**
FO	0.0867* [0.01622]	same as (I)
FD	0.4453* [0.04212]	same as (I)
TO	0.7236* [0.07683]	same as (I)
GOV	0.0326* [0.00361]	same as (I)
INF	-0.6505* [0.09113]	same as (I)
SEC	0.0049* [0.00095]	same as (I)
Constant	25.4813* [0.07253]	same as (I)
N **NxT**	**23** **645**	same as (I)
Adj-R^2	**0.66**	same as (I)
ADF-Fisher	127.896* (0.0000)	same as (I)
Pedroni	2.5601* (0.0150)	same as (I)
Kao	1.7513* (0.0399)	same as (I)

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by Maddala and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

As Table.11.a and Table.11.b show, financial development affects growth in a significant and positive way both in the short- and in the long-run.

Financial openness, also, is positively and significantly contributes to growth both in the short- and in the long-run, yet in a small degree with less than 10%. This is because the industrial countries are already largely integrated to the international markets, hence any increase in openness yields to positive but decent increase in growth. Trade openness on the other hand has a large positive impact on growth in the long-run, though its effects are small but negative in the short-run. Government consumption which has negative but insignificant coefficient in the short-run turns to have positive significant effects in the long-run. This can be interpreted such that, although government spendings are detrimental to growth in the short-run, it will become fruitful later.

Table.11.b Industrial Countries Panel ECM For PARDL(2,2)

SHORT RUN :	**(III)**	**(IV)**
ECT	-0.0328* [0.00682]	-0.0301* [0.00659]
Δy_{t-1}	0.3231* [0.04015]	0.3493* [0.03685]
ΔFO_{t-1}	0.0214* [0.00505]	0.0217* [0.00501]
ΔFD_{t-1}	0.0574* [0.02247]	0.0552* [0.02240]
ΔTO_{t-1}	-0.0703 [0.02044]	-0.0631* [0.02005]
ΔGOV_{t-1}	-0.0024** [0.00144]	
ΔINF_{t-1}	-0.0361** [0.02028]	-0.0415* [0.02005]
ΔSEC_{t-1}	0.0001 [0.00081]	
Constant	0.0175* [0.00152]	0.0165* [0.00136]
N **NxT**	**23** **621**	**23** **622**
Adj-R^2	**0.30**	**0.28**
DW	**1.87**	**1.89**

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic

Sample Group 3: Emerging Countries

Based on the level of the development of the economy, our third group of countries is the emerging economies. Again SIC chooses the optimal lag length as "2". The analyses are performed excluding two countries: namely Indonesia(77) and Philippiness(132) since their outlier nature violates the estimations.

Table.12.a Emerging Countries Long-Run Estimation

	Institutionally Underdeveloped		**Institutionally Developed**	
LONG RUN:	**(I)**	**(II)**	**(I)**	**(II)**
FO	0.43423* [0.20080]	0.4585* [0.04274]	0.5585* [0.10082]	0.5756* [0.09237]
FD	0.6849* [0.22421]	0.7833* [0.18638]	0.7143* [0.09623]	0.7073* [0.09402]
TO	-0.1656 [0.21695]		0.3612* [0.08782]	0.3555* [0.08475]
GOV	-0.0067 [0.01286]		-0.0027 [0.00458]	
INF	-0.1507 [0.11441]		0.0009 [0.001508]	
SEC	0.0507* [0.00409]	0.0472* [0.00617]	0.0331* [0.00259]	0.0328* [0.00248]
Constant	25.6558* [0.265809]	24.8623* [0.14058]	25.9498* [0.08820]	26.0310* [0.06544]
N **NxT**	**7** **79**	**9** **125**	**17** **349**	**18** **361**
Adj-R^2	**0.79**	**0.79**	**0.70**	**0.70**
ADF-Fisher	34.3026* (0.0002)	43.3040* (0.0001)	94.3461* (0.0000)	49.6028* (0.0065)
Pedroni	4.1291* (0.0001)	3.7953* (0.0003)	5.9564* (0.0000)	3.2037* (0.0024)
Kao	8.8926* (0.0000)	8.8781* (0.0000)	9.0133* (0.0000)	8.9898* (0.0000)

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by *Maddala* and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

More than half of the emerging countries have managed to render their institutional development above the threshold value, while still few of

them remains below. Table.12.a and Table.12.b displays the long-run and short-run results respectively for emerging countries which are institutionally underdeveloped and well developed.

Again starting with the institutionally underdeveloped category, it is seen that both financial openness and financial development promote economic growth in the long-run and surprisingly, this contribution is almost close to the ones which are institutionally developed. Though, in the short-run, financial development has no significance and financial openness has very little positive significant effect on growth for poorly institutionalized countries. Trade openness, government consumption and inflation, too, have no significant short-run and long-run impact.

Table.12.b Emerging Countries Panel ECM For PARDL(2,2)

	Institutionally Underdeveloped		**Institutionally Developed**	
SHORT RUN :	**(III)**	**(IV)**	**(III)**	**(IV)**
ECT	-0.0291** [0.02109]	-0.0437* [0.02247]	-0.0196* [0.00924]	-0.0199* [0.00915]
Δy_{t-1}	0.3319* [0.09057]	0.3625* [0.09328]	0.2536* [0.05307]	0.2589* [0.05299]
ΔFO_{t-1}	0.0588* [0.02930]	0.0476* [0.02800]	0.1648* [0.02692]	0.1582* [0.02659]
ΔFD_{t-1}	-0.04807 [0.10210]		-0.1016* [0.03905]	-0.0906* [0.03845]
ΔTO_{t-1}			-0.05245 [0.03385]	
ΔGOV_{t-1}				
ΔINF_{t-1}				
ΔSEC_{t-1}	0.0010 [0.00553]		0.0004 [0.00161]	
Constant	0.0371* [0.00730]	0.0355* [0.02069]	0.0290* [0.00309]	0.0284* [0.00302]
N **NxT**	**9** **120**	**9** **123**	**18** **346**	**18** **346**
Adj-R^2	**0.24**	**0.22**	**0.28**	**0.20**
DW	**2.00**	**1.95**	**1.98**	**1.99**

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic.

For emerging countries which are institutionally developed, one result is prominent: the financial development is negative and significant in the short-run, however it turns out to be largely positive and significant in the long-run. Coexistence of this positive long-run and negative short-run effects of financial development on growth can be explained with "short run pain, long-run gain" as Kaminsky and Schmukler (2003) stated. The financial development usually follows financial openness and financial openness has its short-run cost in developing countries who want to move on to a higher growth path.

Trade openness also fosters real income in the long-run, yet it has no statistical significance in the short-run. In addition, even when developing countries are institutionally developed, both government consumption and inflation have neither short- nor long-run effects on growth as for institutionally underdeveloped countries.

For both categories, the coefficient on the error correction term is negative and within the unit circle, which indicates the dynamic stability of our system in emerging economies.

Sample Group 4: Other Developing Countries

Based on the level of the development of the economy, the fourth group of countries is the other developing countries which we denote ODCs. Since Algeria violates the estimation process due to outliers, analyses are carried excluding Algeria.

In this sample group, it is seen that the level of the institutional development of the country being upper or lower than "0" creates considerable difference in means of growth effects.The long- and short-run results are depicted in Table.13.a and Table.13.b.

In the short-run, the financial openness has positive and significant yet very small effect on income for the institutionally underdeveloped ODCs, however, in the long-run the growth effect of financial openness is significantly negative. Thus, financial openness hinders growth in long-run if ODCs can not achieve high

quality institutions. In the long-run, only institutionally developed ODCs derive considerable growth benefits from financial openness.

In means of financial development, it is seen that it is not statistically significant in either long- or the short-run for institutionally underdeveloped ODCs. However, for institutionally developed ODCs, financial development exerts positive and significant impact on economic growth in the long-run, and still insignificant in the short-run. It tells us that other developing countries should first of all focus on long-run policies to upgrade their institutional development level in order to benefit from financial development and integration.

Table.13.a Other Developing Countries Long-Run Estimation

	Institutionally Underdeveloped		**Institutionally Developed**	
LONG RUN:	**(I)**	**(II)**	**(I)**	**(II)**
FO	-0.4752* [0.12097]	-0.3907* [0.09521]	0.4318* [0.08597]	0.6323* [0.080519]
FD	-0.3532* [0.16736]		0.3491* [0.16775]	0.4995* [0.16832]
TO	0.3567* [0.07919]	0.3642* [0.06503]	0.4326* [0.07795]	
GOV	-0.0195* [0.00356]	-0.0195* [0.00269]	-0.0035 [0.00248]	-0.0051* [0.00254]
INF	-0.0990** [0.05309]		-0.1143* [0.05466]	
SEC	0.0729* [0.00363]	0.0660* [0.00239]	0.0154* [0.00256]	0.0166* [0.00252]
Constant	24.8871* [0.07686]	24.9378* [0.05283]	23.5707* [0.07064]	23.7647* [0.06141]
N **NxT**	**26** **381**	**28** **518**	**25** **364**	**26** **369**
Adj-R^2	**0.66**	**0.68**	**0.49**	**0.45**
ADF-Fisher	96.9676* (0.0000)	137.515* (0.0000)	93.4853* (0.0000)	95.7243* (0.0000)
Pedroni	5.3520* (0.0000)	5.5391* (0.0003)	3.5682* (0.0002)	2.9866* (0.0046)
Kao	3.9039* (0.0000)	8.4067* (0.0000)	9.2269* (0.0000)	9.3014* (0.0000)

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by *Maddala* and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

Table.13.b Other Developing Countries Panel ECM For PARDL(2,2)

	Institutionally Underdeveloped		**Institutionally Developed**	
SHORT RUN :	**(III)**	**(IV)**	**(III)**	**(IV)**
ECT	-0.0852* [0.01729]	-0.0898* [0.01696]	-0.0451* [0.01426]	-0.0455* [0.0138]
Δy_{t-1}	0.156* [0.04533]	0.1629* [0.04509]	0.0393 [0.05489]	
ΔFO_{t-1}	0.1138* [0.05775]	0.1290* [0.05675]	0.0704** [0.03613]	0.0642** [0.03541]
ΔFD_{t-1}			0.0473 [0.07890]	
ΔTO_{t-1}	-0.0458 [0.03213]			
ΔGOV_{t-1}	0.00277* [0.00139]	0.0030* [0.00138]	0.0006 [0.00066]	
ΔINF_{t-1}				
ΔSEC_{t-1}	0.0018 [0.0048]		0.0026 [0.00455]	
Constant	0.0241* [0.00313]	0.0355* [0.02069]	0.0285* [0.00355]	0.0313* [0.00221]
N **NxT**	**28** **504**	**28** **504**	**24** **359**	**24** **350**
Adj-R^2	**0.19**	**0.18**	**0.15**	**0.14**
DW	**2.01**	**2.03**	**1.88**	**1.86**

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic.

Sample Group 5: Eastern Europe Countries

The fifth and the smallest group of countries studied is the eastern European (EE) countries which are mainly remainings of old eastern block. The optimal lag length is again chosen as "2" regarding AIC and SBC. For this sample group, the variable for secondary school enrollment (SEC) is removed from the equations since related data does not exist or is not sufficient to carry out an estimation. Rest of the control variables and the interest variables remain as before. The long-run ad short-run estimation results are given in Table.14.a and Table.14.b.

Due to the fact that there exists insufficient number of groups and observations, clearly 3 groups and 10 observations, for institutionally underdeveloped category, the corresponding results can not be interpreted in reason. To this end, the long- and short-run dynamics of eastern European countries on the overall are investigated.

Table.14.a Eastern Europe Countries Long-Run Estimation

LONG RUN:	**(I)**
FO	0.1706* [0.04185]
FD	0.9024* [0.10829]
TO	0.2126* [0.07409]
GOV	-0.0099* [0.00371]
INF	-0.0226* [0.01031]
SEC	-
Constant	25.3912* [0.11019]
N **NxT**	**14** **196**
Adj-R^2	**0.67**
ADF-Fisher	68.3723* (0.0000)
Pedroni	-5.2788* (0.0000)
Kao	2. 5249* (0.0058)

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by *Maddala* and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

As it can be seen from Table.14.a, both financial openness and financial development are positively and significantly related to real income in the long-run. Especially, financial development indicator has the largest positive effect in the long-run compared to other determinants included. Trade openness exerts a positive and significant impact in the long-run either. Again, the ADF-Fisher unit root test on estimated residuals and the Kao and Pedroni cointegration tests confirm a long-run relationship between the variables of interest. While financial development lose its significance in the short-run, financial openness has positive and significant growth effects also in short-run. The negative and significant sign for ECT verifies an equilibrium adjustment.

Table.14.b Eastern Europe Countries Panel ECM For PARDL(2,2)

SHORT RUN :	**(I)**	**(II)**
ECT	-0.0385 [0.02949]	-0.0457* [0.02769]
Δy_{t-1}	0.3170* [0.06809]	0.4086* [0.05897]
ΔFO_{t-1}	0.0344 [0.02152]	0.0479* [0.02114]
ΔFD_{t-1}	0.1169 [0.07710]	
ΔTO_{t-1}	0.0089 [0. 03053]	
ΔGOV_{t-1}	0.0040* [0.00148]	0.0025** [0.00135]
ΔINF_{t-1}	0.0028 [0.00241]	
ΔSEC_{t-1}	-	-
Constant	0.0268* [0.00389]	0.0227* [0.00351]
N	**14**	**14**
NxT	**170**	**182**
Adj-R^2	**0.44**	**0.43**
DW	**1.62**	**1.69**

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic.

If overall results are to be summarized, the PARDL estimation shows that except other developing countries, economic growth is positively and significantly linked to the measures of financial openness and financial development in the long-run regardless of the level of the institutional development. However, when a country is institutionally well-developed its growth benefits from finance considerably increases. Henceforth, this study find evidence in favor of the supply-leading view of financial development in the long-run for industrial, emerging and eastern Europe countries. For ODCs the results change as the level of institutional development changes. ODCs must reach at least the institutional development threshold in order to be able to derive growth benefits from financial openness and financial development in the long-run.

On the other hand, short-run dynamics tell a different story. Regardless of the level of economic development, financial development has no short-run growth effects for institutionally underdeveloped countries. On the contrary, whether the level of institutional development is below or above the threshold, financial openness has positive and significant impact on growth for the emerging, other developing and eastern Europe countries in the short-run. For the sample group of institutionally well developed emerging countries, financial development behaves differently: although it has negative and significant effect on growth in the

short-run, it becomes positive and significant in the long-run. This can be interpreted with Kaminsky's "short-run pain, long-run gain" phrase, in other words if emerging countries can achive high institutional development, then financial development certainly enhances growth benefits in the long-run even though improvements in financial development will diminish the real income in the short-run.

4.3. Short- and Long-Run Growth Effects of Financial Development and Financial Openness According to The Income Level

The panel ARDL approach to long-run modelling is also performed considering different income levels of countries. The long- and short-run dynamics of the growth determinants are analyzed and compared between high income, middle income and low income countries. The results are displayed in Table.15.a and Table.15.b.

