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UNIVERSITY OF THE WITWATERSRAND
FACULTY OF COMMERCE, LAW AND MANAGEMENT



SCHOOL OF ECONOMIC AND BUSINESS SCIENCES
DEPARTMENT OF ECONOMICS

FINANCE-GROWTH NEXUS AND EFFECTS OF BANKING CRISIS

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MASTER OF COMMERCE (FINANCIAL ECONOMICS) 100% BY DISSERTATION DEGREE PROGRAMME

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FINANCE-GROWTH NEXUS AND EFFECTS OF BANKING CRISIS

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A Research Report submitted to the School of Economics and Business Science, University of the Witwatersrand, Johannesburg, in fulfillment of a Master of Commerce (Financial Economics) degree.

Johannesburg, November 2007

Declaration

I declare that this research report is my own, unaided work. It is submitted in fulfillment of the requirements of a Master of Commerce (Financial Economics) degree in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this, or any other University.

Name of Student: **Edmore T. Musasiwa**

Signed: _____

Date: _____ day of _____

Dedication

In memory of my late father.

Edson Tongesai Musasiwa

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Abstract

Many economists have observed that the financial system has a positive and monotonic effect on economic growth. In this study we reaffirm the finance-growth nexus. We adopt a three-tier approach for the study's methodology using panel data of 66 countries from 1986 to 2005. Firstly, we test for the finance-growth nexus with particular emphasis on financial sector indicators that best represent the effective financing activity in the economy. Secondly, we examine the financial market type that exacerbates or mitigates the effects of a shock (financial crisis). Thirdly, we investigate the causes of financial crisis by looking at both the macroeconomic and institutional, and micro-level determinants of banking crisis.

Our results show that financial development enhances economic growth, more so, in the middle income countries. We also find that increased domestic private credit and activity reduces the effects of a financial shock on growth. In addition, openness of the economy in low income Sub-Saharan African countries is important for growth even where financial development indicators appear not to influence growth. In most economies the investment channel and openness are consistent in explaining economic growth.

"Finance is, as it were, the stomach of the country, from which all the other organs take their tone." William Gladstone[1] [1858].

1 Introduction

In the last decade, many economists have observed that the financial system has a positive and monotonic effect on economic growth. Schumpeter [1911] argues that financial markets, through their various intermediation roles, play a significant part in facilitating growth. One of the many ways by which the financial system enhances economic growth is through channeling funds from surplus saving units to deficit saving units, who usually have the most productive use for the funds. The continued efficient allocation of funds to deficit units with worthwhile projects has, ultimately, a positive spillover effect that culminates in economic growth. In addition to reaffirming the evidence that finance enhances growth, this paper seeks to trace the effects of an exogenous shock on a financial system on economic growth. In this paper, financial crises, with particular reference to banking crisis, make up the exogenous shock. Development of a financial system through increased financial depth and improved financial structure are hypothesized to increase per capita income [Levine, 1997]. Furthermore, it is argued that a well-developed financial system acts a cushion to such shocks thus fostering economic stability.

A common finding in the finance-growth literature is that the increased availability of financial instruments and institutions enhances the intermediation roles of the financial system by reducing transaction and information costs [Rioja and Valev, 2002]. A well functioning financial system is one that has the capability of reducing such costs. Thus, the general characteristics of a well functioning system are

[1] Former British Prime Minister

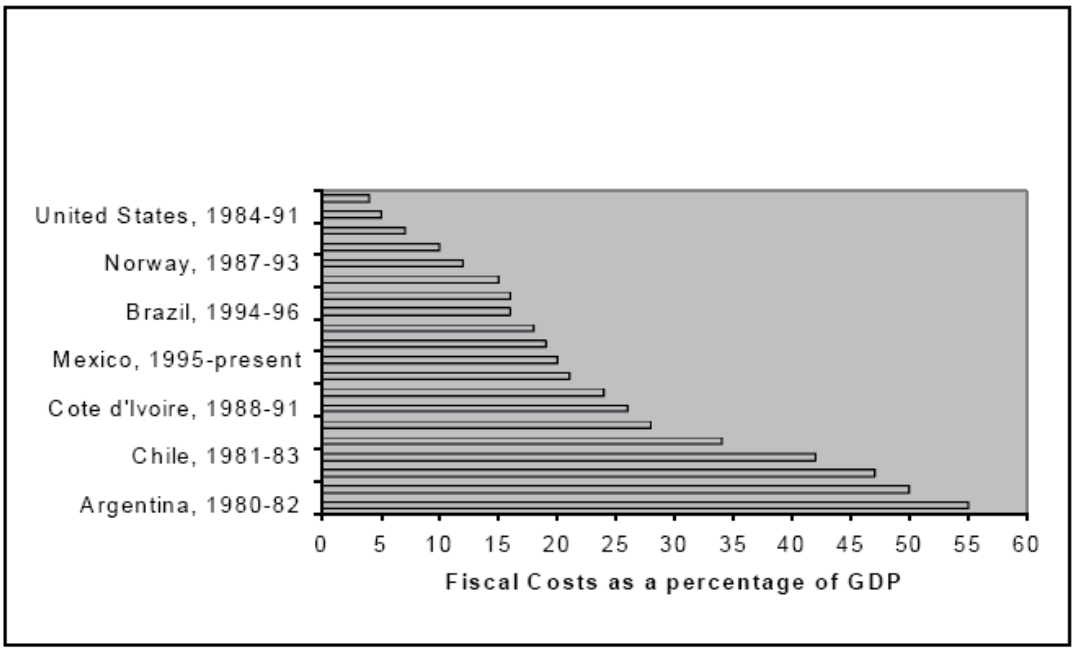
pooling of funds, pooling of risk and efficient monitoring of borrowed funds, which subsequently raises investment and economic growth [Stiglitz, 1998; Rioja and Valev, 2002]. Growth in private domestic credit and liquid liabilities are some measures of financial development that confirm the increased functionality of the financial system [Levine, 1997].

Rajan and Zingales [1998] argue that the services the financial sector provides - through reallocation of capital to the highest value of use without substantial loss of value through moral hazard, adverse selection or transaction costs - are important in spurring economic growth. The various intermediation roles of financial institutions are thus critical in achieving macroeconomic stability and growth of the economy. This paper attempts to illustrate that financial crisis, whether banking or currency, can affect the efficiency of financial institutions in performing their critical roles, thus leading to a reduction in per capita GDP in the long run. Another objective of this paper is to broadly establish the causes of financial crises in emerging economies.

In recent years, many countries have experienced financial crises, which had adverse effects on the stability and growth of their respective economies. Lindgren et al [1996] have reported that over 1980-1996, at least two thirds of the IMF member countries experienced significant banking sector problems. Dziobek and Pazarbasioglu [1998] find that often the causes of the banking crises are as a result of weak bank supervision, political interference and inadequate capitalization of the banking system. The recent financial crises of East Asia in mid-1990s and its contagion effects on other emerging economies, has rekindled interest in financial crises among economists. One of the major reasons for this increased interest is the high fiscal costs that are associated with a systematic banking crisis. The costs of systemic bank restructuring are very high. It would be appreciated from a political

administration viewpoint if such costs could be avoided as they weigh heavily on the taxpayers and can seriously handicap efforts to control budget deficits [Nkomo and Schaling, 2000]. Figure 1 illustrates some country-specific costs of banking crises over different time horizons.

Figure 1: Cost of Bank Crises



Source: Bamber, Falkena, Llewellyn and Store [2001]

We observe in Figure 1 that, banking crises are more severe in emerging economies countries than their developed counterparts. Honohan [1996] describes the occurrence of banking crises in the last quarter of the century as "unprecedented".