It is seen that, for high and middle income countries, the relationship between financial openness and growth is positive and significant in the long-run while for low income countries it is significantly negative. Besides, the estimate for financial openness measure is greater for middle income countries than the one for high income countries which means middle income countries derive more growth benefits as their financial integration expands. The ADF-Fisher unit root test on the resulting residuals confirm them to be stationary, and both Kao and Pedroni cointegration tests verify the existence of a long-run relationship between our variables. The estimated short-run equation yields a negative and significant ECT for each income group, which also indicates an equilibrium long-run relationship, though the speed of adjustments are quite low. The financial openness measure is positive and significant also in the short-run for high and middle income countries.

Therefore, a positive and significant relationship between financial openness and income growth coexists both for long- and short-run when income level is middle or high. For low income countries, on the other hand, short-run coefficient for financial openness is statistically insignificant.

Table.15.a Long-Run Estimation Results According To Income Groups

	HIGH INCOME		**MIDDLE INCOME**		**LOW INCOME**	
LONG RUN:	**(I)**	**(II)**	**(I)**	**(II)**	**(I)**	**(II)**
FO	0.10981* [0.02019]	same as (I)	0.3109* [0.07265]	0.4212* [0.06764]	0.0112 [0.10009]	-0.1662** [0.09587]
FD	0.6753* [0.05148]	same as (I)	0.6289* [0.07670]	0.6464* [0.07578]	-0.0909 [0.18469]	
TO	0.3524* [0.08026]	same as (I)	0.4720* [0.06179]	0.4271* [0.06082]	0.4032* [0.07096]	0.5552* [0.06927]
GOV	0.0134* [0.00353]	same as (I)	-0.0121* [0.00327]	-0.0139* [0.00323]	-0.0082* [0.00231]	-0.0098* [0.00245]
INF	-0.2623* [0.01153]	same as (I)	-0.0001 [0.00150]		-0.0057 [0.05078]	
SEC	0.0112* [0.00109]	same as (I)	0.0322* [0.00168]	0.0318* [0.00168]	0.0499* [0.00247]	0.0477* [0.00239]
Constant	25.8000* [0.08009]	same as (I)	25.0892* [0.05728]	25.2422* [0.05695]	24.5506* [0.05975]	24.8621* [0.05342]
N **NxT**	27 750	same as (I)	33 852	34 879	16 334	17 461
Adj-R^2	0.53	same as (I)	0.64	0.64	0.66	0.55
ADF-Fisher	118.766* [0.0000]	same as (I)	6.9037* [0.0000]	89.6987* [0.0402]	NA	NA
Pedroni	1.8001** [0.0789]	same as (I)	1.8001** [0.0789]	2.1636* [0.0384]	3.2282* [0.0022]	2.7422* [0.0093]
Kao	1.9712* [0.0243]	same as (I)	3.5539* [0.0007]	6.8304* [0.0000]	8.0101* [0.0000]	4.4755* [0.0000]

Note that; standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. ADF-Fisher is the panel unit root test proposed by *Maddala* and Wu (1999) applied to the resulted residuals of the equations. Pedroni and Kao are ADF statistics for panel cointegration tests developed by Pedroni (2004) and Kao (1999) respectively. The values in (.) are the p-values.

Table.15.b Panel ECM For PARDL(2,2) According To Income Groups

	HIGH INCOME		**MIDDLE INCOME**		**LOW INCOME**	
SHORT RUN :	**(III)**	**(IV)**	**(III)**	**(IV)**	**(III)**	**(IV)**
ECT	-0.0208* [0.00529]	-0.0206* [0.00502]	-0.0530* [0.00744]	-0.0521* [0.0073]	-0.0299 [0.01838]	-0.0363 [0.01358]
Δy_{t-1}	0.3568* [0.00354]	0.3652* [0.03459]	0.2548* [0.03430]	0.2715* [0.03309]	-0.0025 [0.05771]	
ΔFO_{t-1}	0.0251* [0.00566]	0.02346* [0.00549]	0.1248* [0.02576]	0.1236* [0.02468]	-0.0024 [0.05504]	
ΔFD_{t-1}	0.0401** [0.02289]	0.0400* [0.02275]	-0.0457 [0.04035]		-0.0122 [0.10257]	
ΔTO_{t-1}	-0.0288 [0.01883]		-0.0084 [0.02236]		0.0517 [0.03157]	
ΔGOV_{t-1}	-0.0015 [0.00101]		0.0031 [0.00120]		-0.0003 [0.00073]	
ΔINF_{t-1}	-0.0037 [0.00647]		-0.0001 [0.00023]		0.0189 [0.01466]	
ΔSEC_{t-1}	0.0005 [0.00091]		0.0016 [0.00178]		0.0025 [0.00409]	
Constant	0.0171* [0.00145]	0.0167* [0.00139]	0.0267 [0.00226]	0.0265* [0.00199]	0.0293* [0.00333]	0.0268* [0.00231]
N **NxT**	27 722	27 724	33 818	34 856	16 318	17 461
Adj-R^2	0.34	0.33	0.21	0.21	0.12	0.09
DW	1.92	1.92	2.05	2.04	2.03	1.92

Note that; standard errors are in brackets [.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. DW stands for Durbin-Watson test statistic.

The long-run estimate for financial depth also has positive and statistically significant sign for high and middle income countries, yet it is insignificant for low income countries. Interestingly, it should be noted that the estimated coefficients for financial development do not differ from each other very much for high and middle income countries. On the other hand, short-run dynamics are way too

different than long-run. Financial development is positively and significantly related to growth for high income countries in the short-run while it is totally insignificant for middle and low income countries.

Trade openness, government consumption and secondary school enrollment do all have positive and significant long-run estimates for each income group, though they are insignificant in the long-run.

4.4. Dynamic Panel Estimation with Generalized Method of Moments

In previous sections of this chapter, we treated the level and lagged values of our macroeconomic variables as potentially exogeneous, however, the endogeneity of the macroeconomic variables has been an important discussion in the econometric literature. In this section, a generalized method of moments (hereafter GMM, Hansen, 1982) procedure for dynamic panel data models developed by Arellano and Bond (1991) and augmented by Arellano and Bover (1995) is used in order to deal with multiple endogeneous regressors in an unbalanced panel setting and to solve the potential simultaneity and thus endogeneity problem of variables.

Roodman (2006) summarizes that, Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998) dynamic panel estimators are designed for situations with (i) small T, large N panels; (ii) a linear functional relationship; (iii) a single left-hand-side variable that is dynamic; (iv) independent variables that are not strictly exogenous; (v) fixed individual effects; and (vi) heteroskedasticity and autocorrelation within individuals but not between.

Arellano and Bond estimation starts by first differencing all regressors in order to eliminate the country-specific effects, and uses GMM in order to obtain "*Difference GMM Estimator*". Although, this differencing solves the country-specific effect problem, it brings a correlation between the new disturbance term and the lagged dependent variable. Hence, Arellano and Bover (1995) and Blundell and Bond (1998) proposed augmeting the Arellano and Bond (1991) estimator by using the lagged values of the explanatory variables as instruments. However, there are some statistical shortcomings of this difference estimator, too. First of all

first differencing removes the cross-country variation and if the regressors are persistent over time than lagged regressors are no more than weak instruments which may lead to biased estimates (Levine, 2009). In order to deal with these issues, Arellano and Bover (1995) propose an alternative method that introduces more instruments and builds a system of two regression equations in differences and in levels estimated jointly to yield a "*System GMM Estimator*".

Consider the following regression:

$$y_{it} = \alpha y_{i,t-1} + \beta' X_{it} + \eta_i + \varepsilon_{it} \qquad (11)$$

where y is the logarithm of real per capita GDP as defined before, X is the set of regressor variables, η is an unobserved country-specific effect and ε is the error term with i and t being cross-country and time index, respectively. In order to eliminate the country-specific effect, the first difference of equation (11) is taken as follows

$$y_{i,t} - y_{i,t-1} = \alpha \left(y_{i,t-1} - y_{i,t-2} \right) + \beta' \left(X_{i,t} - X_{i,t-1} \right) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \qquad (12)$$

Here the new error term is correlated with the lagged dependent variable, hence instruments - consisting of previous observations of the independent variables and lagged dependent variables- are required to deal with this issue and the potential endogeneity of the explanatory variables in order to proceed with GMM estimation. To overcome the potential biases arised from this *difference estimator*, a new estimator , so called *system estimator*, combines instruments for the regression in differences as above with lagged differences as a new set of instruments for the regression in levels together in a system.

The regression equation to be estimated is the one given by (2) with no constant since this is a difference equation form model, again using at most 10 non-overlapping data averages spanning the period 1960-2007 for 105 countries. To reduce potential biases and to obtain more precise estimators, we used system estimator. In addition, in order to address the consistency of the GMM estimators, two specification tests suggested by Arellano and Bond (1991) and Arellano and Bover (1995) are taken into account. The

first test investigates if error term is serially uncorrelated or not; the model specification is said to be valid if the corresponding null hypothesis is not rejected. The second test, known as the Sargan Test of overidentifying restrictions, examines the overall validity of instruments used and failure to reject the null hypothesis validates the model.

Sticking to the previous version of estimation framework, the dynamic GMM procedure will be applied seperately for the industrial countries sample (IND), the emerging countries sample (EMG), the other developing countries sample (ODC) and the eastern Europe countries sample (EE) in turn. Each estimation for each group of sample will be performed both for institutionally underdeveloped and institutionally developed countries, in other words countries who are below or above the predefined threshold variable *polity2=0*.

The GMM regression results are reported in Table.16 through Table.19[24]. Recall that, a general estimation for industrial countries and for eastern Europe countries are carried since there are almost none institutionally underdeveloped countries in those sample groups. And, the SEC variable is removed from the proposed model for eastern European sample since those countries do lack of sufficient observations for that specific variable. Before proceeding with the coefficient estimates, it is seen that both Sargan and second-order serial correlation tests validate the model specification and the instruments for each sub-sample.

As it is seen in Table.16, both financial openness and financial development are positive and significant determinants of economic growth in advanced economies. These results are consistent with the findings of the previous sections. The estimated coefficient of financial openness is again small as the reasons are mentioned previously. All other variables in the information set are also found to be positive and significant. The specification tests verify that the error terms are uncorrelated and the model specification is valid.

[24] The dynamic GMM results are obtained using the closest appropriate lag for each variable in the regression. Only a single instrument for each variable is used since use of more would lead to an overfitting problem (implied by Sargan p-values close to 1).

Table.16. Dynamic GMM System Estimator: Industrial Countries

	(I)
FO	0.0487* [0.01047]
FD	0.4493* [0.06236]
TO	0.9016* [0.10652]
GOV	0.0300* [0.00289]
INF	-1.4972* [0.18748]
SEC	0.0065* [0.00061]
Log Initial Income	0.0065* [0.00200]
N **NxT**	**23** **126**
m2	**0.199**
Sargan	**0.124**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

Table.17. Dynamic GMM System Estimator: Emerging Countries

	Institutionally Underdeveloped		**Institutionally Developed**	
	(I)	**(II)**	**(I)**	**(II)**
FO	0.3010 [0.30172]	0.5343* [0.03507]	0.6248* [0.28638]	0. 9201* [0.065048]
FD	-1.3623 [2.84712]		0.5968* [0.25890]	0.3576* [0.10823]
TO	0.6873 [2.71702]		0.2619 [0.34672]	
GOV	0.2017 [0.10991]		-0.0121 [0.01358]	
INF	0.5101 [0.36298]		0. 0020 [0.01058]	
SEC	0.0836* [0. 03546]	0.0295* [0.01061]	0.0431* [0.00605]	0.0438* [0.00271]
Log Initial Income	0.1559 [0.11198]	0.0038 [0.00837]	-0.0025 [0.00626]	-0.0006 [0.00349]
N **NxT**	**6** **20**	**11** **33**	**17** **74**	**18** **77**
m2	**0.824**	**0.122**	**0.588**	**0.446**
Sargan	**0.131**	**0.238**	**0.226**	**0.124**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

Table.18. Dynamic GMM System Estimator: Other Developing Countries

	Institutionally Underdeveloped		**Institutionally Developed**	
	(I)	**(II)**	**(I)**	**(II)**
FO	0.3109* [0.08923]		0.9685* [0.14081]	0.6359* [0.07828]
FD	0.0608 [0.25410]		0.2918* [0.18350]	0.6082* [0.13811]
TO	0.7675* [0.09356]	0.7325* [0.07684]	0.5366* [0.11723]	0.9820* [0.11352]
GOV	-0.0310* [0.00441]	-0.0130* [0.00637]	0.0005 [0.00260]	
INF	0.1827 [0.17047]		0.3269* [0.13439]	
SEC	0.0511* [0.00366]	0.0503* [0.00444]	0. 0072* [0.00337]	0.0090* [0.00194]
Log Initial Income	-0.0064 [0.00262]	-0.0010 [0.00469]	-0.0035 [0.00334]	0.0051 [0.00135]
N	**24**	**25**	**23**	**23**
NxT	**80**	**86**	**68**	**69**
m2	**0.955**	**0.410**	**0.932**	**0.582**
Sargan	**0.307**	**0.966**	**0.096**	**0.164**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

Table.19. Dynamic GMM System Estimator: Eastern Europe Countries

	(I)	**(II)**
FO	0.2560** [0.15412]	0.2922* [0.03012]
FD	1.0757* [0.23152]	0.7365* [0.25098]
TO	0.0881 [0.20081]	
GOV	-0.0130* [0.00896]	-0.0186* [0.00788]
INF	-0.0249* [0.04146]	
Log Initial Income	0.0014* [0.00281]	-0.0024 [0.00312]
N	**14**	**14**
NxT	**37**	**37**
m2	**0.080**	**0.162**
Sargan	**0.179**	**0.199**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

According to the results in Table.17, the institutionally underdeveloped emerging countries can not derive growth benefits from financial development unless they exceed the threshold. However, financial openness do spur growth for this group of countries whether they are institutionally underdeveloped or well-developed. Still, if emerging economies manage a certain level of institutional development, their gains from financial openness doubles from 50% to 90% compared to the poorly institutionalized countries. Another positive and significant long-run determinant of growth in emerging countries is found to be the human capital. Again specification tests confirms the models and the uncorrelated error terms.

The dynamic GMM results for other developing countries also tells that the level of institutional development matters in order to derive growth benefits both from financial openness and financial development. As it can be seen in Table.18, neither financial openness nor financial development is significant for real income in institutionally underdeveloped ODCs. On the other hand, as long as the level of intitutional development is higher than the threshold, both financial depth and financial integration become meaningful positive determinants of growth. Trade openness and the level of secondary school enrollment are both significant for the economic growth of ODCs regardless of the institutional development.

Lastly, Table.19 presents the dynamic GMM results for eastern Europe sample. Both financial openness and financial development are found to effect growth positively and significantly for this groups of countries also. The government spending, on the contrary, has a negative significant effect on growth.

Since the empirical framework of this study is interested if threshold effect of institutional development behaves as a collateral channel spurring growth especially for emerging and other developing countries, we, next, attempt to explain if financial openness, financial development, and their interaction with institutional development are significant or not. Two new variables are defined as follows

$$FO_{it}*D(polity2_{it}>0)$$
$$FD_{it}*D(polity2_{it}>0)$$

where $D(polity2_{it}>0)$ is an indicator variable which is equal to 1 if the average level of institutional development of the country, i.e. polity2, is above the threshold value of 0 at the time.