1.1 Statement of Research Problems

Empirical studies have shown that development of the financial system is positively related to economic growth. Many economists agree that the intermediation roles of the financial system - more so by banking institutions – are crucial to the economic growth of a country. Carstens [2004] argues that there is wealth redistribution and overall reduction in both income and wealth in every episode of

banking crises. In addition, the cost of restructuring a financial system hit by a crisis impacts negatively on the fiscal budget, existing shareholders, current depositors, future depositors and borrowers.

Amplified frictions are induced within the financial system by a financial crisis, leading to widening interest spreads. Consequently, wider interest rate spreads can result in credit crunches when net credit to the private sector declines sharply, increasing the likelihood of a severe crisis coupled with a further reduction in economic growth. Widened interest rate spreads also acutely erode the ability of borrowers to pay back loans, resulting in higher incidents of non-performing loans, which may trigger instability and may degenerate into a widespread crisis. In some instances, the financial crises may spill over to neighboring countries linked through trade or financial interaction.

In developing countries, financial markets are generally underdeveloped and access to credit is widely restricted to banks thus placing greater importance on banks for economic stability and growth. The non-bank credit markets as well as stock markets are thin and or underdeveloped and this forces banks to emerge as the relative 'sole financiers' of the private sector in particular. Besides reducing information and transaction costs through efficient gathering and dissemination of information to the public to encourage savings, banks also allocate credit to firms that have the highest value use.

The pervasive nature of banks makes them vulnerable to large fluctuations in macroeconomic variables such as short term interest rates, inflation and exchange rates. Such volatilities can affect the relationship between a bank's assets and liabilities far beyond the cushioning provided by bank capital. Such a development can give rise to bank insolvency or a systemic crisis if the authorities do not

effectively monitor bank operations. In the past, governments have been blamed for over-interference in their financial systems especially with regards to credit allocation. The low levels of financial system development in developing countries are hypothesized by some authors to have caused the financial market to be susceptible to crises. The effect of the financial distress of banks may not only be felt in the country in which they are domiciled, but may filter to their major trading partners as was the case in the East Asian crises of the mid-1990s.

Given the scenario discussed above, governments have to ensure that they reduce their interference in the financial market and that the correction of such conditions is done systematically and not leave their country's financial system exposed. Some economies went into financial turmoil as a result of premature financial liberalization without the necessary legal framework and expertise to ensure the expected positive economic growth.

Though it is the authorities' prerogative to monitor and formulate effective policies that ensure the general financial system's stability and resilience to exogenous shocks, we note that it may be difficult to identify an appropriate policy framework. The uncertainty with regards to the scope and impact of an exogenous shock to the system complicates the formulation of efficient policies. In addition, the inter-dependence of banks and other economic sectors can amplify weaknesses in the economy. Such inter-dependence may compound the difficulties in formulating a policy response to say, capital inflows. Unfortunately, the credibility of the authorities matter in steering the economy out of a crisis. This credibility may be at its lowest especially after a systemic crisis has occurred [Carstens, Hardy, and Pazarbasioglu, 2004]. Political uncertainty further complicates the role of the regulatory and supervisory authorities. The government has to support the policy reforms for them to

be effective. We shall therefore attempt to tease out helpful hints from the empirical analyses of past financial (banking) crises that could assist us anticipate as well as possibly minimize, if not, forestall the recurrence of future financial crises in developing economies.

1.2 Objectives of Study

Empirical evidence shows that banking crises can recur in an economy that has experienced them before but did not take sufficient corrective measures. In Latin America, banking crises have occurred in some countries more than once. Argentina and Ecuador suffered four and three episodes of banking crisis respectively, during the period between 1980 and 2001 [Carstens 2004]. We thus investigate the causes of the recent banking crisis in developing economies with an eye to teasing out possible "antidotes" that the authorities can craft into a corrective policy which in turn may prevent the recurrence of such a crisis.

It has been documented in the literature that a financial crises such as a banking crises, may seriously affect the effectiveness of the financial intermediation process, which negatively affects economic stability and economic growth. Theory argues that the costs of resolving a financial crisis are usually borne by the taxpayers and this may seriously handicap efforts at proper management of fiscal budgets. Socio-economic and sometimes political costs may result from a banking crisis. The social costs could be in the form of job losses and the associated costs of drop in standards of living as a result of lower GDP per capita, not only from fallen banks but other firms from different sectors of the economy that are affected by the resulting instabilities. Economic growth is also affected through a reduction in credit to the private sector.

This paper has three main objectives. The first objective is to trace the growth effects of the financial system on the economy by using different constructs of financial development. We also seek to verify the extent to which a developed financial system would serve as an effective buffer against external macroeconomic shocks such as a financial crisis. The hypothesis that we test here is that the development of a financial system through increased financial depth and improved financial architecture, increases per capita income. The efficient roles of financial intermediation allow for enhanced steady state economic growth. There should therefore be less vulnerability of the developing countries to an exogenous shock on their financial systems.

Literature identifies the banking system as playing a major role in efficiently allocating credit to economic sectors that are external finance dependent. Thus, our second objective is to test for the impact of banking crisis on economic growth. We also seek to identify which financial market type exacerbates or mitigates the impact of a financial shock. We also investigate the macro (environmental) determinants for the banking crises in developing countries because of their implications for economic growth. Many a time, financial system authorities have been blamed for trying to resolve banking crisis symptoms and not the institutional/macroeconomic causes. Such misplaced focus, by the authorities, has in some instances worsened the crisis in some economies.

The third objective is to analyze bank-specific determinants of banking crisis. We hypothesize that the instabilities in the macro environment exacerbate crisis oriented problems that originate from banks. Identifying firm specific determinants of banking crisis can help policy makers develop early warning systems capable of reducing the likelihood of a banking crisis. However, in the event that a

macroeconomic shock occurs, a well developed financial system can cushion the shock, thus reducing its ultimate impact on economic output.

2 Literature Review

The recurrent episodes of financial crises around the world have drawn the attention of many economists. The major reason for this attention is that financial crises have dampening effect on the optimal performance of a financial system, which ultimately retards economic growth. In addition, empirical evidence finds that the cost of restructuring a systemic bank crises as being very significant and can seriously handicap efforts to control the budget deficits (Nkomo and Schaling, 2000). Furthermore, the resurgence of financial crises has prompted the Bretton Woods institutions and national authorities to make concerted efforts to identify the set of soundness indicators to be used as a surveillance tool of potential crises.

Most economists believe the Great Depression of the 1930s was made much more severe by problems of the US financial system, more specifically on the banking sector and financial markets inefficiencies (Brandl, 2004). Brandl also notes that the dramatic1980s economic slowdown in Texas, United States, was linked to the savings and loan crisis that occurred at the time. During this period, the poor economic performance of the US was linked to the problematic banking sector.

The debate on the relationship between the financial system and economy performance began a long time ago. Bagehot (1873) and Schumpeter (1911) argue that economic growth was brought about by a well functioning financial system. A well functioning financial system allocates funds to the most efficient entrepreneurs,

shares risk, provides stability in the economy and also reduces transaction costs[2]. Moreover, a well functioning financial system can enhance growth by spurring technological innovation, and by identifying and funding entrepreneurs with the best chance of successfully implementing innovative products and procedures (Schumpeter, 1911).

Conversely, authors such as Robinson (1952) and Lucas (1988) argue that financial systems do no matter for economic growth. Robinson observes that financial system emerges in a passive way to the needs of the real economy. She notes that 'enterprise leads and finance follows'. Lucas also finds that financial development simply follows or reflects an anticipation of economic development. In addition, traditional neoclassical literature on growth suggests that finance is not important promoting economic growth. It attributes growth to the following sources: factor accumulation and innovation. Factor accumulation is identified as the engine of economic growth as opposed to contemporary economists, who identify banks instead.

Empirical evidence in development economics shows a strong relationship between financial development and economic growth (McKinnon 1973 and Shaw 1973). McKinnon advocates a policy that abolishes "repression" by freeing financial markets. Liberalization of the financial market generally involves freeing the market of barriers to entry and allowing the market to set the equilibrium price in the economy. Increased international movement of capital, competition from foreign participation in the banking sector, and reduced controls on foreign currency accounts increases credit to private sector. However, in an environment with weak supervision, financial liberalization may increase the likelihood of a financial crisis through

[2] See Pilbeam (2005) for an in-depth analysis of a well functioning financial system.

increased risky activity without the required skill to measure and monitor it, both by the bankers and the financial system authorities. Various measures of financial development, in this case through financial liberalization, lead to an ultimate increase in liquid liabilities and investment levels in the economy.

In recent years however, works of King and Levine (1993b), Pagano (1993) and Levine (1997, 1998), reveal that the financial system plays an important role in accelerating economic growth. They employ their models to various data sets; at firm level, country level and cross-country level, in order to demonstrate the relationship between the financial system and economic performance. The work by King and Levine (1993b) shows that the level of financial depth, which they defined as the ratio of liquid assets to GDP, does in fact help to predict economic growth. In addition, studies by Levine (1997, 1998) also show that financial intermediary development enhances economic growth.

The predominant players in the financial system in this context are banks - though that does not rule out the influence of other non-bank players in the financial system. Banks also act as a transmission medium of the monetary policies of financial market regulators and central banks, among other roles. This direct contact with the authorities makes banks of paramount importance in the financial system. Since the late 1980s African countries have been implementing financial sector reforms as a part of broader market oriented economic reforms. The following section discusses the stylized facts on the finance-growth relationship.

2.1 Nexus of Finance and Growth: Issues and Stylized Facts

Several studies based on large-country samples show that financial sector development has an economically important impact on growth (Bekaert and Harvey,

1997; Rajan and Zingales, 1998; King and Levine, 1993b). Some authors find that the relationship varies with the level of economic development for instance, between developing and developed countries (Levine, 1997; Rousseau and Watchel, 1998). Most of the research on the finance-growth nexus stems from the influential seminal articles of King and Levine (1993a, 1993b).

King and Levine (1993a, 1993b) find that the financial system can spur economic growth by observing a sample of 80 countries during the period 1960-1989 using purely cross country analysis. In their analysis, they develop various measures of financial development to capture the mechanism by which the financial sector results in economic growth and also to test empirically the finance growth nexus. Consequently, they find that the measures of financial development are robustly related to per capita growth, physical capital accumulation, and an increase in economic efficiency.

Levine and Zervos (1998) use cross-section methodology to ascertain the relationship between financial development and economic growth. They find that stock market liquidity and banking sector development are positively correlated with contemporaneous and future rates of economic growth, productivity and capital accumulation. In addition, they find that channeling of financial resources (through lending) to the private sector has a significant influence on economic growth.

The level of financial intermediation has a positive effect on growth (Beck, Levine and Loayza, 2000). They examine whether the exogenous components of financial development influence growth, basing their investigation of the relationship on broad samples of industrialized and emerging economies. They find a significant relationship between the level of financial intermediation and economic growth.

Beck, Levine and Loayza (2000) study whether cross country differences in the legal rights of creditors, the efficiency of contract enforcement, and accounting standards, play an important role in accelerating growth. They further observe that the countries that have better legal environment, encompassing all three aspects stated above, tend to have better developed financial intermediaries, which in turn, leads to a large and positive effect on growth[3]. Given the intermittent occurrence of political disability in emerging economies, the influence of the legal environment on growth is quite relevant in our analysis. An environment with stable rule of laws governing contracts and property rights would protect business and ensure continuous proper functioning of financial markets even during periods of political instability.

La Porta et al (1997) argue that whether the financial market is largely bank or equity market dominated is of no consequence to economic growth. A higher enforcement quality of the financial contracts through a strong independent legal system spurs economic growth. La Porta et al (1997) find across countries that legal environments have large effects on the size and depth of capital markets. The crux of their study was to examine the ability of firms to raise external finance through different legal settings. Due to differing legal enforcement of financial contracts across countries, primarily as a result of their legal origin, they find that the French civil law countries have the least investor protection compared to common law countries[4].

Bekaert and Harvey (1997) find that the efficiency and liquidity of stock markets and other capital markets are of paramount importance in the growth process. They note that the role of financial institutions and capital markets is to allocate capital efficiently, that is allocating funds to investment projects with the highest

[3] Also see La Porta et al (1997) for a review of the legal aspect on growth
[4] The other legal origins are English, Germany and Scandinavian.

marginal product of capital and promoting firm specialization. They point out that the most evident symptoms of an inefficient stock market are increased transaction costs and illiquidity. Similarly, Levine and Zervos (1998) confirm that market liquidity is correlated to the rate of economic growth and that banking and stock market development independently influence economic growth.

While past studies demonstrate that the level of financial development sets the tone for economic growth for example, King and Levine (1993a, b); Levine and Zervos (1998), the direction of causality has not been unanimously agreed. According to Robinson (1952) and Lucas (1988), on the other hand, finance is relatively an unimportant factor in promoting growth. They attribute lack of financial development to lack of demand for financial services. As the real sector grows, demand for various financial services rises and thus result in the manifestation of the financial system. However, a later study by Zhenhui (2000) finds, with higher certainty, that that finance results in economic growth. Zhenhui applies the multivariate VAR panel techniques to 41 developing countries to test for the finance causal effect on growth. He finds strong evidence that financial development is important for economic growth both in the short term and in the long term. Zhenhui notes that investment is an important channel through which financial development influences economic growth.

The level of investment, as documented by Zenhui (2000), is necessitated by a well functioning financial system, thus it will be an important conduit through which financial development impacts on economic growth in our work. Similarly, Abu-Bader and Abu-Qarn (2005) use investment as share of GDP to capture the channel through which financial development translates to economic growth.

As reported by Lindgren et al (1996) many developed and developing countries have experienced severe banking crises. As a result, the massive cost of resolving a systematic banking problem has raised widespread concern, as the proliferation of large scale banking crises disrupts the flow of credit to households and enterprises, reducing investment and consumption and possibly forcing viable firms into bankruptcy (Demirgüc-Kunt and Detragiache, 1997). Theory also states that banking crises have the effect of undermining public confidence in domestic banks and thus lead to a decline in domestic savings. Consequently, a decline in savings almost spells a simultaneous decline in investment, with an ultimate effect of shrinking economic activity.

Furthermore, where the authorities attempt to prevent the widespread effect of a banking crisis, either explicitly or implicitly, the consequences are still significant. Pursuit of a rescue operation, regardless of its nature, has proved to be very costly for the budget (Demirgüc-Kunt and Detragiache, 1997). They observe that moral hazard concerns may arise due to expected future bailouts by letting inefficient banks continue operating. Consequently, other banks will lack the incentive to boost their risk management function, as otherwise healthy banks bear the losses of ailing institutions, for instance, through explicit deposit insurance schemes. Loosening the monetary policy in an attempt to rescue banks may actually be inflationary, and with a fixed peg foreign exchange rate regime. It may trigger a speculative attack on the currency, as postulated in the first and second-generation models discussed in the following section. It is thus clear from this review that government policy plays a crucial role in steering financial markets towards a non-crises and stable path, so as to enhance sustainable long run growth.