Table.20 and Table.21 presents the dynamic GMM results with interaction terms for emerging and other developing countries, respectively. It is seen that the level of development doesn't matter for financial openness and financial development spurring growth in emerging economies. Both variables effect economic growth positive and significantly in emerging countries regardless of the institutional quality. Though, the amount of the effect increases when an emerging country achieves to exceed the threshold level for institutional development. On the other hand, for other developing countries, financial openness is not a significant element for growth process if the country is institutionally underdeveloped. However, financial openness enhances growth in a positive manner provided that the institutional development is above the predetermined threshold value of 0. Besides, for other developing countries, financial development do have positive and significant effects on economic growth whether the institutional development is above or below the threshold. Hence, the difference is significant in means of financial openness and growth, yet not for financial development for other developing countries.

Table.20. Dynamic GMM System Estimator with Interactions: EMG

	(I)	**(II)**
FO	0.4143* [0.07985]	0.3393* [0.08367]
FD	0.8404* [0.21299]	0.8221* [0.10968]
FO*D(polity2>0)	0.0950 [0.31086]	**0.3760* [0.17734]**
FD*D(polity2>0)	-0.1270 [0.26586]	**0.2631 [0.25536]**
GOV	-0.0088 [0.01650]	
INF	0.0029 [0.01561]	
SEC	0.0441* [0.00907]	0.0337* [0.00226]
Log Initial Income	-0.0001 [0.00665]	-0.0011 [0.00461]
N	**18**	**19**
NxT	**88**	**94**
m2	**0.354**	**0.210**
Sargan	**0.197**	**0.207**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

Table.21. Dynamic GMM System Estimator with Interactions: ODC

	(I)	**(II)**
FO	0.0963 [0.23494]	
FD	1.1156* [0.30452]	1.1314* [0.15646]
FO*D(polity2>0)	0.7221* [0.24878]	**0.7697* [0.08626]**
FD*D(polity2>0)	0.1877 [0.21564]	**0.1638 [0.17404]**
GOV	-0.0198* [0.00393]	-0. 0197* [0.00244]
INF	0.1452** [0.08319]	0.1145** [0.06670]
SEC	0.0205* [0.00349]	0.0196* [0.00330]
Log Initial Income	-0.0017 [0.00242]	-0.0031 [0.00210]
N **NxT**	**31** **149**	**31** **149**
m2	**0.113**	**0.114**
Sargan	**0.024**	**0.037**

Note that; the dependent variable is the logarithm of real GDP per capita, standard errors are given in brackets[.] Signs (*) and (**) denote the significance at the 5% level and 1% level respectively. m2 is the p-value regarding Arellano and Bond(1991) test for 2nd order serial correlation. Sargan is the p-value regarding Sargan's test of model specification and instrumental validity.

4.5. Overview

Throughout this chapter, the effects of financial openness and financial development on econometric growth is investigated using various econometric methods. The analyses based on non-overlapping averaged data and annual data have been resulted in consistent results which are generally in favor of a positive finance-growth nexus and in support of the importance of institutional development. In this section, a brief summary of the overall results will be presented through Table.22 to Table.25.

For the advanced countries, which are mostly industrialized and institutionally developed, it can be seen from Table.22 that nearly all variables have significant effect on real income. Despite the positive influence of financial integration on growth, all three methodologies display that it is moderate compared to the other country groups and this is mainly due to the fact that they are almost totally integrated to the financial markets. Besides, financial development is a positive significant determinant of growth hence it can be said that the supply-leading hypothesis arguably holds for advanced economies.

Table.22. Summarized Results: Industrial Countries

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO	0.0660 [0.03280]	0.0487 [0.01047]	0.0867 [0.01622]
FD	0.3809 [0.09937]	0.4493 [0.06236]	0.4453 [0.04212]
TO	0.7032 [0.20811]	0.9016 [0.10652]	0.7236 [0.07683]
GOV	0.0310 [0.00902]	0.0300 [0.00289]	0.0326 [0.00361]
INF	-1.0875 [0.26073]	-1.4972 [0.18748]	-0.6505 [0.09113]
SEC	0.0037 [0.00210]	0.0065 [0.00061]	0.0049 [0.00095]
Constant	25.6248 [0.21972]		25.4813 [0.07253]
Log Initial Income	0.0017 [0.00660]	0.0065 [0.00200]	

Note that; this table displays only the significant variables in the estimated model. The values in [.] are the standard errors. And the gray shaded cells represent that specifi variable does not exist in the estimation process.

For the emerging countries, the results only slightly differ between institutionally underdeveloped and developed countries. All three methods claim that financial openness is a positive significant determinant of economic growth in emerging countries no matter what the level of institutional wellness is. Yet, the effects of financial openness on growth is merely larger for institutionally developed emerging economies. Financial development is also found to be positively and significantly effecting growth for this group of countries.

Table.23. Summarized Results: Emerging Countries

(a) Institutionally Underdeveloped

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO	0.3589 [0.08064]	0.5343 [0.03507]	0.4585 [0.04274]
FD	0.8603 [0.46627]		0.7833 [0.18638]
TO			
GOV			
INF			
SEC	0.0252 [0.00536]	0.0295 [0.01061]	0.0472 [0.00617]
Constant	23.5923 [0.53734]		24.8623 [0.14058]
Log Initial Income	0.0088 [0.01744]	0.0038 [0.00837]	

Table.23. *continues*

(b) Institutionally Developed

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO	0.6763 [0.17838]	0.9201 [0.06505]	0.5756 [0.09237]
FD	0.5838 [0.21553]	0.3576 [0.10823]	0.7073 [0.09402]
TO	0.3494 [0.18431]		0.3555 [0.08475]
GOV			
INF			
SEC	0.0249 [0.00512]	0.0438 [0.00271]	0.0328 [0.00248]
Constant	26.2285 [0.21383]		26.0310 [0.06544]
Log Initial Income	-0.0050 [0.00673]	-0.0006 [0.00349]	

Note that; this table displays only the significant variables in the estimated model. The values in [.] are the standard errors. And the gray shaded cells represent that specifi variable does not exist in the estimation process.

For the other developing countries, the results much differ between institutionally underdeveloped and developed countries. All three methods claim that financial development has no significant growth effects for other developing countries unless they are institutionally developed. Similarly, the average panel data set claims that, for other developing countries to benefit from financial openness, they should manage higher than threshold institutional development.

Table.24. Summarized Results: Other Developing Countries

(a) Institutionally Underdeveloped

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO			-0.3907 [0.09521]
FD			
TO	1.1374 [0.22697]	0.7325 [0.07684]	0.3642 [0.06503]
GOV	-0.0195 [0.00902]	-0.0130 [0.00637]	-0.0195 [0.00269]
INF			
SEC	0.0534 [0.00454]	0.0503 [0.00444]	0.0660 [0.00239]
Constant	24.3084 [0.22132]		24.9378 [0.05283]
Log Initial Income	0.0028 [0.00740]	-0.0010 [0.00469]	

Table.24. *continues*

(b) Institutionally Developed

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO	0.7114 [0.14494]	0.6359 [0.07828]	0.6323 [0.080519]
FD	0.8224 [0.25236]	0.6082 [0.13811]	0.4995 [0.16832]
TO	0.7961 [0.16465]	0.9820 [0.11352]	
GOV			-0.0051 [0.00254]
INF			
SEC		0.0090 [0.00194]	0.0166 [0.00252]
Constant	23.9349 [0.15530]		23.7647 [0.06141]
Log Initial Income	-0.0041 [0.00462]	0.0051 [0.00135]	

Note that; this table displays only the significant variables in the estimated model. The values in [.] are the standard errors. And the gray shaded cells represent that specifi variable does not exist in the estimation process.

Finally, for the sample covering eastern Europe countries, as displayed by Table.25, it is again seen that financial openness and financial development have positive and significant effects on economic growth. Since the great majority of the countries in this sample are institutionally developed, this finding may due to this collateral channel. One noticeable point is that, the largest coefficient estimates for financial development appears in this sub-sample, hence their growth benefits from financial development are the most compared to other country groups.

Table.25. Summarized Results: Eastern Europe Countries

	5-Year Averaged Panel		**Annual Panel**
	Fixed Effects	**Dynamic GMM**	**PARDL Long-Run**
FO	0.2376 [0.05266]	0.2922 [0.03012]	0.1706* [0.04185]
FD	0.9454 [0.22210]	0.7365 [0.25098]	0.9024* [0.10829]
TO			0.2126* [0.07409]
GOV	-0.0179 [0.00912]	-0.0186 [0.00788]	-0.0099* [0.00371]
INF			-0.0226* [0.01031]
Constant	25.7304 [0.21110]		25.3912* [0.11019]
Log Initial Income	-0.0032 [0.00347]	-0.0024 [0.00312]	

Note that; this table displays only the significant variables in the estimated model. The values in [.] are the standard errors. And the gray shaded cells represent that specifi variable does not exist in the estimation process.

To sum up, the results of this study shed light to the finance-growth relationship through different methodologies and proves that the level of economic development and level of institutional development matters in order to be able to derive solid conclusions on the nexus.

CHAPTER V

CONCLUSION

This study mainly investigates the impact of financial openness and financial development on economic growth which has been one of the main research topics in international macroeconomics. We also consider the impact of the level of institutional quality and the political regime characteristic on the relationship between finance and growth. The study employs a standard set of macroeconomic and control variables used in the growth literature with the addition of meticuluously chosen financial development and de facto financial openness measures. This thesis contributes to the ongoing literature by embracing a broader variable to proxy for institutional quality embedded in political regime characteristic next to the conventional growth determinants. It also examines the finance-growth nexus for different country samples which are categorized according to the level of development of their economy in order to identify whether the sign and magnitude of financial openness and financial development on growth change as countries' level of institutional development changes.

The economic literature posits that, in a world of increased capital flows, a well-functioning economy requires a well-regulated financial system which efficiently channels savings into investment. Thus, a sound financial system is essential for supporting economic growth and must be integrated to the development policies. The studies on finance-growth nexus has made substantial progress from pure cross sectional or single country time series studies to dynamic panel specifications including country specific micro-level studies. Although, it is widely agreed that there are important relationships between finance and development, there is still no consensus on the exact nature of these relationships, especially on the causality between the two. The review of the empirical and theoretical literature on the relationship between financial openness, financial development and growth suggests conflicting results. The

results of this study shed light to the finance-growth relationship and favor the supply leading view claiming that the level of institutional development and level of economic development matter for deriving solid conclusions on the nexus.

The average growth rate of the countries in our sample is approximately 4%, while the largest average growth rate is seen in emerging countries (EMG) with a rate of 5% and the smallest one occurs for eastern European countries (EE) with a rate of 2%. In this panel data setting, the within-country variation for growth is much larger than the between- country variation for the overall sample and for each of the sub-samples. As it is anticipated, the highest mean financial openness is seen in industrial countries as pioneers of the idea of financial globalization and as they have been largely integrated to the international markets for a long time. It is followed by the eastern European and the emerging countries with 47% and 42% , respectively. The other developing countries (ODC) on the other hand are the least financially opened group with a rate of 29%. The variation due to the interaction between samples and within each individual sample in terms of financial openness measure are nearly close to eachother. Similar behaviour holds for financial development. The highest average financial depth occurs for industrial countries with 70% again followed by emerging and eastern European countries with 40%. The polity2 variables which indicates the level of institutional development in our study also signs to the democracy characteristic of a country. As one can expect, it takes the largest mean value for industrial countries with a score of 9.2 which is nearly equal to the maximum score 10. And due to the dominating countries with ill regimes and poor governance, the ODCs have the smallest average polity score, -1.0-, which is smaller than the pretermined threshold value of polity2=0. The emerging countries do have an average polity score of 3.0 which is greater than 0 yet this indicates insufficient but promising institutional quality.

The study also examines the evolution of financial openness and financial development through 1970-2007 and roughly depicts their relation with growth using figures. There is an absolute increase in international financial integration especially by mid-1980s in the overall, yet the ODCs present some instable ups and downs through time while other sub-samples manage a consistent increase. From the point of financial development, both the liquid liabilities and the private credits tend to move together increasingly through time. The figures presenting the

simple correlation between economic growth and de facto financial openness display the absence of any apperant relationship[25]. In country sub-samples, only eastern European countries present a slight but positive linear relationship between growth and financial integration, yet none others indicate a clear relationship. Similar argument holds for financial development, too. The figurative interpretation of growth and financial development relationship seems not to follow a specific pattern. Due to these facts, although they are not sufficient to derive exact conclusions, this study considers that the finance-growth relationship may change as some other indirect factors such as the level of a country's institutional development change. Indeed, the simple scatter plots indicate that there could be a positive link between financial openness and institutional development for emerging and other developing countries. Same argument holds for the financial development and institutional quality relationship either. In general, the illustrative analyses show that there is no clear empirical evidence indicating that financial openness fosters growth through direct channels. This may explain why it has been so difficult to find a solid macro evidence supporting a strong and robust relationship between financial integration, financial development and growth although the underlying theory is so strong.

The purpose of the empirical analysis in this study is to re-examine the nature of the finance-growth nexus and to provide evidence if financial openness and financial development are beneficial for economic growth or not. Following the general approach in the literature, our baseline model involves regressing logarithm of real per capita GDP onto the measure of financial openness, financial development, and a set of non-financial control variables incorporating a threshold variable for institutional development.

The study employs three different econometric techniques to investigate the finance-growth relationship in an unbalanced panel data framework. The use of panel data techniques takes full advantage of time series variability in the sample along with the cross-sectional variability. We argue that there may exist indirect effects of financial openness and financial development on growth such that a certain level of institutional development may be a

[25] Rodrik and Subramanian (2008) argues that this fact is the key piece of evidence that has elicited a lot of analysis and that is the focus of the re-evaluation in Köse, Prasad, Rogoff and Wei (2006)

prerequisite to be able to derive growth benefits from finance. Hence, we exercise the estimation methods separately for institutionally under-developed and developed countries. Since the conventional measures of institutional quality such as rule of law, corruption, government effectiveness and transparency are obvious parts of the political regime characteristic, we choose to use *polity2* variable to proxy for institutional quality along with the degree of democracy (Cavallo and Cavallo, 2010). The value of 0 for *polity2* corresponds to a generous definition of democracy as noted by Persson and Tabellini (2008). Following their work, we determine *polity2=0* as the threshold variable and interpret positive values of *polity2* as an indicator of institutional development while the negative values as to stand for institutionally under-development.

Initially, a panel data fixed effects estimation is employed. In order to smooth out transitory or business-cycle fluctuations and to capture the long-run steady state relationship between the variables (Beck *et al.*,2000; Levine *et al.*, 2000; Beck, 2008; Bekaert *et al.*, 2009), the underlying annual data are averaged over 5-year non-overlapping intervals. On the overall sample, the results showed that the level of institutional development matters in order to derive growth benefits from financial openness while financial development promotes growth no matter what the degree of institutional development is. However, it would be better if the results are interpreted on the basis of country samples since each sub-sample has its own very distinct characteristic.