Empirical evidence from financial economics studies has, for most times, been in conformity with the hypothesis that financial development accelerates economic growth. This has led economists to explore ways in which financial systems can be improved with the aim of achieving this goal. Increased financial intermediation through liberalizing the financial system has a positive correlation with economic growth (McKinnon 1973 and Shaw 1973). Liberalization of the financial markets allows more players to enter the sector thereby setting the tone for competitiveness. In such an environment, credit is allocated more efficiently to worthwhile projects while being prudent at the same time. Bencivenga and Smith (1991) find that well developed financial intermediaries channel resources into longer-term activities, which are more productive than short-term activities.

2.2 Generation Models

2.2.1 First Generation Models

The first generation models were authored by Krugman (1979) and refined by Flood and Garber (1984). These models relied on government debt and the perceived inability of the government to control the budget as causes of the crisis (Chiodo and Owyang, 1998). They define a currency crisis as a speculative attack on a domestic country's currency brought about by agents switching their holdings to foreign denominated ones. This portfolio alteration is brought about by the investor's anticipation of high government debt being financed by seignorage.

The first generation models show that a speculative attack on domestic currency is attributed to a growing capital account deficit or an anticipation by economic agents of fiscal deficit financing through the government's ability to print money

(seignorage). For governments that are drawing down on their foreign reserves to defend their peg, a speculative attack occurs when these foreign reserves have been depleted. Thus, a fixed exchange rate regime is more susceptible to a speculative attack (Krugman, 1979). Krugman argues that the government cannot continue to defend the peg through drawing on reserves perpetually. However, as economic agents change their portfolios from domestic to foreign currency, the government must continue to draw down on its international reserves to starve off the speculative attacks. Consequently, a crisis is triggered when agents anticipate the government to abandon the peg.

2.2.2 Second Generation Models

Obstfeld (1994) initiated the second-generation models, and later on, Eichengreen, Rose and Wyplosz (1997) developed the fuller models. These models explain the self-fulfilling contagious currency crises. By this they mean that a depreciation of one country's currency affects the price level or the current account as a result of a decline in a neighboring country's exports. Consequently, devaluation of the neighboring country's currency becomes highly likely (Chiodo and Owyang, 1998). The second-generation models envisage a positive relationship between a speculative attack on, say, country A's currency to a crisis in country B (the host country). Such contagion effects from one currency to another is attributed to war, price shocks or to the interdependence of a group of trading partners. According to Eichengreen, Rose and Wyplosz (1997) devaluation in a country's currency can arise because of either the trade link between the countries or the similarities in their economic conditions. They also argue that devaluation can be transmitted through world financial markets to other susceptible countries.

2.3 Inflation, Finance and Growth

Inflation effects have often been ignored in economic growth studies. Recent empirical work has shown that inflation retards economic growth. According to the Mundell-Tobin effect, inflation has a positive relationship with capital accumulation. This argument stems from the view put forward by Mundell (1965) and Tobin (1965), that under the assumption that money and capital are substitutes; a rise in inflation increases the cost of holding money and induces a portfolio shift from money to capital. As a result, such a view illustrates that inflation encourages saving, reducing the interest rate, which results in higher levels of investment and growth. Conversely, some authors argue that inflation acts as a tax on investment, which, in turn, increases the effective costs of investments (De Gregorio, 1996; Jones and Manuelli 1993; Fischer 1993).

The negative effects of inflation on growth have generally received little attention, especially the effects of inflation via financial markets. McKinnon (1973) and Shaw (1973) emphasize the importance of price stability as an essential prerequisite for financial intermediation to evolve in the development process. According to Fischer (1993), inflation is a constraint to growth because it increases uncertainty about the macro environment. Particularly, in financial intermediation, inflation discourages long-term contracting by exacerbating informational problems already inherent in the financial system and by increasing moral hazard problems in the banking sector (McKinnon, 1991). By limiting long-term investments and inducing high degrees of uncertainty in the market, inflation stifles the growth process.

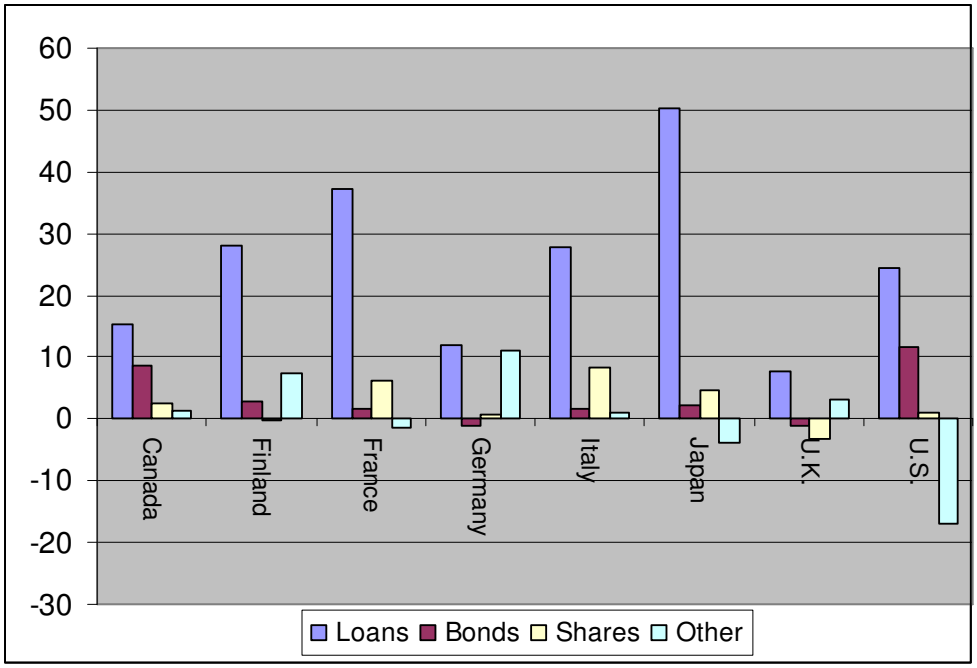
2.4 The Financial System

2.4.1 Financial Intermediation, Financial Markets, and Institutions

Financial intermediation is the process of pooling funds from surplus saving units to deficit saving units who have the most efficient use for the resources. Surplus units usually do not like to lose control of their savings for a long time while deficit units have projects that have a longer gestation period before profits may be realized. Financial intermediation resolves this dilemma by transforming the short-term deposits of the surplus units to longer-term loans that are required by the deficit units. This allows the high return projects time to mature, and as such attain the profit objective. Thus, the asset transformation capability of the financial intermediation allows for increased economic growth.

The resources that are channeled by financial intermediation into attractive production ventures are classified into two categories - direct credit and indirect credit. Direct credit is provided through money market and capital market debts sale to the public, while indirect credit is provided through banks. Indirect credit provided by banks has been observed to be greater than direct credit.

Figure 2: Net Financing of Non-financial Enterprises, 1970-1985 (%)



Source: Mayer (1990) based on OECD Financial Statistics

This has made banks occupy a more important position in the financial system of most countries. Bank loans are the predominant source of external finance in most countries as shown in Figure 2. For example, in the United States and Japan, 24 and 50 percent of firms' investment respectively, was financed through bank loans between 1970 and 1985. Bank loans, as external financing, are significantly the largest proportion of all countries.