The analyses showed that there exists only a few institutionally underdeveloped industrial countries, hence the panel fixed effects estimation for this group is performed for all countries in the sub-sample. The results verified the Schumpeterian view that financial development can promote economic growth. The coefficient estimate of financial openness is also positive and significant with a rate of 6%. It is too small which is not surprising since nearly all of the industrial countries have already been largely integrated to the global markets. Hence a unit increase in financial openness do not have a major role for promoting growth in industrial countries.

For emerging countries, the fixed effects estimation results are noteworthy. It is seen that both financial openness and financial development accelerates growth regardless of the level of institutional development, however, the amount of growth benefits from financial openness doubles up when institutional development level surpasses the threshold. For institutionally underdeveloped emerging economies, a unit increase in financial openness leads to 40% increase in log real GDP, but as soon as the institutional development level passes the threshold, this amount becomes nearly 70%. Our results seem to take side of the notion that better developed financial markets and further financial openness spurs long-run economic growth in emerging countries no matter what the level of institutional development is. On the other hand, for other developing countries, the estimation results significantly differ between institutionally underdeveloped and institutionally developed countries. Neither financial openness nor financial development seem to have a long-term relationship with growth when countries are institutionally underdeveloped, while they both have positive significant effects, of approximately 70% each, on growth when countries are institutionally developed. Clearly, in order to receive growth benefits from financial integration and financial development, other developing countries must ameliorate their institutional development in the first place.

The eastern Europe countries are small economies, mainly remainings of old eastern block. Besides, due to the fact that there exists only three institutionally underdeveloped countries in this sample, the fixed effects estimation is performed using the whole sample of EE countries. For this sub-sample, the panel fixed effects estimation results again show that both financial openness and financial development spurs growth. Moreover, they do gain the most from financial depth since financial development measure has the largest estimate compared to other country groups. Consequently, panel data fixed effects estimation results tell us that both financial openness and financial development fosters economic growth but the level of institutional development is important in order to be able to derive benefits or increase the amount of benefits from financial openness and financial development.

Afterwards, we continue with panel autoregressive distirbuted lag (ARDL) modelling. Since the traditional method of time-averaging masks the dynamic relationship between the variables of the system, eliminates the useful opposite effects at different time periods and induces a loss of information; instead of time averaging the data, the short- and long-run effects of financial openness and financial development on growth is studied on annual data using a a panel error correction model. This enables us to study both the long-run effects and short-run dynamics jointly from a general autoregressive distributed-lag (ARDL) model. Moreover, a very prominent feature of panel autoregressive distributed lag (ARDL) approach to long-run modelling is that it is no longer necessary to pre-test if the variables of interest are I(0) or I(1) or mutually cointegrated. Another advantage of ARDL method is that estimation is possible even when explanatory variables are endogenous.

The PARDL estimation applied to whole sample points to an important conclusion. Financial openness is found to have positive and significant effect on growth for institutionally underdeveloped countries in the short-run; however, in the long-run, this significant impact turns out to be negative for growth. Thus, if a country is institutionally poor, increasing its financial openness may initially seem to promote growth but is risky in the long-run. But if the level of institutional development exceeds the threshold, then financial openness become a positive and significant growth determinant both in the short- and in the long-run. Hence, even if the long-run benefits have the potential of outweighing the short-run risks, countries must be cautious and manage institutional development before embracing financial openness. Financial development, on the other hand, is found to be insignificant in the short-run but have positive and significant long-run effects regardless of the level of institutional development. Note that, the estimated long-run coefficient of the financial development increases significantly for institutionally developed countries compared to the other. The ECT coefficient is remarkably small for institutionally underdeveloped countries which means the system will hardly return back to equilibrium after a shock hits. On the contrary, for institutionally developed countries the system could reach back to equilibrium in about 3 and a half years after a shock.

According to the panel ARDL estimation, the finance-growth nexus in industrial countries is positive and significant both in the short- and in the long-run. Although the short-run effect of financial depth is petty with a rate of 0.06, it reaches to 0.5 in the long-run. Nonetheless, financial openness has positive, significant but moderate effect on growth both in the short- and in the long-run for advanced ecoonomies. The panel ARDL specification of emerging countries also imply that financial development and financial openness have enhancing growth effects apart from the level of institutional development. Both short-run and long-run coefficient estimates of financial openness are significantly positive for institutionally under-developed and well developed emerging countries. To this reason we can claim that financial openness has direct growth effect in emerging economies. For institutionally developed emerging countries, one result is prominent: financial development is negative and significant in the short-run, however it turns out to be largely positive and significant in the long-run. Coexistence of this positive long-run and negative short-run effects of financial development on growth can be explained with "short run pain, long-run gain" motto as Kaminsky and Schmukler (2003) stated. The financial development usually follows financial openness and financial openness has its short-run cost in developing countries who want to move on to a higher growth path.

As in panel fixed effects estimation, panel ARDL specification of ODCs also points to the importance of institutional development for finance-growth relationship. In the short run, financial openness seem to have positive and significant effect on growth regardless of the institutional development. Nevertheless, the long-run results are severe such that financial openness has negative effect on growth for institutionally poor ODCs. This implies that an increase in financial openness with underdeveloped institutions tends to decrease ODC's log real GDP by approximately 40%. Though, if ODCs are institutionally developed their long-run benefit from financial openness is nearly 60%. In means of financial development, it is seen that financial depth is not statistically significant in either long- or the short-run for institutionally underdeveloped ODCs. However, financial development exerts positive and significant impact on economic growth in the long-run, and still insignificant in the short-run for institutionally developed ODCs. Accordingly, these results imply that ODCs

should first of all focus on long-run policies for upgrading institutional development level in order to benefit from financial development and financial integration.

As a noticeable result, the PARDL estimation shows that except other developing countries, economic growth is positively and significantly linked to the measures of financial openness and financial development in the long-run regardless of the level of the institutional development. However, when a country is institutionally well-developed its growth benefits from finance considerably increases. Henceforth, this study find evidence in favor of the supply-leading view of financial development in the long-run for industrial, emerging and eastern Europe countries. For ODC's the results change as the level of institutional development changes. ODCs must reach to the threshold value in order to be able to derive growth benefits from financial openness and financial development in the long-run.

Further, the panel ARDL approach to long-run modelling is performed considering different income levels of countries in order to investigate the long- and short-run dynamics of the growth determinants and compare them between high income, middle income and low income countries. The findings show that a positive and significant relationship between financial openness and growth coexists both for long- and short-run for high and middle income countries, while for low income countries it is negative or at best insignificant. Besides, the 42% estimate for financial integration is the greatest among income groups hence we can claim that middle income countries derive more growth benefits as their financial integration expands. The long-run estimate for financial depth also is positive and significant for high and middle income countries, yet it is insignificant for growth for low income countries. Interestingly, the estimated financial development coefficients do not differ from each other very much for high and middle income countries. On the other hand, short-run dynamics act differently. Financial development is positively and significantly related to growth for high income countries in the short-run while it is totally insignificant for middle and low income countries.

Other than panel ARDL estimations, the generalized method of moments (GMM) procedure, developed for dynamic panel data models by Arellano and Bond (1991) and Arellano and Bover (1995) is applied to handle the potential simultaneity and thus endogeneity problem of the explanatory variables. The results of the dynamic GMM estimation are consistent with the previous findings on the overall and for each sub-sample. The industrial countries do derive growth benefits from financial openness and from financial development in moderate amounts. Financial openness fosters growth in emerging countries whether they are institutionally developed or not, but the amount of this benefit becomes 90% from 50%, i.e., twice larger, when their institutonal quality is above threshold level. Financial development requires higher institutional development in order to exert positive growth effects in emerging economies. The dynamic GMM results for other developing countries repeat that the level of institutional development matters in order to derive growth benefits both from financial openness and financial development. Neither financial openness nor financial development is significant for economic growth for institutionally underdeveloped ODCs. On the contrary, both financial depth and financial integration become meaningful positive determinants of growth as long as the level of institutional development is higher than the threshold.

Since the empirical framework of this study is interested if threshold effect of institutional development behaves as a collateral channel spurring growth especially for emerging and other developing countries, we attempt to explain if financial openness, financial development, and additionally, their interaction with institutional development are significant or not. Two new interaction variables are defined and dynamic GMM is re-exercised. The findings validates our previous findings. It is seen that the level of development doesn't matter for financial openness and financial development spurring growth in emerging economies. Both variables effect economic growth positively and significantly in emerging countries regardless of the institutional quality. Even so, the amount of the effect increases when an emerging country achieves to reach or pass above the threshold level for institutional development. On the other hand, for other developing countries, financial openness is not a significant element for growth process if the country is institutionally underdeveloped. Financial openness enhances growth in a positive manner provided that the institutional development is above the predetermined threshold value of 0. However, for other developing

countries, financial development do have positive and significant effects on economic growth no matter what the level of institutional development is. Hence, for ODCs, the difference is significant in means of financial openness and growth, yet not for financial development.

As a result, the findings of this study favor a positive finance-growth nexus and point to the importance of institutional development. The main conclusion of the study posits that the reasons to the inconclusive findings and the absence of a robust evidence in the literature may due to the selection of different country groups with different economic development levels and, more importantly, due to the possible nonlinearity arising from indirect channels. The absence of a robust evidence so far should not lead to the idea that financial openness carries only great risks but no benefits, and our analyses support the notion that the indirect benefits of financial integration, which are hard to derive from standard linear models, could be quite important since the relationship between financial development, financial openness and growth is significantly changing according to the level of institutional development.

On the empirical front, our findings clearly indicate that the threshold level of institutional development is an important determinant of the relationship between finance and growth in the overall. It is an important conclusion that the relatively young and rapidly growing emerging economies benefit the most from international financial integration without any prerequisites or preconditions. On the other hand, developing economies should be cautious since financial openness may hinder growth and lead to severe consequences unless institutional development is healed before financal openness policies take speed. That is, financial openness combined with quality institutions and stable governance is significant for developing countries to derive growth benefits from financial integration. From the point of financial development, the empirical results of this study suggest that, by and large, financial development fosters growth. The indirect channel of transmission from financial development to economic growth, however, is again the level of institutional development especially in developing countries.

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APPENDICES

APPENDIX A: Data Source

All data are collected in annual frequency.

Variable	Source
Gross Domestic Product (GDP)	World Bank; World Development Indicators
Gross de facto Financial Openness	"The External Wealth of Nations" dataset by Lane and Milesi-Ferretti (2007). Data available at http://www.philiplane.org/EWN.html
Liquid Liabilities/GDP	World Bank; "Financial Structure" dataset by Beck and Demirgüç-Kunt (2009)
Trade/GDP	World Bank; World Development Indicators
Government Consumption/GDP	World Bank; World Development Indicators
Inflation	World Bank; World Development Indicators
Secondary School Enrollment	"International Measures of Schooling Years and Schooling Quality" dataset by Barro and Lee (2010) Data available at http://www.cid.harvard.edu/ciddata/ciddata.html
Polity2	Stock Data from POLITY IV Project, Marshall *et. al* (2009)
Insqual	World Bank Policy Research; "Governance Matters VIII: Governance Indicators for 1996-2008" dataset by Kaufmann, Kraay and Mastruzzi (2009)

APPENDIX B: Country Samples and World Bank Country Codes

The sample comprises of 105 countries; 24 industrial, 24 emerging, 43 other developing and 14 eastern Europe

Table B1. Sample of Countries

Industrial	Emerging	Other Developing	Eastern Europe
Australia (AUS) Austria (AUT) Belgium (BEL) Canada (CAN) Denmark (DNK) Finland (FIN) France (FRA) Germany (DEU) Greece (GRC) Hong Kong (HKG) Iceland (ISL) Ireland (IRL) Italy (ITA) Japan (JPN) Malta (MLT) Netherlands (NLD) New Zealand (NZL) Norway (NOR) Portugal (PRT) Spain (ESP) Sweden (SWE) Switzerland (CHE) United Kingdom (GBR) United States (USA)	Argentina (ARG) Bolivia (BOL) Brazil (BRA) Chile (CHL) Colombia (COL) Costa Rica (CRI) Egypt (EGY) India (IND) Indonesia (IDN) Israel (ISR) Jordan (JOR) Korea, Rep. of (KOR) Malaysia (MYS) Mexico (MEX) Pakistan (PAK) Peru (PER) Philippines (PHL) Poland (POL) Russia (RUS) Singapore (SGP) South Africa (ZAF) Thailand (THA) Turkey (TUR) Venezuela (VEN)	Algeria (DZA) Bangladesh (BGD) Cambodia (KHM) Cameroon (CMR) Cape Verde (CPV) Central African Rep. (CAF) Chad (TCD) Dominican Rep. (DOM) Ecuador (ECU) El Salvador (SLV) Ethiopia (ETH) Fiji (FJI) Gambia, The (GMB) Ghana (GHA) Guatemala (GTM) Haiti (HTI) Honduras (HND) Jamaica (JAM) Kenya (KEN) Malawi (MWI) Mali (MLI) Mauritius (MUS) Mongolia (MNG) Morocco (MAR) Mozambique (MOZ) Nepal (NPL) Niger (NER) Nigeria (NGA) Paraguay (PRY) Saudi Arabia (SAU) Senegal (SEN) Sierra Leone (SLE) Solomon Islands (SLB) Sri Lanka (LKA) Sudan (SDN) Syrian Arab Republic (SYR) Tanzania (TZA) Togo (TGO) Trinidad &Tobago (TTO) Tunisia (TUN) Uganda (UGA) Uruguay (URY) Zambia (ZMB)	Albania (ALB) Bulgaria (BGR) Croatia (HRV) Czech Rep. (CZE) Estonia (EST) Hungary (HUN) Latvia (LVA) Lithuania (LTU) Macedonia (MKD) Moldova (MDA) Romania (ROM) Serbia (SRB) Slovak Rep. (SVK) Slovenia (SVN)

APPENDIX C: Lag Selection For Panel ARDL Estimation

	All Countries		
Lag	**AIC**	**SIC**	**HQ**
0	-6.5601	-6.5313	-6.5493
1	-7.8831	-7.6529	-7.7965
2	-8.1145	-7.6832*	-7.9526*
3	-8.1538	-7.5209	-7.9158
4	-8.2014*	-7.3670	-7.8877
	Industrial Countries		
Lag	**AIC**	**SIC**	**HQ**
0	-12.1943	-12.1289	-12.1685
1	-14.5001	-13.7237	-14.2938
2	-14.7040	-13.9773*	-14.3172*
3	-14.6945	-13.2567	-14.1272
4	-14.8506*	-12.9553	-14.1027
	Emerging Countries		
Lag	**AIC**	**SIC**	**HQ**
0	-6.3445	-6.2712	-6.3157
1	-7.2836	-6.3871	-7.0493
2	-7.4932	-6.6936*	-7.0540*
3	-7.4929	-5.8706	-6.8486
4	-7.5168*	-5.3782	-6.6675
	Other Developing Countries		
Lag	**AIC**	**SIC**	**HQ**
0	-6.9947	-6.9424	-6.9744
1	-7.8495	-7.2377	-7.6864
2	-8.0224*	-7.4310*	-7.7166*
3	-7.9831	-7.2377	-7.5346
4	-7.9552	-6.8323	-7.3640
	Eastern Europe Countries		
Lag	**AIC**	**SIC**	**HQ**
0	-4.5265	-4.3825	-4.4681
1	-5.7542	-4.0011	-5.1134
2	-5.8732*	-4.7461*	-5.3450*
3	-5.7857	-3.0495	-4.6752
4	-5.4485	-1.8483	-3.9874

APPENDIX D: Robustness Check Through Alternative Measures For Financial Development and Institutional Development

In order to check the robustness of the findings of the study, an alternative measure of financial development, denoted by **PC**, which captures the credit allocation side of the financial system is also used. Private Credit by Deposit Money Banks to GDP (**PC**) equals to the claims on the private sector by deposit money banks divided by gross domestic product (Beck, Demirgüç-Kunt and Levine, 2000). Each estimation is re-exercised using PC variable and the results yield exactly the same conclusions on interest variables with slight differences on control variables.