Banks' special place in the financial system stems from their enhanced ability to bail out distressed firms through debt restructuring. Gilson, John, and Lang (1990) find that firms that depend on bank financing have a higher likelihood of a successful debt restructuring than those that do not. They observe that it is more convenient for a problem firm to engage its bankers rather than discuss its problems with disparate bondholders.

Other non-bank financial institutions are also important in the financial system. Insurance firms, pension funds, mutual funds, and real estate investment units play important intermediation roles in the financial market as well. Insurance firms, for instance, have a significant amount of government and corporate bonds in their portfolios. In addition, insurance firms are among the major players in equity markets. Insurance firms have a role of minimizing risks for their investors and help provide financial instruments that ameliorate the risk of potential losses of premium holders.

Financial intermediation is a major vehicle for economic growth through the saving- investment process. In recent years, researchers have made progress in understanding the roles of financial intermediaries. Empirical evidence emanating from these studies suggests a positive correlation between enhanced intermediation and economic growth. This increased growth is attributed to the various roles that the financial markets, financial instruments and institutions play in ameliorating the problem created by informational and transaction costs (Levine, 1997). The friction created by information and transaction costs gives rise to financial systems, which in turn, facilitate resource allocation across space and time (Merton and Bodie, 1995:p.12).

Recent growth theories acknowledge capital accumulation and technological innovation as channels by which the financial system may affect long run growth. Capital accumulation and technological innovation are necessitated by various financial intermediation roles and are realized through various institutions that make up the financial system. Levine (1997) identifies the primary functions of the financial system as those activities, which give rise to resource mobilization, facilitation of foreign capital and optimal allocation of capital to worthwhile projects and are stated as follows:

i. Savings mobilization
ii. Risk management
iii. Acquiring information about investment opportunities
iv. Monitoring borrowers and exerting corporate control
v. Facilitating exchange of goods and services

The next section now discusses these roles in greater detail and how they eventually culminate in economic growth enhancement.

2.5 Roles of the Financial System

2.5.1 Savings Mobilization

Individual deficit savings units rarely have enough funds to undertake profitable investments. On the other hand, individual surplus savings units, without pooling their savings, would not be able to take advantage of the potential increasing returns to scale of their investments. The financial system – including banks and other financial intermediaries, and equity markets – solves this problem by pooling savings of disaggregated savers, allocating capital to the most important uses, and monitoring ex post to curb against misappropriation of the resources. Further, the mobilization of savings allows resources to be allocated to productive uses, which in turn, encourages capital accumulation and increases long-run investments. This long run investment results in higher productivity by the private sector.

Mobilization of savings is a paramount function of the financial system as without the pooling of savings, households would not be flexible in their investment decisions. Households would have to, incredibly, buy or sell the whole firm in the absence of financial intermediaries (Levine, 1997). Sirri and Tufano (1995) argue that

mobilization of savings and that the effective allocation of resources into high return projects ultimately spurs economic growth. Bagehot (1873) argues that better savings mobilization releases resources that boost technological innovation. Much earlier, McKinnon (1973) observes that effectively mobilizing resources for productive projects might play a crucial role in facilitating the adoption of better technologies which encourage growth. Credit made available to finance education or health promotes human capital accumulation, a vital factor in the growth process (De Gregorio, 1996). This affirms the importance of the savings mobilization role of the financial system in positively affecting economic growth through increased investment and productivity.

2.5.2 Risk Management

Financial intermediaries may help mitigate liquidity risk concerns of economic agents (Diamond and Dybvig 1983; Bencivenga and Smith, 1991). Many high return projects have longer gestation periods, at the same time, requiring large capital outlays. Such projects would experience credit rationing, as the investors are unlikely to give up their savings, as they do not prefer to give up control of their savings for long periods. They would want to have an option to withdraw their savings or switch them into alternative investment vehicles easily, should the need arise. However, financial intermediaries have the ability to alleviate this dilemma by pooling and transforming short-term investments of savers into long term assets (loans to high return projects) while savers can redeem their savings on demand. Thus, by eliminating liquidity risks, financial intermediaries can increase credit to high return projects and also accelerate economic growth (Bencivenga and Smith, 1991).

Developments of the capital markets augment the liquidity of the whole financial system (Levine, 1997). Liquid stock markets, for instance, allow the equity

holders to sell their shares to any buyer, while the entrepreneur maintains access to capital invested into their firm by the initial shareholders. Production also proceeds uninterrupted making the achievement of output and profit targets attainable. In addition, as the stock market transaction costs fall, more investment is made in projects with higher life spans and higher returns, allowing faster steady state growth (Levine, 1997).

Savers are usually risk averse and therefore would not put away their funds in vehicles they perceive to be risky. Through financial intermediation however, this risk may be ameliorated by financial instruments designed to trade risks (risk sharing) to agents more willing and capable of bearing for the appropriate fees. Derivative instruments are, for instance, such instruments that arise to ameliorate downside risk. The existence of a host of financial instruments and markets allows investments to be made in riskier projects with higher returns (Saint-Paul, 1992; Obstfeld, 1994). This is achieved by diversifying risk through investing in different projects, sectors or countries whose expected returns are not correlated. However, the fixed costs associated with each transaction of a different financial asset are reduced by taking advantage of large economies of scale, especially in the case of banks. Risk diversification thus enhances resource allocation and overall investment returns for savers, which in turn significantly expands economic growth.

Furthermore, risk diversification allows increased technological innovation (Levine, 1997). Innovation is usually very risky and, yet again, many investors may be unwilling to engage their funds in such activities. However, the ability of individual investors to diversify their risk by holding portfolios that include innovation-based enterprises reduces the aggregate risk significantly enabling them to commit their funds in such activities that have a higher return. Thus, by making

capital available to innovators, through the risk diversification role of financial intermediation, technological change may be boosted and hence economic growth (King and Levine, 1993).

2.5.3 Acquiring Information

It may be difficult for individual savers to assess firms, managers, and market conditions as to allow them make informed decisions on investment strategies (Carosso, 1970). Disparate savers may not even have the capacity with regards to expertise and resources to collect and process information on financial markets and the economy. Thus, the high information costs that arise in the process may impede efficient allocation of resources to activities that have the highest value. Moreover, savers are not eager to invest in activities about which they have insufficient information. Such information asymmetries create incentives for financial intermediaries to emerge to ameliorate the problem (Diamond, 1984; Boyd and Prescott, 1986). Through increased economies of scale, the overall information costs for financial intermediaries fall. Banks for instance, collect information on behalf of savers and this enhances resources allocation and increases the level of investment. Banks have the expertise and resources to efficiently gather information on worthwhile projects on behalf of savers. Through various screening activities and continued relationship with borrowers, banks, in the long run, reduce information and transaction costs on the market and consequently leads to more efficient resource allocation and accelerated economic growth.

Stock markets are better placed to acquire and disseminate information about different firms listed with them. The reporting requirements of the stock exchanges may reduce information search costs for individual investors. As the stock markets become larger and more liquid, investors have greater privilege to acquire information

at a low cost about the listed firms and this may enable enhanced resource allocation (Grossman and Stiglitz, 1980). Merton (1987) documents that improved information about the future prospects of a firm elicits more investments and thus improve resource allocation and growth. Stock markets aggregate and disseminate information about a firm through the published stock price. The price reflects the information collected by the market on particular firms, making it cheaper for individual savers to invest based on market data. However, Stiglitz (1985) notes that stock markets quickly reveal firm information through the quoted price, and allows for information free-riding by individual investors, thus reducing information costs and enhancing resource allocation and accelerated economic growth.

2.5.4 Monitoring Borrowers, and Exerting Corporate Control

Besides reducing information costs greatly to allow more investment ex ante, the financial system also helps ameliorate information acquisition and monitoring costs ex post. Financial intermediaries monitor the performance of the firms on behalf of the disparate investors who in most cases lack the expertise and resources to monitor and exert corporate control on the firms. Banks for instance, impose caveats (for example, collateral) in the debt contracts with borrowers to ensure that funds are put to the intended use. Stiglitz and Weiss (1981, 1983) postulate that the absence of financial intermediaries to monitor and exert corporate control on borrowers may hinder the mobilization of savings which would otherwise be allocated to investments projects with high returns.

Romer (2001) argues that it may be costly for the outside investor to verify the entrepreneur's performance and returns (profitability) to an extent that the investor abandons the investment. In his model, Romer assumes that the outside investor will not verify returns if he obtains their required return, D, for instance. If the

entrepreneur's return is actually above that D, the investor simply receives D without verification. If the gross return of the project is equal to D, the investor takes all without verification. However, a problem arises when the gross return of the project is below D. The investor will incur a verification cost, C, and take the gross return that is less than D. So the verification cost will have to be netted off the gross return, further reducing the return due to the investor. Consequently, verification costs imply leverage, higher risk of default, and lower compensation to the outside investor[5].

The potential investor will find undertaking such an investment project costly and pull out. In addition, the increased agency costs add to the information and transaction costs and further reduce the likelihood of such projects being funded. Financial intermediaries arise to ameliorate increased monitoring costs (agency costs) and to exert corporate control by including appropriate covenants in debt contracts. For example, collateral and structuring financial contracts that are easily enforceable lowers monitoring and eliminates the barriers to efficient investment (Williamson, 1987; Bernanke and Gertler 1989 and 1990; Von Thadden, 1995).

A further decrease in information costs is achieved through the delegated monitoring role of financial intermediaries (Levine, 1997). If the borrower is to obtain funds from several disaggregated savers, it means that each saver has to seek information about the borrower's riskiness, which may be a long process that also results in duplication of information about the prospective borrower (Diamond, 1984). Financial intermediaries efficiently acquire information on the borrower (through for example a continued relationship) on behalf of the savers. Further, financial intermediaries economize on the ex post monitoring costs through continued

[5] For a detailed review of this theory see Romer (2001: 393-402).

interaction with borrowers. Ultimately, the delegated monitoring function of the financial system ensures efficient allocation of resources and economic growth.

Conversely, this may give rise to the problem of whom then "monitors the monitor" (Krasa and Villamil, 1992). However, savers may not have to monitor the monitor if we follow Romer's (2001) argument of verification costs. If the savers can redeem their deposits or investment on demand together with interest at the agreed date without any hitches, then the savers take their funds without verification. The government has a special interest in banks particularly as it is aware of the adverse economic implications of imprudent behavior on the part of bankers. Such awareness thus gives incentives for government to monitor banks on behalf of savers. For instance, the government requires that banks maintain diversified loan portfolios through sectoral lending so as to reduce overall risk in their lending process.

Linking managerial compensation to stock prices may also help to ameliorate agency problems (Diamond and Verrachia, 1982; Jensen and Murphy, 1990). Such an arrangement can help bring the managers' objectives in line with those of the owners (savers). The threat of takeovers from other firms will act as a mechanism that exerts corporate control on management. A takeover usually results in the loss of jobs for management of the absorbed firm. Thus, financial intermediation can promote better corporate governance and in the process facilitate efficient resource allocation and boost economic growth.

2.5.5 Facilitating Exchange

Smith (1776) postulates that the financial system can promote specialization. Specialization occurs through increased transactions of a particular contract or instrument which enables the financial system to lower transaction costs for savers

and facilitating the trading of goods and services between households and businesses. A better medium of exchange – money – arose to facilitate smoother transactions between two parties. The barter system was considered very costly through its highly illiquid nature. Money, for instance, avoids the double coincidence of needs and wants and thus reducing transaction and information costs.

Financial systems also provide an efficient payment mechanism in the economy. In developed countries most payments no longer involve the physical handling of cash between economic agents. Certain intermediaries, especially banks, facilitate the payments of funds by non-cash means for example cheques, credit cards, debit cards and electronic transfer of funds. More recently, non-banking financial institutions are now offering these services, which has subsequently, stepped up competition in the financial markets. In some countries, the clearing system activities have been relegated to larger banks. Increased efficiency in the payment system enables faster settling of obligations, which boosts economic activities.

2.6 Role of Government in Financial Markets

Financial markets play an important role in many economies as is amply indicated by the preceding sections. Economic agents have found it however necessary for governments to regulate them for the primary reason of maintaining macroeconomic stability, as the public usually lacks the expertise and depth of information to accurately evaluate the riskiness of a bank. In their regulation role, governments have greatly influenced the development and evolution of financial markets and institutions (Fabozzi, Modigliani and Ferri, 1994). The justification they offer is that in the absence of government regulation, financial markets would not produce and sell contracts in an efficient manner – the lowest possible cost.

Efficiency and low cost are hallmarks of competition. The government through its regulation mandate can influence competition by reducing barriers to entry of new participants (both domestic and foreign ones). This view is in contrast to the deregulation view of the financial system where government interference is associated with reduced financial market efficiency through controlling entry into the sector, for example. Some key objectives of the government in regulating the financial system are discussed next.

2.6.1 Objectives of Financial Market Regulation[6]

2.6.1.1 Disclosure Regulation

Disclosure regulation generally prevents the issuers of financial securities from defrauding investors by concealing relevant information to the public. The government levels the playing field by compelling the managers of issuing firm to disclose all material information about their current and future operations. Information disclosure will thus reduce information asymmetry and agency problems. The information disclosure requirement of the government not only requires managers of the issuing firm to publish material information about their current and future prospects, but ensures the timely dissemination of information in conformity with international best practice. Regulation of financial markets fosters greater public participation in financial markets as information costs are reduced through the various statutes that require firms to accurately and timely report on their current and future performance.

[6] The following objectives are largely drawn from Fabozzi, Modigliani and Ferri (1994)

2.6.1.2 Financial Activity Regulation

Financial activity regulation is mainly concerned with the overall efficiency of the financial market. Efficiency is fostered by safeguarding and promoting competition in the financial system (Di Giorgio, Di Noia and Piatti, 2000). Some of the rules that encourage competition are mainly focused on controlling, if not completely eliminating, insider trading, concentrations, cartels and abuse of dominant positions. Insider trading, for instance, is another problem that arises from asymmetric information, which obviously impinges on competition, as there results an uneven distribution of material information to both existing and potential investors.

2.6.1.3 Regulation of Financial Institutions

Regulation of financial institutions is that form of government regulation that controls the various financial institutions' activities with regards to capitalization or the lending and borrowing process, for example. Even the expansion of a financial institution's business through mergers and acquisitions or starting up a non-banking business should first be approved by the authorities. Control of financial activities in this way seeks to promote long run economic stability. Banks for instance, pool households and firms' savings; and lend these savings to firms that have the highest value use for them; and act as conduits of the monetary policy. In addition to facilitating the payment system, it would be unhealthy - from a macroeconomic stability viewpoint - if financial institutions were left to engage in unguided activities or imprudent intermediation.

2.6.1.4 Regulation of Foreign Participants

Government regulation also seeks to control roles of foreign firms in the domestic market. Foreign participants usually have better resources that can permit them to manipulate the system in their favor. Given their huge resources and widespread network, foreign participants can eliminate competition through hostile takeovers or acquisitions of other domestic institutions. Consequently, governments control foreign ownership in local financial institutions in order to ensure macroeconomic stability.