Another consistency check is employed in terms of institutional development. An indicator is created using six dimensions of Governance Indicators based on Kaufman *et al.* (2008) dataset. This indicator, denoted by "***insqual***", is the simple yearly average of this six governance indicator for each country. In other words, an average level of institutional quality of a country based on World Governance Indicators dataset (Kaufman *et al.,* 2008). A level of 0.5 is found to be consistent with the predetermined threshold value of *polity2=0*. Hence estimations are carried over three categories, one for the countries with *insqual* less than 0.5 (poor institutional quality); one for *insqual* greater than 0.5 (good institutional quality); and one for *insqual* being in between -0.5 and 0.5 (moderate institutional quality). Since this variable is only available from 1996, the panel fixed effects estimation is re-exercised through 1996-2007 and the results yield the same conclusions on interest variables for developing countries.

Table.D.1. Panel Fixed Effects Estimation Using an Alternative Financial Development Variable (PC)

	ALL		**IND**	**EMG**		**ODC**		**EE**
	Institutionally Underdeveloped	Institutionally Developed		Institutionally Underdeveloped	Institutionally Developed	Institutionally Underdeveloped	Institutionally Developed	
FO		0.0418 [0.00323]	0.0115 [0.03131]	0.3690 [0.07306]	0.6224 [0.18931]		0.3988 [0.19529]	0.2063 [0.05270]
PC	0.4529 [0.26006]	0.6013 [0.07707]	0.4358 [0.06870]	0.8598 [0.4300]	0.5645 [0.21584]		0.8804 [0.37133]	0.5473 [0.11116]
TO	1.0359 [0.24623]	0.7820 [0.10145]	0.9104 [0.17933]		0.2320 [0.19884]	1.1374 [0.22697]	0.8646 [0.20043]	
GOV	-0.0170 [0.00984]		0.0220 [0.00837]			-0.0195 [0.00902]		-0.048 [0.01057]
INF			-0.8455 [0.24444]					-0.0768 [0.03849]
SEC	0.0514 [0.00435]	0.0126 [0.00186]	0.0057 [0.00189]	0.0575 [0.01207]	0.0257 [0.00515]	0.0534 [0.00454]	0.0094 [0.00473]	
Constant	2 [0.25039]	25.4672 [0.10763]	25.5567 [0.18949]	23.7232 [0.5326]	26.4555 [0.20199]	24.3084 [0.22132]	23.4216 [0.19284]	26.2371 [0.21931]
Log Initial Income	-0.0001 [0.00741]	-0.0075 [0.00373]	-0.0015 [0.00609]	0.0077 [0.01724]	-0.0103 [0.00674]	0.0028 [0.00740]	0.0020 [0.00613]	-0.0058 [0.00338]
N	40	67	23	7	17	27	26	14
NxT	155	327	153	26	87	142	92	52
Adj-R^2	0.66	0.65	0.78	0.89	0.77	0.66	0.61	0.82

Table.D.2. Long-run Estimation Using an Alternative Financial Development Variable (PC)

	ALL		IND	EMG		ODC		EE
	Institutionally Underdeveloped	Institutionally Developed		Institutionally Underdeveloped	Institutionally Developed	Institutionally Underdeveloped	Institutionally Developed	
FO		0.0770 [0.01846]	0.0454 [0.01524]	0.4458 [0.03763]	0.5572 [0.09702]		0.3370 [0.08855]	0.1655 [0.03917]
PC	0.4924 [0.08313]	0.6401 [0.03370]	0.4557 [0.03119]	0.8895 [0.14962]	0.6278 [0.09398]		0.6927 [0.17185]	0.6685 [0.05890]
TO	0.1737 [0.06887]	0.5955 [0.04209]	0.8135 [0.06568]		0.1618 [0.09561]	0.7182 [0.07317]	0.4654 [0.07592]	0.3165 [0.07034]
GOV	-0.0232 [0.00306]		0.0236 [0.00334]			-0.0162 [0.00300]	-0.0061 [0.00257]	
INF	-0.1011 [0.04675]		-0.5981 [0.08445]				-0.0921 [0.00055]	-0.0242 [0.01009]
SEC	0.0531 [0.00217]	0.0155 [0.00087]	0.0063 [0.00086]	0.0440 [0.00431]	0.0335 [0.00252]	0.0571 [0.00197]	0.0150 [0.00221]	
Constant	25.4854 [0.06616]	25.2987 [0.03450]	25.4897 [0.06330]	24.9880 [0.12324]	26.1978 [0.06430]	24.5475 [0.04782]	23.5882 [0.06993]	25.1616 [0.06517]
N	40	68	23	9	18	28	24	14
NxT	533	1428	666	125	359	652	361	199
Adj-R^2	0.72	0.69	0.72	0.79	0.75	0.66	0.61	0.79

Table.D.3. Short-run estimation for PARDL(2,2) Using an Alternative Financial Development Variable (PC)

	ALL		**IND**	**EMG**		**ODC**		**EE**
	Institutionally Underdeveloped	Institutionally Developed		Institutionally Underdeveloped	Institutionally Developed	Institutionally Underdeveloped	Institutionally Developed	
ECT	-0.0834 [0.01568]	-0.0235 [0.00499]	-0.0287 [0.00704]	-0.0496 [0.02373]	-0.0124 [0.00911]	-0.0519 [0.01047]	-0.0496 [0.01471]	-0.0059 [0.02741]
Δy_{t-1}	0.2257 [0.04496]	0.1724 [0.02625]	0.3077 [0.03631]	0.3620 [0.09296]	0.2658 [0.05303]	0.0676 [0.03994]		0.3511 [0.06028]
ΔFO_{t-1}	0.0959 [0.04789]	0.0464 [0.00858]	0.0237 [0.00501]	0.0457 [0.02804]	0.1561 [0.02670]		0.0657 [0.03582]	0.0459 [0.02053]
ΔFD_{t-1}					-0.0889 [0.03991]			
ΔTO_{t-1}			-0.0151 [0.01987]			0.0517 [0.03025]		
ΔGOV_{t-1}	0.041 [0.00143]							
ΔINF_{t-1}			-0.0653 [0.01994]					
ΔSEC_{t-1}						0.0084 [0.00355]		
Constant	0.0278 [0.00279]	0.0249 [0.00121]	0.0182 [0.00132]	0.0356 [0.00698]	0.0282 [0.00302]	0.0266 [0.00269]	0.0307 [0.00221]	0.0253 [0.00352]
N	40	68	23	9	18	28	24	14
NxT	519	1390	645	123	343	635	354	184
Adj-R^2	0.23	0.22	0.28	0.24	0.21	0.18	0.16	0.38
DW	2.09	1.88	1.95	1.91	1.99	2.02	1.79	2.06

Table.D.4. Dynamic GMM Estimation Using an Alternative Financial Development Variable (PC)

	IND	**EMG**		**ODC**		**EE**
		Institutionally Underdeveloped	Institutionally Developed	Institutionally Underdeveloped	Institutionally Developed	
FO	0.0294 [0.01236]	0.2671 [0.12616]	0.6315 [0.10198]		0.7910 [0.08360]	0.3056 [0.03564]
PC	0.4247 [0.04334]	1.6762 [0.66671]	0.8359 [0.12102]		1.0274 [0.29676]	0.5641 [0.07090]
TO	0.6863 [0.09547]			0.7325 [0.07684]	0.6071 [0.07772]	
GOV	0.0383 [0.00437]			-0.0130 [0.00637]	-0.0071 [0.00889]	-0.0159 [0.0039]
INF	-0.6710 [0.25441]				0.3341 [0.13830]	
SEC	0.0048 [0.00131]	0.00356 [0.01177]	0.0334 [0.00116]	0.0686 [0.00351]	0.0066 [0.00229]	
Log Initial Income	0.0040 [0.00473]	-0.0193 [0.02581]	-0.0123 [0.00361]	-0.0010 [0.00469]	0.0009 [0.00217]	-0.0064 [0.00209]
N	23	7	18	26	23	14
NxT	130	23	77	133	68	38
m2	0.521	0.303	0.385	0.410	0.562	0.841
Sargan	0.079	0.237	0.115	0.966	0.098	0.125

Table.D.5. Fixed Effects Estimation Using Alternative Institutional Quality Variable (INSQUAL)

	EMG		
	Insqual < 0.5 (Middle Institutional Quality)	Insqual > 0.5 (High Institutional Quality)	-0.5 < Insqual < 0.5 (Moderate Institutional Quality)
FO	0.5224 [0.07299]	0.2807 [0.06427]	0.4736 [0.07880]
FD		0.3403 [0.15887]	
TO		0.0025 [0.00045]	
GOV		0.0341 [0.01317]	
INF	-0.0029 [0.00066]	-0.00781 [0.00249]	-0.0024 [0.00096]
Constant	27.7419 [0.04186]	26.4652 [0.21254]	29.0588 [0.04294]
N	21	13	10
NxT	204	60	64
Adj-R^2	0.50	0.80	0.51

APPENDIX E: CIRRICULUM VITAE

Personal Information

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Education

Degree	Institution	Year of Graduation
MS	METU Statistics	2003
BS	METU Statistics	2000
High School	Özel Arı Lisesi, Ankara	1995

Work Experience

Year	Place	Enrollment
2010	Beykent University, Istanbul	Control Chief
2000-2008	METU Department of Statistics	Research Assistant
1999 August	Turkish Treasury	Intern

Foreign Languages

Advanced English, German

Publications

1. AKGUN B(2007), The Effects of Exchange Rate Volatility on Turkey's Export Volume: An Empirical Investigation. Proceedings of The 5th Statistical Congress, Antalya

2.AKGUN B(2007), Identification of periodic Autoregressive Moving-Average Models. Proceedings of The 5th Statistical Congress, Antalya

Projects

1.Short Term Consultant for UNDP in Project for Development of Practice of Mediation in Criminal Justice System of Turkey (March 2010)

2.Consultant/Analyst for Baku-Tiflis-Ceyhan Energy Household Evaluation Project employed by ISTEM HR RESEARCH & TECHNICAL SERVICES (December 2009)

3.Short Term Consultant for UNDP in RVRP Project (July 2009)

4.Project Consultant and Analyst for EGEPLAN&MODUL in cooperation with Ministry of Environment and Forestry (July 2006)

5. Project Consultant and Coordinator(Ankara Base) for ANAR Arastirma & Co. in the social project "ÖSYS Derecesi Alan Öğrencilerin Üniversite Tercih ve Eğilimlerinin Değerlendirilmesi"

Research Interests

Time Series Econometrics, Macroeconometrics, Linear Models, Panel Data, Financial Econometrics, Volatility Modelling, Finance and Growth

Hobbies

Pilates, Blogging, Design, Literature, Movies, Travel

APPENDIX F: TURKISH SUMMARY

Ekonomik literatürde, günümüzde artan sermaye akışı ortamında, iyi işleyen bir ekonomiye, iyi düzenlenmiş, birikimleri yatırıma dönüştüren bir finansal yapıyla ulaşılacağı savunulmaktadır. Bir finansal yapı bankacılık, para piyasaları , senetler, emeklilik ödemeleri, sigorta şirketleri ve diğer aracı ve düzenleyiciler ile bu piyasaları değerlendirip denetleyen kuruluşlardan oluşmaktadır. Finansal sistemin, borç veren ve alanların taleplerinin karşılanması, kaynaklara hareket kazandırılması ve bu kaynakların verimli bir şekilde üretken sektörlere yönlendirilmesi aşamalarında hayati önemi vardır. Bu sebeple sağlam bir finansal yapının kalkınma ve ekonomik büyümeyi sürdürme noktasında vazgeçilmez olduğu ve bu yapının entegrasyonunun gerekliliği açıktır.

Joseph Schumpeter'in 1911'de "*Toplumun birkimlerini kimin kullanacağına karar vermeleri sebebiyle, aracı finansal kuruluşlar piyasada belirleyici konumdadır*." görüşüyle özetlediği incelemesi yine bu görüşü desteklemektedir (Schumpeter, 1934) . Sağlam bir finansal yapının iyi bir ekonominin temelini atmada önem taşımasına ve kalkınma politikalarının finansal iyileşme hedeflerini aşmaması gerektiğinin bilinmesine rağmen görüşleriyle piyasaya yön veren ekonomistler finans-büyüme ilişkisinde görüş ayrılıklarına sahiptir. Finans ve büyüme arasındaki güçlü ilişkinin bilinmesine rağmen bu ilişkiye yön veren ana kuvvetler tam anlamıyla çözümlenmiş değildir. Finansal gelişme büyümenin temel koşullarından biri midir, yoksa yalnızca kalkınmanın yan ürünlerinden biri midir? Bir yanda "kalkınma ekonomisinin öncüleri" addedilen 3 önemli ve Nobel ödüllü ekonomistin de içinde bulunduğu bir derlemede finansdan hiç bahsedilmemiştir (Meier ve Seers ,1984). Lucas (1988), finansın rolününün gereğinden fazla öne çıkartıldığını ifade etmiş ve onu büyümeyi etkileyen ana etmenler altında değerlendirmemiştir. Hatta Levine (1988) ve Stern (2003)'in kalkınma ekonomisi üzerine incelemelerinde, finans, çıkarılan başlıklar arasında dahi yer almamıştır. Bu ekonomistler finansın büyümeye sebep olmadığı, esasen reel sektörden gelen taleplere kendiliğinden cevap veren bir sistem olduğunu savunmuşlardır. Diğer taraftan Levine (2003) ve Nobel ödüllü Merton Miller (1988) finans piyasalarının ekonomik büyümeye katkısının önemle incelenmesi gereken bir konu olarak ele almışlardır. Aynı şekilde Bagehot (1873), Schumpeter (1911), Gurley ve Shaw (1955), Goldsmith (1969) ve McKinnon (1973) ekonomik büyümenin dinamikleri tam ve kesin olarak anlaşılmadan

finans-büyüme düğümünün bir kenara bırakılabileceği fikrinin (Levine, 2003) karşısında durmuşlardır.

Konuyu daha geniş bir açıdan ele aldığımızda , finans ve büyüme ilişkisinde dört genel görüş hakimdir. Bunlardan ilki arzın yön verici kuvvet olarak finansal iyileşmenin ekonomik büyümeye pozitif etkisinin olduğu arz ağırlıklı görüştür. Talep odaklı görüş ise Robinson'un (1952) ileri sürdüğü "girişim öncülük ettiğinde finans arkasından gelir" ifadesi ile finansın reel sektördeki kıpırdanmalara cevap verdiğini savunur. Bu görüşlerin ortasında kalan ise finans ve ekonomik büyümenin ortak etkisi bulunduğunu savunan dengeleyici konumdaki görüştür. Bunlardan sonuncusu ise esasen finans ve büyüme arasında hiçbir ilişkinin olmadığının savunulduğu görüştür (Apergis, Filippidis, Economidu, 2007)

Teoride finans ekonomik büyümeye nasıl katkı sağlamaktadır? Ekonomistlerin farklı önem dereceleri belirlemelerine rağmen, finansal gelişmişliğin uzun dönem ekonomik büyümeye katkısı teoride kabul edilmiştir: finans sektörünün gelişmişliği ekonomik büyümeyi arttırmanın yanısıra bir kriz ortamında piyasanın kırılganlığını da azaltmaktadır. Caballero ve Krishnamurthy (2001); Agion, Baccheta, Banerjee (2004); Mendoza, Quadrini ve Rios-Rull (2007); Agio,Benigno ve Kiyotaki (2007), finansal gelişmişlik olmadan gerçekleşen finansal liberalizasyonun, yerli ve uluslararası müşterek kısıtların etkileşimi sonucu tahmin edilmesi güç ve zararlı yan etkilerinin gerçekleşeceğini farklı teorik koşullar altında sunmuşlardır (Köse,2009).

İlk nesil neoklasik büyüme modelleri, ekonomik büyümeyi dışsal teknik değişkenlere ve nüfus artışına atfeder (Solow, 1956, 1957), son yıllardaki literatürde ise finansın gelişmekte olan ülkelerin ekonomik büyümesinde kilit bir rol oynadığı görüşü yaygındır (Levine, Demirgüç-Kunt, 2001; Evans *et al.*, 2002) . Endojen büyüme teorisi ise efektif bir finansal sistemin, bilgi asimetrisi ve işlem bedeli gibi pek çok sebepten oluşan piyasa sürtünmelerini azaltarak, ekonomik büyümeyi çok çeşitli kanallardan besleyeceğini söyler. Buna ek olarak , finansal gelişmenin ekonomik büyümeye etki ettiği iki ana kanal daha vardır, bunlar sermaye akışı ve Toplam Faktör Verimliliği (TFV)dir. Sermaye akış kanalı, bu aynı zamanda kantitatif kanal olarak da bilinir, finansal sektörün birikim mobilizasyonu aracılığıyla bölünemezliği aşmak becerisine odaklanır. Kalitatif kanal olarak da bilinen TFV ise finansal gelişmenin bilgi asimetrisini

azaltma rolüne vurgu yapar (Townsend 1979 ; Greenwood ve Jovanovich 1990 ; King ve Levine 1993b, Ang 2008). Finansal gelişme makroekonomik istikrar üzerinde de doğrudan bir etkiye sahiptir. Ksağlıklı bir finansal sistemden yoksunluk sermaye akışının yönünde ani değişikliklerle karşılaşan gelişmiş ülkelerdeki genişleme-daralma çevrimlerini kötüleştirir (Caballero ve Krishnamurty, 2001; Aghion ve Banerjee, 2005) ve finansal açıklıkla bağıntılı krizlere yol açar (Mishkin, 2006).

Levine (2003)'a göre finansal gelişme (i) girişimler ve muhtemel yatırımlar hakkında öncül bilgi üretimi ve sermayenin efektif tahsisi, (ii) yatırımların takibi ve kurumsal denetim sağlanması, (iii) ticaret, çeşitleme ve dönemler arası risk yönetimi, (iv) birikimlerin mobilitesi ve havuzlandırılması ve (v) mal ve hizmet takasının kolaylaştırılmasındaki gelişmeleri içerir.

Finansal piyasa ve kurumlar olmadan tasarruf sahipleri birikimlerini çok geniş sayıdaki girişimciler tarafından sağlanan uzun dönem riskli projelere yatırmaktansa bir kenarda alıkoymayı tercih edeceklerdir. Çünkü bu tür projeleri risk ve getiri açısından değerlendirmek yatırımcı için zor ve maliyetlidir. Finansal sistemler hem yatırımlar hakkındaki bilgi maliyetini asgariye indirmekte ve hem de düzenli performans analizini ve takibini yapmaktadırlar. Üstelik, gelişmiş bir finansal sistem kaynakların verimli tahsisini de sağlamaktadır. Pek çok model yatırımcının piyasa koşulları hakkında doğru bilgiye sahip olduğunu farzederek sermayenin en karlı firmalara akma eğilimi gösterdiğini varsayar (Bagehot, 1873, Ang'dan alıntı, 2009). Oysa ki, pratikte, bireysel yatırımcının piyasa koşulları ve olası yatırımlar hakkında bilgi toplama, işleme ve üretme yetisi olmayabilir ve bu nedenle bilginin yüksek maliyeti sermayenin maksimum değerinde kullanılabileceği yere akışını engelleyebilir. Sermayenin kıt olduğu ortamda, doğru bilgi üreten aracı kuruluşlar sermaye tahsisini en efektif düzeyde yaparak umut veren kurumlara kaynak sağlayacktır (Greenwood and Jovanovic, 1990). Bunu takiben, yatırımların kalitesindeki artış ekonomik büyümeyi hızlandırabilir. En iyi yatırım olanaklarının tespitinin yanı sıra , finansal aracılar yeni ürün ve üretim süreçleri geliştirmede en olası girişimcileri belirleyerek teknolojik innovasyonun hızını da arttırabilir (King ve Levine, 1993b).

Finans sisteminin diğer bir rolü yatırım projelerinin takip maliyetlerini azaltmaktır. Bunu daha derinleştirecek olursak , standart aracı teorisi kurumsal yönetim problemini özsermaye ve borç sahiplerinin yöneticileri nasıl sermaye sağlayıcıların çıkarları doğrultusunda davranmaya ittiği temelinde tanımlar (Levine, 2005). Finansal düzenlemelerin yoksunluğu durumunda, kurumsal yönetim farklı aracılardan sağlanan birikim mobilizasyonunu aksatabilir ve böylelikle sermayenin karlı yatırımlara akışını engelleyebilir ya da yöneticiler yetkilerini sermayenin firmadansa kendi çıkarlarına olacak projelere akışını sürdürmek için kullanabilir (Levine, 2005). Tüm bunlar, elbette, etkin kaynak tahsisini zedeleyecektir. Bu finansal kontrat ve sözleşmeler, birikimlerin ya da sermayenin karlı yatırımlara yönlendirilmesini garantilemektedir. Finans piyasalarının ve kurumlarının kurumsal yönetimi, sermaye birikimini, kaynak tahsisini ve uzun dönem büyümeyi nasıl geliştirebileceği üzerine literature Shleifer ve Vichny (1997) tarafından gözden geçirilmiştir.

Etkin finansal sistemler yatırımcıların portföylerini çeşitlendirmelerine ve riske karşı kaldıraç olanakları sunmaya yardımcı olur. Levine (2004) bu konuyu üç kategoride ele almıştır: yatay kesit risk çeşitlemesi, dönemlerarası risk paylaşımı ve likidite riski. Finansal sistemler riskin takası, havuzlanması ve çeşitlendirilmesi için araçlar sunduğundan bu servisler kaynak tahsisi ve birikim oranlarını alternatifleyerek uzun dönem büyümeyi etkileyebilir. Acemoglu ve Zilibotti (1997) çalışmalarında yüksek getirili ve riskli yatırımların genellikle bölünmez olduğuna ve büyük bir başlangıç sermayesi gerektirdiğine, birikim sahipleri riskten hoşlanmdığına fakat bunun yanında sıfır riskli projeler getiri bakımından zayıf olduğuna, ve haliyle sermayenin kıt kaldığına dikkat çekmiştir. Sonuç olarak, finansal sistemler aracıların riskli projelerin çeşitlendirilerek riskinin azlatıldığı portföyler tutmasını sağlar ve bu şekilde toplumun daha yüksek getirili projelere yatırım yapmasını motive eder. Bu yatırımların elbette uzun dönem büyüme üzerinde pozitif etkileri bulunmaktadır. Teori, yatay kesit risk paylaşımı ve büyüme arasındaki ilişkiyi aracılar üzerinden değerlendirmektense finans piyasalarının rolü üzerine odaklanmaktadır.

Birikimlerin hareketlendirilimesi ve finansal gelişme arasındaki ilişki literatürde daha az ilgi görmüştür. Bir ortak problem gelişmekte olan ve zayıf finansman ortamına sahip ülkelerde birikim ve yatırım uyumsuzluğu diğer bir deyişle üretime etki edecek

sermaye yetersizliği olarak ortaya çıkmaktadır. Eğer bu ortamda finansal aracılar itibar kazanıp yatırımcıdan rağbet görürse yine sermaye akışı ve ekonomiyi büyütecek koşul oluşmuş olur. Yeterince gelişmemiş, zayıf finansal sektöre sahip gelişmekte olan ülkelerde görülen ortak problem birikim ve yatırım arasındaki eşleşmeme, bir başka deyişle verimli sermayeye yatırımım yoksunluğudur. Finansal sistemler genişledikçe ve aracılar sağlam bir reputasyona kavuştukça daha çok fon yatırım için kullanılabilir hale gelecektir. Kısacası, bireysel birikimlerin havuzlanmasında daha verimli olan finansal sistemler ekonomik kalkınmayı derinlemesine etkileyebilir.

Ticari işlemler kredi teklifleri ve ödeme garantileri aracılığı ile kolaylaştırılmaktadır. Döviz, uzman işgücü ve innovasyon arasındaki ilişkiler Adam Smith'in (1776) "Ulusların Zenginliği" başlıklı çalışmasının çekirdek elemanlarıdır. Yazar, verimliliğin geliştirilmesinin altında yatan temel prensibin spesializasyon olduğunu söyler. Daha fazla özelleşmenin daha çok ticari işlem gerektirdiğini ve her ticari işlem maliyetli olduğundan, ticari işlem maliyetlerini düşüren finansal anlaşmalar özelleşmeyi, teknolojik inovasyonu ve haliyle büyümeyi teşvik edeceğini belirtir.

Ekonomistler geçtiğimiz yüzyıl boyunca finansal gelişmenin ekonomik kalkınmada neden-sonuç etkisi olup olmadığını araştırdılar. İlk olarak Goldsmith (1969) finansal gelişme ve kişi başına düşen GSYH arasında pozitif bir korelasyon olduğunu ampirik olarak göstermiştir. Geleneksel ekonomi teorisi daha gelişmiş bir finansal sektörün kaynakların tahsisi, takibi, daha az bilgi asimetrisi ve haliyle daha yüksek büyüme ve daha düşük ekonomik volatilite için verimli bir zemin sağladığını varsayar. Pek çok çalışma uluslararası finansal entegrasyonun, özellikle toplam faktör verimliliği üzerinden (Prasad, Rajan, 2008; Stulz, 2005) büyümeyi artıran finansal gelişmişlik gibi pek çok ikincil faydaları olduğunu göstermiştir (Köse, Prasad, Rogoff, Wei, 2006). Bir o kadarı da finansal gelişmişlikte belli bir düzeyin, finansal açıklıktan büyüme faydası sağlayabilmenin önkoşulu olduğunu iddia etmektedir.

Finansal açıklıkla ilgili en önemli sorulardan biri uzun dönem büyümeyi arttırıp arttırmadığı, ve eğer arrtırıyorsa, sağladığı faydaların getirdiği risklerden ağır basıp basmadığıdır. Dünya Bankası , Uluslararası Yardım Fonu (IMF) ve Dünya Ticaret Örgütü

(WTO) cevabın pozitif olduğu inancındadır (Levine, 2001). 1990'lı yılların ortalarında hemen her ekolden anaakım ekonomistler, sermaye hesabı liberalizasyonunu yani fonların ülke içi ve dışına serbest ticaretini, ekonomik kalkınmanın asli basamaklarından biri olarak önerdi. 1997 Eylül'ünde, bunu destekler nitelikte, IMF'nin yönetici bünyesi "*sermaye hareketinin liberalizasyonunun IMF'nin amaçlarından biri olduğu, ve IMF'nin yetki alanının bu tür hareketin liberalizasyonu hususunda lazım geldikçe genişleyeceği…*" açıklamasını yapmıştı (Prasad ve Rajan, 2008).

Öte yandan, Paul Krugman (1993) tam tersini savunur. Krugman, geleneksel büyüme analizinin genel olarak sermayeye az ağırlık verdiğini, ve bu sebeple uluslararası sermaye akışının muazzam ölçülerde olmadıkça ekonomik büyümeyi teşvik edeceğine inanmak için yeterli sebep olmadığını söyler. Benzer şekilde Rodrik (1999) uygun controller, düzenlemeler ve makroekonomik politikalar olmadan finansal büyümenin çok pahalıya patlayabileceği konusuda uyarır. Felaket boyutundaki 1997-98 Asya krizi sonrasında, bu zıt görüşteki önde gelen ekonomistler finansal küreselleşmenin faydaları elle tutulamaz ve belgelenemezken getirdiği riskin reel ve muazzam olduğunu söyler. Obstfeld (2008), finansal açıklığın büyüme üzerindeki zayıf ve halen belirsiz doğrudan etkileri de düşünülürse, özellikle gelişmekte olan ülkelerin finansal serbestleşmeyi kademeli ve dikkatli şekilde arttırması gereğini ifade eder.

Bunlara ek olarak, kurumsal kalite, finansal açıklık ve büyüme ilişkisinde önemli bir kanal olarak düşünüldüğünden, literatürde hatırı sayılır ilgi görmüştür. Yasa gücü, söz hakkı ve denetime açıklık, yozlaşma derecesi ve benzeri kalitatif indikatörler sermayenin takibi ve tahsisini yani finansal olarak açık ülkelerin kırılganlığını etkileyebilir. Bir dizi ampirik çalışma yüksek kurumsal kaliteye dahip ülkelerin finansal açıklıktan net büyüme faydaları sağladığını söylerken, bazıları kurumsal kalitenin derecesini belirleyerek politikalar üretecek kadar yeterli delil olmadığını savunur. Öte yandan, bazı çalışmalar, ülkelerin finansal açıklıktan büyüme faydası sağlayabilmesi için kurumsal kalitenin erişmesi gereken doğrusal olmayan eşik değerleri incelemiştir. Daha iyi kurumların daha fazla finansal gelişmeye ve daha çok büyümeye götürdüğü görüşü Adam Smith'in "Ulusların Zenginliği" çalışmasında oldukça geniş yer almıştı (Osili ve Paulson tarafından alıntılandı, 2004). Kurumsal kaliteyi yasal orijin, ortak yasa, kurumsal

yönetim, yatırımcı hakları ve dahası gibi pek çok farklı açıdan ele alan pek çok ampirik çalışma bu görüşü savunmaktadır (La Porta *ve diğerleri.*, 2000; Levine, 1998; Levine, Loayza ve Beck, 2000; Rajan ve Zingales, 2003; Beck, Demirguc-Kunt ve Levine, 2003a and 2003b; Acemoglu,Johnson ve Robinson, 2001).