2.6.1.5 Banking and Monetary Regulation

The changes of money supply in the economy are closely related with economic conditions, especially inflation and unemployment. Therefore the government controls the 'money creation' capability of depository institutions through on lending and investments by setting a minimum reserve requirement. Monetary authorities also endeavor to steer the economy towards a balanced growth path through the banking system. Specifically, monetary policy targets broad economic fundamentals for instance, inflation; interest rates and money supply, so as to stimulate the overall economic activity. Banks thus play an important role as conduits in transmitting monetary policy unto the overall economy, in addition to facilitating economic activity via financial intermediation.

2.7 Financial Distress and Financial Crises

The recurrence of financial crises has been of major concern to economists. This has prompted an in depth study of financial crises to try and come up with early warning signals so as to reduce the likelihood of their occurrence and thus save on the

associated adverse costs. Lindgren et al (1996) report that over the period 1980-1996, at least two thirds of the IMF member countries have experienced financial crises. The fiscal costs of systemic bank restructuring have been found to be significantly high. The general public usually bears the costs involved in restructuring banks after a crisis and, in addition, it can seriously handicap efforts to control budget deficits (Nkomo and Schaling, 2000). Even if the use of public funds to recapitalize troubled banks is taken to be a domestic transfer instead of a real cost, it can force the authorities towards less benign ways of financing a budget deficit for example, printing money (Goldstein and Turner, 1996).

Financial system crises are not only costly, but may impede the effectiveness of the monetary policy. The benefits of financial intermediation are obscured when there is large scale failure of banks and are struggling to bolster their portfolios. The volume and efficiency of the financial intermediation is reduced when the financial system is plagued by a crisis leading to a reduction in the growth potential of the economy. During financial system chaos, the effectiveness of the monetary policy is impaired largely because troubled banks are less responsive to interest rate changes (Fischer, 1997). He also observes that the central bank, during such times, has to exercise cautiously its monetary policy for fear of pushing over the edge already struggling banks.

The pervasive nature of banks makes any problem associated with their operations of more concern compared to those of non-bank firms. Financial markets in developing markets are under developed and their economic operations largely rely on banks. Thus, their banking sectors' problems are more critical relative to those in developed financial markets. In many emerging markets there are thinly traded stock and capital markets, making banks the effective financiers, in most cases, of

investment activities in emerging economies. Consequently, problems in the banking sector would easily degenerate into adverse macroeconomic situations, which usually translate into retardation in economic growth.

Financial crises have been found to be more severe in emerging economies compared to their industrialized counterparts. Caprio and Klingebiel (1996) study banking crises in both emerging economies and developed ones. They found that Spain was the most affected developed country by banking crises during period between 1977and 1985. The estimated loss was 17 percent of GDP followed by Finland which had a loss of 8 percent of GDP during the period between 1991 and 1993. As for the developing economies, they found the losses to be much higher, in most instances, higher than 10 percent of their GDP, for instance, Venezuela had 17 percent and Mexico 15 percent; while Chile, Argentina and Cote d'Ivoire had loses greater than 25 percent of GDP.

As an alternative to recapitalization, weaker banks may cut back on private sector credit or widen their lending spreads. The reduction of credit or widening of lending spread may spell reduced investment and ultimately reduced economic growth. Furthermore, a banking crisis is likely to magnify a downturn in the real business cycle (Lindgren et al, 1996; Bernanke, 1983). The quality of investment also suffers as the probability of an increase in non- performing loans is higher due to increased cost of credit. The decline in the quality of investments is attributed to the worsening of information asymmetry and adverse selection problems that occurs during a financial crisis (De Gregrio and Gudotti, 1992; Mishkin, 1994). They note that the least creditworthy borrowers are the ones who are more prepared to pay a higher premium for the funds. In the process, the 'efficient allocation' role of the

financial system is hampered. Consequently, funds are allocated to the least productive activities adversely constraining economic growth.

Banks are useful transmission mediums for monetary policy. In some instances, banking crisis problems in developing countries have been attributed to poor monetary and fiscal policies effectiveness. Banking sector related problems might create problems that impede realization of monetary policy targets, which in turn, may affect the overall performance of the economy. Fears stretching an already strained banking sector over the edge may constrain the monetary authorities from tightening monetary policy to deal with for instance, loss of confidence by investors (both locally and internationally).

Kaminsky and Reinhart (1995) attribute the poor balance of payment position of examined countries to banking crises. They find that a banking crisis is preceded by a currency crisis exacerbates the banking crisis. In other literature, different models are used to show the causal effect of a banking crisis to a currency crisis. Valesco (1987) in his model shows that when the government prints more money to resuscitate failing banks, excess money is created. In the long run, such a process eventually ignites a currency crisis, which has an adverse causal effect on balance of payments stemming from negative movements in exchange rates.

In some developing countries, banks operate the payments system, hold the bulk of financial assets, are major purchasers of government bonds and provide liquid credit needed by the securities markets still in their infancy (Goldstein and Turner, 1996). Technological advancements in the information technology sector have smoothened payment system between banks across the globe in addition to blurring country boundaries. Consequently, systemic risk has been increased to a significant level. Payments can be made directly from one bank to another in shorter turn around

times. In the event of one bank facing problems, the effects can be easily transmitted to the entire financial system even across regions. Thus, the occurrence of financial crisis would be a lot more devastating in emerging economies.

The next section reviews occurrence of the East Asian financial crises of the mid-1990s. We pay particular attention to the determinants of the crisis as to tease out similarities and differences of other crises.

2.7.1 The East Asian Crisis of the Mid-1990s

An acute financial crisis occurred in East Asia in the mid-1990s. Prior to the crisis, Thailand, Malaysia, Philippines and Indonesia had enjoyed massive capital inflows particularly due to the appreciation of the Japanese yen and those of the newly industrialized countries (Kittiprapas, 2000). Many of the Asian economies had for decades enjoyed high rates of economics growth accompanied by impressive levels of savings and investment. On the whole, the macroeconomic variables of the Association of East Asian Nations (ASEAN) exhibited a healthy and steady growth trend before the onset of the crises.

Several economists agree that the East Asian crisis was largely unpredicted, as the macroeconomic indicators did not reveal any signs of an impending crisis. This has led many authors to attribute the crisis to market interactions together with an inadequate policy response of the international community which overreacted or panicked to a situation which did not warrant such a reaction (Hussain, Mlambo and Oshikoya, 1999). Even the IMF and the Asian Development Bank (ADB) failed to predict the looming crises (Bustelo, 1998). Other authors argue that the Asian countries were victims of their own success in that foreign investors failed to conduct a due diligence of the environment they were going to give up their funds to.

There has however been a consensus that the causes of the East Asian crises

exhibited a hybrid of structural policy weaknesses and distortions in micro and macro economic fundamentals of the affected countries. Empirical literature confirms that the occurrence of this crisis in the mid-1997 did not conform to the first and second-generation models that had been developed earlier. Bustelo (1998) argues that the causes of the East Asian financial crises are largely based on misguided management and self-fulfilling foreign financial panics. He notes that a fragile domestic financial market could be too one-dimensional in explaining the crises. Debt ratings by various international credit rating agencies, spreads on foreign lending, stock market indices, with the exception of Thailand, did not change significantly before the crises, thus making the prediction of the financial crises difficult.