Finansal açıklığın büyüme üzerindeki fayda ve zararlarını belirleyebilmek üzere teorik ve ampirik alanda bir çok çalışma ve araştırma gerçekleşmiş, ve çoğu finansal ve kurumsal gelişmişliğin büyümede etkin olup olmadığını sorgulamıştır. Yine de, halen, bu çalışmaların hiç biri, özellikle tüm bu etmenlerin ölçümünde ciddi problemler olmasından sebep, somut fikir birliğine varamamıştır.

Bu çalışmanın temel amacı finans ve büyüme ilişkisi üzerine devam eden münazaraya farklı açılardan yaklaşan ampirik bir katkı sağlamaktır. Çalışma, finansal açıklık ve finansal gelişmenin büyüme üzerindeki direk ve dolaylı etkilerini inceleme ve bu etkileri belilemek adına çeşitli ekonometrik teknikleri uygulama amacındadır. Öncelikle, bu çalışmada, literatürde sıklıkla kullanılan geleneksel büyüme regresyonlarından farklı olarak, ekonometrik uygunluk açısından bağımlı değişken olarak reel gelirin birincil farkı değil düzeyi kullanılmıştır. İkinci olarak, finansal açıklık ve finansal gelişmişliğin rolü sadece tüm örneklem için değil ekonomik kalkınma sevielerine gore ayrıştırılan alt örneklemler için de analiz edilmiştir. Her bir etmenin etkisi hem gelişmiş, hem kalkınma hem de gelişmekte olan ekonomiler için belirlenmeye ve karşılaştırılmaya çalışılmıştır. Bu çalışma, kurumsal kalite ve büyüme konulu çalışmalara da PolityIV veri tabanı (Marshall *ve diğerleri,* 2010) kullanılarak oluşturulan ve nispeten daha kapsamlı olan bir değişkeni kucaklayarak katkıda bulunmuştur. Finansal açıklık ve finansal gelişmenin büyüme üzerindeki etkisinin yönü ve büyüklüğünün kurumsal kalitenin düzeyine gore değişip değişmediği belirlenmeye çalışılmıştır.

Çalışma temelini uluslararası makroekonomide finansal açıklık ve finansal gelişimin ekonomik büyümedeki etkisi başlıkları oluşturmuştur. Aynı zamanda kurumsallaşma kalitesi de ele alınmıştır ve rejimin finans ve büyüme ilişkisine etkisi de incelenmiştir. Çalışma, standart makroekonomik değişkenlerden ekonomik büyüme literatüründe kullanımı yaygın olanların yanı sıra incelikle seçilmiş değişkenler ve genellikle kullanılanın haricinde birkaç piyasa serbestleşme ölçütlerinden seçilmiştir. Bu

tez süregelen literatürden farklı olarak finans piyasasındaki kurumsal yapılanmayı politik rejim karakteristiğinin de alışılan belirleyici faktörlerin yanına ekleyerek analiz etmiştir.

Çalışmada finans-büyüme ilişkisi gelişmiş, yükselmekte olan ve gelişmekte olan ekonomilere sahip 105 ülkeden oluşan bir panel veri seti üzerinden gerçekleşmiştir. Çalışma 1960-2007 yıllarını kapsamakla birlikte ekonometrik modele dahil edilen değişkenlerin yeterliliğine göre değişmesine olanak veren dengesiz panel sistemi uygulanmıştır. Panel veri kullanımı analizlerimizde hem zaman serisi hem yatay kesit değişkenliğini bir arada kullanmamıza olanak sağlamıştır. Finansal açıklık ve gelişmişliğin büyümeye etkisini incelemk üzere kullandığımız modellerde büymenin geleneksel belirleyicileri olan ticari açıklık (reel ihracat ve ithalat toplamının GDYH'ya oranı olarak ölçümlenmiştir), nüfusta orta öğrenim düzeyi yüzdesi, enflasyon oranı (TÜFEdeki yıllık ortalama değişimle ölçümlenmiştir), kamu harcamalarının GSYH'ye oranı, birincil reel gelir gibi kontrol değişkenlerinin yanı sıra finansal açıklık ve finansal gelişme indikatörleri dikkate alınmıştır. Literatürde bugüne kadar geliştirilen çok çeşitli finansal açıklık (FO) ölçütlerinden en geniş ve var olanların içinde en iyisi olan de fakto ölçütlerden biri olan net yükümlülükler ve net varlıklar toplamının GSYH'ya oranı (Lane ve Milesi-Ferretti, 2007) finansal açıklık değişkenimiz olarak seçilmiştir. Finansal gelişmenin (FD) ölçüsü olarak ise finansal sistemin derinliğinin de belirleyicisi olan ve literatürde sıklıkla kullanılan likit yükümlülüklerin GSYH'ya oranı kullanılmıştır (Beck, Demirgüç-Kunt ve Levine, 2000).

Örneklemimizdeki ülkelerin ortalama büyüme hızları %4 iken, en büyük büyüme hızı %5 ile yükselen piyasa ekonomilerinde (EMG) ve en düşük büyüme hızı %2 ile Doğu Avrupa (EE) ülkelerinde görülmüştür. Bu panel veri ortamında büyümedeki ülke içi değişkenlik ülkeler arası değişkenlik ve örneklem içi değişkenlikten çok daha fazladır. Beklendiği üzere ortalamada en yüksek ortalama finansal açıklık finansal globalizasyon ve uluslararası piyasa entegrasyonunun zaten öncülerinden olan gelişmiş ülkelerde görülmektedir. Bunu takip eden Doğu Avrupa ülkeleri ve yükselen piyasa ekonomilerinde ortalama finansal açıklık sırasıyla %47ve %42 değerlerine ulaşmıştır. Diğer gelişmekte olan ülkeler (ODC) ise en düşük finansal açıklığı kaydederek %29 ortalamasında kalmıştır. Finansal açıklığın alt örneklemler arasında ve içerisindeki

varyasyonu yakındır. Aynı davranış finansal gelişmişlik için de görülmektedir. En yüksek finansal derinlik %70 ile endüstriyel ülkelerde ve %40 ile Doğu Avrupa ekonomilerinde hesaplanmıştır. Ülkedeki rejimin gelişmişliğine de işaret eden *polity2* değişkeni aynı zamanda ülkenin kurumsal kalitesinin de bir ölçütüdür. Beklendiği üzere endüstriyel ülkelerde bu değişken maksimum skor olan 10'a oldukça yakın olan 9.2 ile en yüksek değeri alır. Ayrıca sıkıntılı politik rejimleri ve zayıf ülke idaresine sahip ODC ülkeleri örneklemlerdeki en düşük polity2 ortalaması olan -1.0 skorunu almaktadır ki bu önceden belirlenmiş eşik değer olan *polity2*=0'in bile altındadır. Yükselen piyasa ülkeleri ise ortalamada 3.0 skorunu yakalayarak ümit vermektedir.

Bu çalışma ayrıca 1970 ve 2007 yılları arasında finans ve büyüme ilişkisini grafiklerle anlatmaktadır. Finansal entegrasyonda 1980 ortalarında uluslararası piyasalarda ciddi bir artış olsa da, ODC yani gelişmekte olan ülkeler bu zaman zarfında çıkış ve inişler yaşamıştır, bütün diğer ülkeler ise istikrarlı bir yükseliş kaydetmiştir. Basit korelasyonları özetleyen tablolar ekonomik büyüme ve de fakto finansal açıklık arasında hiçbir görünür ilişki olmadığını söylemektedir. Ülke alt örneklemlerinde, sadece Doğu Avrupa ülkeleri az ama pozitif bir ilişki sergilemiş, diğer taraftan diğer ülkeler belirgin bir ilişki kaydetmemiştir. Finansal gelişim-büyüme korelasyonu açısından da durum aynıdır. Finansal gelişme ve büyüme grafiği belirgin bir kalıp izlemeiyor görünmektedir. Bu gerçekler ışığında, her ne kadar keskin sonuçlara varmak için yetersiz olsa da, bu çalışma finans-büyüme ilişkisinin bir ülkenin kurumsal gelişmişliği gibi dolaylı faktörler değiştikçe değişebileceğini dikkate almıştır. Gerçekten de, basit serpme grafikler, yükselen piyasa ekonomileri ve gelişmekte olan ülkeler için finansal açıklık ve kurumsal gelişmişlik arasında doğrusal bir ilişki olabileceğine işaret etmektedir. Aynı yorum, finansal gelişmişlik ve kurumsal gelişmişlik ilişkisi içinde geçerlidir. Genel olarak, illustratif analizler finansal açıklığın büyümeyi direk kanallardan tetiklediğine dair belirgin bir ampirik kanıt sunmamaktadır. Bu, altında yatan teori çok güçlü olmasına rağmen, finansal entegrasyon, finansal gelişme ve büyüme arasında güçlü ve dirençli bir ilişkiye dair somut makro bir kanıt bulunmasının neden bu kadar zor olduğunun işareti olabilir.

Bu çalışmada, finans-büyüme ilişkisini incelemek amacıyla üç farklı ekonometrik teknik dengesiz panel veri kapsamında uygulanmıştır. Finanstan büyüme faydaları sağlayabilmek için kurumsal gelişmişlikte belli bir düzeyin sağlanması gibi bazı önkoşulların büyüme üzerinde dolaylı etkileri olabileceğinden bahsetmiştik. Bu sebeple, tahmin metotlarımızı hem kurumsal gelişmemiş hem kurumsl gelişmiş ülkeler olalarak iki farklı kategoride uyguladık. Bir ülkedeki politik rejimin karakteri, yasa gücü, yozlaşma, hükümet etkinliği ve şeffaflık gibi kurumsal kalitenin geleneksel ölçütlerini halihazırda kapsadığından, bu çalışmada kurumsal kalitenin düzeyini temsilen bu geleneksel indikatörler yerine kurumsal kaliteyi demokrasinin düzeyini de yanına katarak ifade eden *polity2* değişkenini kullanmayı tercih ettik (Cavallo ve Cavallo, 2010). Persson ve Tabellini (2008) *polity2*'nin 0 değerini aldığı durumları demokrasinin cömert bir tanımı olarak ifade etmiştir. Kendilerinin bu çalışmasını takiben, biz de çalışmamızda *polity2=0*'ı eşik değer olarak belirledik, ve *polity2*'nin pozitif değerlerini kurumsal gelişmişliğin, negatif değerlerini ise kurumsal gelişmemişliğin göstergesi olarak yorumladık.

Çalışmada ilk olarak bir panel veri sabit etkiler tahmini uygulandı. Geçici dalgalamaları ve iş çevrimi dalgalanmalarını düzlemek ve değişkenler arasındaki uzun dönem denge durumu ilişkisini yakalayabilmek amacıyla yıllık veri örtüşmeyen 5-yıllık ortalamalara dönüştürüldü variables (Beck *ve diğerleri,* 2000; Levine *ve diğerleri*, 2000; Beck, 2008; Bekaert *ve diğerleri,* 2009). Tüm örneklem ele alındığında, sonuçlar kurumsal gelişmişlik düzeyinin, finansal açıklıktan büyüme faydası sağlamak için önem teşkil ettiğini gösterdi. Bunun yanında finansal gelişmişliğin kurumsal gelişmişliğin düzeyi ne olursa olsun büyümeyi arttırdığı görüldü. Yine de, sonuçların her bir alt örneklem için ekonomik kalkınma seviyeleri dikkate alınarak yorumlanması daha doğru olacaktır.

Analizler sadece bir kaç tane kurumsal olarak gelişmemiş endüstriyel ülke olduğunu gösterdiğinden, panel veri sabit etkiler modellemesi bu alt grup için tüm gelişmiş ülkeler örnekleme katılarak gerçekleştirildi. Sonuçlar Schumpeteryan görüşü destekler nitelikte yani finansal gelişmişliğin büyümeyi yükselttiği yönünde bulundu. Finansal açıklığın da %6 düzeyiyle büyüme üzerinde pozitif ve istatiksel olarak anlamlı

etkisi olduğunu gösterdi. Bu tahmin gelişmiş ülkeler zaten neredeyse tamamen uluslararası piyasalara geniş şekilde entegre olduğundan, beklendiği üzere çok küçük bir sayı olarak bulundu.

Yükselmekte olan piyasa ekonomileri içinse sabit etkiler tahmin sonuçları oldukça dikkate değer çıktı. Bu ülkelerde kurumsal gelişmenin düzeyi ne olursa olsun, hem finansal açıklığın ve hem de finansal gelişmişliğin büyümeyi hızlandırdığı, fakat, kurumsal gelişmişlik eşik değeri geçince bu faydanın neredeyse iki kat daha arttığı görüldü. Kurumsal gelişmişliği zayıf yükselmekte olan piyasa ekonomisine sahip ülkelerin finansala çıklığındaki bir birim artışın büyümeyi %40 arttırdığı, kurumsal gelişmişlik eşik değeri geçtiğind eise bu katkının yaklaşık %70lere çıktığı görüldü. Sonuçlarımız daha gelişmiş finansal piyasaların ve daha fazla finansal açıklığın yükselmekte olan piyasa ekonomilerinde büyümeyi herhangi bir ön koşul aramaksızın arttıtdığını gösterdi. Bunun yanında gelişmekte olan ülkeler için sonuçlar oldukça farklıydı. Gelişmekte olan ülke kurumsal olarak gelişmemiş ise ne finansal açıklık ne de finansal gelişmişliğin büyüme üzerinde anlamlı bir etkisi yokken, kurumsal gelişmişlik eşik düzeyi geçtiğinde her iki etmen de büyümeyi %70 oranlarında pozitif etkiliyor görüldü. Açıkça, gelişmekte olan ülkeler finansal entegrasyon ve finansal derinlikten büyüme faydası sağlayabilmek için ilk olarak kurumsal gelişmişlik düzeylerini arttırmak durumundadırlar.

Çalışma örnekleminde yer alan Doğu Avrupa ülkeleri, çoğunlukla eski doğu bloku kalıntıları olan, küçük ekonomilerdir. Bu ülkeler arasında da kurumsal gelişmişliği eşik değerin altında olan yalnızca 3 ülke bulunduğundan ekonometrik analizlerimiz tüm ülkeleri örneklem alt grubuna katarak gerçekleştirilmiştir. Bu alt örneklem grubu için sonuçlar yine hem finansal açıklık hem finansal gelişmişliğin büyümeyi olumlu etkilediği yönünde çıkmıştır. Üstelik, diğer ülke alt örneklem grupları ile kıyaslandığında finansal gelişmişliğin büyüme üzerindeki etkisi en geniş bu ülkeler için bulunmuştur. Sonuç olarak, panel veri sabit etkiler tahmin sonuçları hem finansal açıklık hem finansal derinliğin büyümeyi beslediğini fakat kurumsal gelişmişliğin bu iki araçtan büyüme faydası sağlamak ya da bu faydayı daha da arttırmak adına önemli olduğunu göstermiştir.

Çalışmada ikinci metot olarak, gecikmesi dağıtılmış otoregresif model (ARDL) kullanılmıştır. Zaman ortalamalı geleneksel metotlar system değişkenleri arasındaki dinamik ilişkiyi maskelediğinden, farklı zaman periyotlarındaki faydalı zıt etkiyi elediğinden ve bilgi kaybı yarattığından, yıllık verinin fiks aralıklarla ortalamasını almak yerine finansal açıklık ve finansal gelişmişliğin büyüme üzerindeki kısa ve uzun dönem etkileri yıllık veri panel veri hata düzeltme modellemesi ile çalışılmıştır. Bu metot sistemdeki kısa dönem dinamikleri ve uzun dönem etkileri bir arada ortak bir gecikmesi dağıtılmış otoregresif model (ARDL) aracılığıyla incelememize olanak sağladı. Bunun yanısıra, ARDL modellerin en öne çıkan özelliği olan değişkenlerin I(0), I(1) ya da eşbütünleşik olup olmadığının kontrole dilerek belirlenmesi zorunluluğunu ortadan kaldırmıştır. Dahası, ARDL modellerin bir diğer avantajı sistemdeki açıklayıcı değişkenler endojen olsa da istatistiksel tahmin yapmayı sağlamasıdır.

Tüm örnekleme uygulanan panel ARDL tahmini önemli bir sonuca işaret etmiştir. Kurumsal gelişmemiş ülkelerde finansal açıklık büyüme üzerinde kısa dönemde pozitif ve anlamlı bir etkiye sahipken, uzun döneme bu etki negatife dönmektedir. Yani, bir ülke kurumsal olarak gelişmemişse finansal açıklık kısa dönemde büyümeyi teşvik edici görünse de uzun dönemde büyük risk taşımaktadır. Kurumsal gelişmişlik eşik değerin üzerinde ise, finansal açıklık ve büyüme arasındaki ilişki hem kısa dönem hem uzun dönemde pozitif ve anlamlı görülmektedir. Kısacası, kısa dönem faydaları uzun dönem riskerini ekarte etse dahi, ülkeler dikkatli olmalı ve finansal açıklığı bütünüyle kucaklamadan once kurumsal gelişmişlik sağlamalıdırlar. Diğer yandan, finansal gelişmişliğin büyüme üzerindeki etkisi, kurumsal gelişmişlik düzeyi ne olursa olsun, kısa dönemde anlamsız uzun dönemde ise pozitif ve anlamlı olarak görüldü. Bu noktada, finansal gelişmişlik ölçüsüne ait uzun dönem tahminin kurumsal kalite yükseldiğinde mühim ölçüde arttığı da görüldü. Kurumsal gelişmişliği zayıf olan ülkeler için Hata Düzeltme Terimi (RCT) katsayısı oldukça küçük tahmin edilmiştir ki bu da bir şoktan sonra sistemin yendien dengeye dönmesinin çok zor olduğunu işaret etmektedir. Oysa kurumsal gelişmiş ülkelerde ECT katsayısı sistemin yaklaşık üç buçuk yılda yeniden dengeye geleceğini söylemektedir.

Panel ARDL tahminine göre, gelişmiş ülkelerdeki finans-büyüme ilişkisi hem uzun hem kısa dönemde pozitif ve anlamlıdır. Kısa dönem etkisi 0.06 gibi çok düşük bir düzeyde olsa dahi bu etki uzun dönemde 0.5lere çıkmaktadır. Bunun yanında finansal açıklığın hem uzun hem kısa dönemde anlamlı ama çok küçük bir etkisi olduğu görülmektedir. Yükselmekte olan piyasa ekonomilerine gelirsek, kurumsal gelişmişlik düzeyi ne olursa olsun bu metot da finansal açıklık ve finansal derinliğin büyüme üzerinde hem kısa hem uzun dönemde kalkındırıcı etkisi olduğunu söylemektedir. Bu sebeple, finansal açıklığın yükselen piyasa ekonomileride büyüme üzerinde direk etkisi olduğunu iddia edebiliriz. Kurumsal gelişmişliği güçlü yükselen piyaa ekonomilerinde bir sonuç dikkat çekicidir: Finansal derinliğin büyüme üzerindeki pozitif uzun dönem ve fakat negatif kısa dönem etkileri Kaminsky ve Schmukler (2003)'in "kısa dönem acı uzun dönem kazanç" mottosuyla açıklanabilir. Finansal gelişmişlik genellikle finansal açıklığı takip eder ve finansal açıklığın özellikle daha yüksek bir büyüme patikasına girmek isteyen gelişmekte olan ülkelere kısa dönem maliyeti vardır.

Panel veri sabit etkiler tahmininde olduğu gibi, panel ARDL spesifikasyonunda da gelişmekte olan ülkelerde kurumsal kalkınmanın finans-büyüme ilişkisi için ne kadar önemli olduğu görülmektedir. Kısa dönemde, kurumsal gelişmişlik düzeyinden bağımsız olarak, finansal açıklığın büyüme üzerinde pozitif ve anlamlı etkisi bulunmuştur. Fakat, uzun dönem sonuçları finansal açıklığın kurumsal olarak zayıf gelişmekte olan ülkelerin büyümesini ciddi şekilde azalttığını göstermektedir. Sonuçlar, kurumsal olarak gelişmemiş gelişmekte olan ülkelerde finansal açıklıktaki artışın reel geliri %40 oranında düşürdüğünü göstermektedir. Oysa, gelişmekte olan ülkelerin kurumsal gelişmişliği arttığında finansal açıklıktan elde ettikleri fayda neredeyse %60 oranında reel gelir artışıdır. Finansal gelişmişlikte ise, kurumsal olarak zayıf gelişmekte olan ülkelerde finansal derinliğin büyüme üzernde ne kısa ne uzun dönem etkisi görülmemektedir. Fakat, bu ülkeler kurumsal gelişmişlik düzeyini arttırdıklarında, finansal derinliğin kısa dönemde olmasa dahi uzun dönemde büyümeye anlamlı pozitif katkısı olmaktadır. Özetle bu sonuçlar, gelişmekte olan ülkelerin finansal açıklık ve gelişmeden büyüme faydası sağlayabilmek için ilk ve öncelikle kurumsal gelişmişliklerini artıracak uzun dönem politikalara odaklanması gerektiğini söylemektedir.

Çalışmanın dikkat çeken sonuçlarından biri olarak, panel ARDL metodu göstermektedir ki, gelişmekte olan ülkeler haricinde diğer ülke alt grupları için kurumsal gelişmişlik düzeyi ne olursa olsun finansal açıklık ve finansal gelişmişlik büyüme üzerinde pozitif ve anlamlı uzun dönem etkiye sahiptir. Yine de, bir ülke kurumsal gelişmişlik düzeyini eşik değerin üzerine çıkardığında finansın büyümeye faydası da katlanarak artmaktadır. Bundan dolayı, bu çalışma endüstriyel, yüksek kalkınma piyasaları ve Doğu Avrupa ekonomileri için finansal gelişmenin arz öncü olduğu görüşten yana sonuçlar bulmuştur. Gelişmekte olan ülkeler içinse kurumsal gelişmede minimumda eşik değer sağlanmadan bu ülkelerin uzun dönemde finansal değişkenlerden büyüme sağlayamacakları gösterilmiştir.

Bu sonuçlara ek olarak, panel ARDL yaklaşımı farklı gelir gruplarındaki ülkeler dikkate alınarak da uygulanmış ve yüksek, orta ve düşük gelir gruplarına gore finansal etmenlerin büyüme üzerindeki kısa ve uzun dönem etkileri incelenmiştir. Sonuçlar yüksek ve orta gelir grubundaki ülkeler için finansal açıklık ve büyüme arasında pozitif kısa ve uzun dönem ilişki olduğunu, bunun yanında düşük gelir ülke grubu için bu ilişkinin negative ya da en iyi halde anlamsız olduğunu göstermiştir. Bunn yanında finansal açıklık göstergesi için %42 oranında bir tahmin edici ile finansal açıklıktan en fazla büyüme faydasını orta gelir ülke grubunun sağladığı görülmüştür. Finansal derinliğin uzun dönem tahmini de yine yüksek ve orta gelir ülke grupları için pozitif ve anlamlıyken, düşük gelir ülke grupları için istatistiksel olarak anlamsız çıkmıştır. İlginçtir, yüksek ve orta gelir grubu ülkelerin finansal gelişmişlik tahmin katsayıları arasında önemli bir fark bulunmamıştır. Öte yandan, kısa dönem dinamikleri farklı davranmaktadır. Finansal gelişmişlik yüksek gelir grubu ülkelerde kısa dönemde büyümeyi pozitif olarak etkilemektedir, oysa orta ve düşük gelir grubu ülkelerin büyümesinde tamamen anlamsız bulunmuştur.

Panel ARDL tahminlerinin yanında, dinamik panel veri sistemleri için Arellano ve Bond (1991) ve Arellano ve Bover (1995) tarafından geliştirilen dinamik genelleştirilmiş momentler metodu (GMM) da potansiyel eşzamanlılık ve dolayısıyla bağımlı değişkenlerdeki içsellik problemlerinin üstesinden gelmek için uygulanmıştır. Dinamik GMM sonuçları hem genel örneklem hem de alt örneklemler için daha önceki

bulgularımızla tutarlık göstermiştir. Gelişmiş ülkeler finansal açıklık ve finansal gelişmeden küçük miktarlarda büyüme faydaları sağlamaktadır. Yükselen piyasa ekonomilerinde ise finansal açıklık büyümeyi kurumsal gelişmişlik düzeyi ne olursa olsun pozitif yönde etkilemekte ve arttırmaktadır. Yine de bu ülkeler kurumsal gelişmişlikte eşik değerin üzerine çıktıklarında bu fayda neredeyse iki kat artarak %50lerden %90 gibi çok büyük oranlara çıkmaktadır. Finansal gelişmenin büyümeye olumlu etkisi olması için ise yükselen piyasa ekonomilerinin kurumsal gelişmiş olmalıdırlar. Gelişmekte olan ülkeler için GMM sonuçları daha öncekileri yineler, gelişmekte olan ülkeler hem finansal açıklık hem finasal gelişmeden büyüme faydası sağlayabilmek için once kurumsal gelişmişlik düzeylerini artırmalıdırlar. Kurumsal gelişmişliği zayıf gelişmekte olan ülkelerde ne finansal açıklık ne de finansal derinlik büyümeye etki etmemektedir. Oysa, gelişmekte olan ülkeler kurumsal gelişmişlik düzeylerini eşik değerin üstüne çıkardıkları anda bu iki etmenden büyüme faydası sağlayabilmektedirler.

Bu çalışmanın ampirik çerçevesi özellikle yükselen piyasa ve gelişmekte olan piyasa ekonomilerinde kurumsal gelişmişlik düzeyinin dolaylı bir kanal olarak büyümeyi etkileyip etkilemediği ile de ilgilendiğinden, finansal açıklık, finansal gelişmişlik ve bunların kurumsal gelişmişlik ile etkileşiminin istatsitiksel olarak anlamlı olup olmadığı da incelenmiştir. Bu amaçla iki yeni etkileşim değişkeni tanımlanmış ve dinamik GMM bu değişkenler de kullanılarak yeniden uygulanmıştır. Sonuçlara göre, yükselen piyasa ekonomilerinde kurumsal gelişmişlik düzeyinin ne finansal açıklığın ne de finansal derinliğin büyüme üzerindeki olumlu etkisinde anlamlı bir değişiklik yaratmadığı görülmüştür. Yükselen piyasa ekonomilerinde, her iki finansal değişken de kurumsal kaliteden bağımsız olarak büyümeyi pozitif yönde etkilemektedir. Yine de, önceki sonuçların da gösterdiği gibi, kurumsal gelişmişlik için belirlenen eşik değeri aşıldığında bu değişkenlerin büyüme üzerindeki olumlu etkisi neredeyse iki kat artmaktadır. Öte yandan, kurmsal kalitesi zayıf gelişmekte olan ülkeler için, finansal açıklığın büyüme adına anlamlı bir değişken olmadığı, finansal entagrasyonun ancak ve ancak kurumsal gelişmişlik düzeyi belirlenen eşik değer olan sıfırı geçtiği takdirde büyümeyi pozitif ve anlamlı etkilediği görülmüştür. Buna rağmen, finansal gelişmişlik gelişmekte olan ülkelerde kurumsal gelişmişlik düzeyi ne olursa olsun büyümeyi pozitif etkilemektedir. Kısacası, gelişmekte olan ülkeler için kurumsal gelişmişlik düzeyinin eşik değerin altında

ya da üstünde oması finansal açıklık ve büyüme ilişkisini etkilerken, finansal gelişmişlik ve büyüme ilişkisini etkilememektedir.

Sonuç olarak, bu çalışmanın bulguları pozitif bir finans-büyüme ilişkisi olduğunu ortaya koymuş ve kurumsal gelişmişliğin önemine dikkat çekmiştir. Çalışmanın temel sonucu literatürdeki neticesiz bulguların varlığına ve farklı koşullara dirençli somut bir sonucun yokluğuna sebep olarak farklı kalkınma düzeylerindeki farklı ülke gruplarının seçimi, ve daha önemlisi dolaylı etkilerden oluşan doğrusal olmayan etkileri varsaymaktadır. Bugüne kadar elde edilemeyen somut ve dirençli bir ekonometrik kanıtın olmayışı finansal açıklığın sadece risk taşıyıp hiç fayda sağlamadığı düşüncesine götürmemelidir. Öyle ki, bu çalışma finansal açıklıkla gelen ve fakat standart doğrusal modeller kullanılarak bulunması çok zor olan dolaylı etkilerin önemini vurgulamaktadır, zira finansal açıklık, finansal gelişme ve büyüme arasındaki ilişki kurumsal gelişmişlik düzeyi değiştikçe önemli şekilde değişmektedir.

Ampirik cephede, çalışmanın sonuçları kurumsal gelişmişlikte belirlediğimiz eşik değerin finans-büyüme ilişkisinde önemli bir etmen olduğunu açıkça göstermektedir. Nispeten genç ve hızla büyüyen yükselen piyasa ekonomilerinin uluslararası finansal entegrasyondan hiç bir önkoşul ya da ön şart olmaksızın en büyük ölçüde fayda sağladığı çalışmanın önemli sonuçlarından biridir. Öte yandan, gelişmekte olan ülkeler dikkatle davranmak durumundadırlar zira finansal açılma politikalarına hız vermeden evvel kurumsal gelişmişlik düzeylerini iyileştirmezlerse, finansal açıklık büyümelerini yavaşlatabilir ve dahi çok daha ciddi problemlere yol açabilir. Kısacası, kaliteli kurumlar ve istikrarlı bir idare ile birleştiğinde finasal açıklık gelişmekte olan ülkelerin ekonomik büyümesine fayda getirebilir. Finansal gelişmişlik açısındansa, bu çalışmanın ampirik sonuçları, büyük ölçüde, finansal gelişmişliğin büyümeyi tetiklediğini göstermiştir. Finansal gelişmişlikten büyümeye giden dolaylı kanal olarak ise özellikle gelişmekte olan ülkelerde yine kurumsal gelişmişliğin düzeyi öne çıkmaktadır.