2.7.1.1 Background to the East Asian Crisis

During the period prior to the financial turmoil, the ASEAN region experienced sustained economic growth with impressive structural changes and a general improvement in the living standards of its population. None of the standard macroeconomic indicators, such as nominal GDP growth, inflation, and fiscal budget balance showed signs of a crisis. The whole region experienced impressive growth rates which the World Bank in one of its reports termed as a "miracle" (World Bank, 1993).

Table 1: GDP Growth in East Asia, 1990-1997 (%)

	1990	1991	1992	1993	1994	1995	1996	1997
China	3.8	9.2	14.2	13.5	12.6	10.5	9.7	8.8
Hong Kong	3.4	5.1	6.3	6.1	5.4	3.9	4.9	5.3
Indonesia	9.0	5.3	9.0	8.9	7.3	7.5	8.2	5.0
Japan	5.1	3.8	1.0	0.3	0.6	1.5	3.9	0.9
Malaysia	9.6	8.6	7.8	8.3	9.2	9.5	8.6	7.8
Philippines	3.0	-0.6	0.3	2.1	4.4	4.8	5.7	5.1
Singapore	9.0	7.3	6.2	10.4	10.5	8.7	6.9	7.8
South Korea	9.5	9.1	5.1	5.8	8.6	8.9	7.1	5.5
Taiwan	5.4	7.6	6.8	6.3	6.5	6.0	5.7	6.9
Thailand	11.6	8.1	8.2	8.5	8.6	8.8	5.5	-0.4

Source: IMF (1998a), tables A2 and A6.

Most countries posted impressive GDP growth rates that were between 5 and 8 percent during 1990 and 1997 (see table 1). GDP growth rate, as an economic vulnerability indicator, showed impressive steadiness pre- crisis period.

Table 2: Inflation Rates in East Asia, 1994-1997 (%)

	1994	1995	1996	1997
Hong Kong	8.1	8.7	6.0	6.5
Indonesia	8.5	9.4	7.9	6.6
Malaysia	3.7	3.4	3.5	2.7
Philippines	9.0	8.1	8.4	5.1
Singapore	3.1	1.7	1.4	2.0
South Korea	6.3	4.5	4.9	4.3
Taiwan	4.1	3.7	3.1	0.9
Thailand	5.1	5.8	5.9	5.6

Source: IMF and for Taiwan, CBC

Inflation again, as a macroeconomic vulnerability indicator, did not exhibit any unhealthy signs. Generally, inflation in the East Asian region was at low levels (see table 2). In Taiwan and Malaysia, for example, the inflation rates trended downwards, which made the detection of the financial crises difficult to predict. As for Taiwan, the inflation rate fell from 4.1 percent in 1994 to 0.9 percent in 1997 while other countries enjoyed fairly similar declines on the inflation front.

2.7.1.2 Macroeconomic Explanations

2.7.1.2.1 Capital Flows

The decline of global interest rates in the early 1990s led to international investors to search for destinations that offered higher rates of return on investment. This renewed need for higher returns and portfolio diversification, together with globalization, saw an increase in the amount of capital flowing to developing countries. The capital inflows were largely bank loans and foreign direct investment (FDIs), which are largely volatile. The increased integration of emerging markets and the international markets gave the emerging countries an added advantage of an

increased technological advancement, improved expertise and higher general economic development. The financial integration, which resulted in surges in inward capital mobility, made emerging countries more vulnerable to financial crises in the event of a sharp unanticipated reversal of the capital flow (Reuven, 1998)

Massive capital inflows - especially short-term capital – are positively related to the occurrence of financial crises (Radelet and Sachs, 1998). Poor governance, inadequate supervision and regulation and inappropriate policy response to the initial surges in a credit boom may increase the likelihood of a financial crisis.

The Indonesian authorities failed to react to the credit boom, which were a result of huge capital inflows. Consequently, a credit boom in such an environment with poor policy results in misallocation of capital towards speculative sectors such real estate and equity markets. Table 3 shows the massive growth in domestic credit, which may have led to the accumulation of risky loan portfolios by financial intermediaries.

Table 3: Domestic Credit to Private Sector (% of GDP)

	1994	**1995**	**1996**	**1997**
Indonesia	51.9	53.5	55.4	62.0
Malaysia	76.5	86.8	93.4	n/a
Philippines	29.1	37.5	48.4	55.9
Singapore	84.2	90.8	96.0	n/a
South Korea	56.8	57.0	61.8	69.8
Taiwan	146.8	148.8	144.1	145.2
Thailand	91.0	97.6	101.9	116.3

Source: IMF and for Taiwan, CBC

Consequently, such a massive increase in credit with structural inefficiencies such as misallocation of funds, lax in monetary policy, driven by a surge in capital inflows due to exchange rate appreciation, can lead to increased vulnerability to financial crises.

Capital surges in a country with a fixed exchange rate regime, mainly preferred by developing countries as a means of maintaining export competitiveness, could result in monetary expansion, further triggering a build up of inflationary pressures. Generally, capital flows affect a wide range of economic variables, largely exchange rates, interest rates, foreign exchange reserves, monetary aggregates and the savings and investments rates of the recipient country (Kohli, 2001).

2.7.1.2.2 Pegged Exchange Rates

This macroeconomic indicator gave a more clear warning of the impending financial crisis in East Asia. Most countries in the region pegged their currencies against the US dollar. During the calm period, prior to the financial turmoil, pegging their currency against the US dollar minimized the risk faced by foreign investors, thus prompting a surge in capital inflows. Hussain, Mlambo and Oshikoya (1999), argue that the currency pegs are sustainable, only if the underlying economic and financial frameworks of the countries are harmonized. However, if these fundamentals are not aligned, capital inflows – especially of the short-term nature – may have economic destabilizing effects on the host country.

Table 4: Major Recipients of Capital Inflows that Succumbed to Financial Crises

Financial Crises Country, Year	Rank of Recipient by Absolute Volume of Portfolio Investment Flow for 1990-1996	Portfolio Investment Flow as a % GDP for 1990-1996	FDI Flow as a % of GDP for 1990-1996
Mexico 1994 - 1995	2	33.0	42.8
Thailand 1997	6	27.1	22.7
Indonesia 1997	7	17.7	22.7
Korea 1997	---	---	---
Malaysia 1997	5	62.7	47.2
Russian Federation 1998	11	4.8	18.7
Brazil 1999,2002	3	12.6	20.7
Turkey 2000 - 2001	10	12.6	22.1
Argentina 2001 – 2002	4	12.1	33.4
India	1	25.2	68.2
China	8	7.6	20.6
Chile	9	39.4	37.2

Source: IMF and World Bank Staff Estimates

The strength of the US dollar after 1995 resulted in the appreciation of most Asian currencies, which in turn reduced the competitiveness of their exports. With the exception of India, Chile, China, and Korea; most countries were forced to hike their interest rates and devalue their currency as a result of successfully defending their foreign exchange rate pegs (see Table 4)

2.7.1.2.3 Financial Reforms

In the 1990s, the most Asian countries deregulated their financial systems by reducing credit requirements, abolishing entry barriers for new financial institutions, and allowed banks to offer local corporations and individuals foreign denominated accounts. These financial reforms also allowed banks to extend credit to domestic firms in foreign currency denominated loans while restrictions on larger corporations to seek funding offshore were lifted. Domestic firms found these financial reforms very attractive and therefore entered foreign capital markets aggressively. At the same time, the local financial sector realized entry of several foreign financial institutions. Foreign banks contributed 60 percent of private capital inflows (largely short-term) in Asia in 1996 (Hussain, Mlambo and Oshikoya, 1999). Consequently, a credit boom bedeviled the region, which in turn necessitated the accumulation of risky assets on bank balance sheets. Thus, the credit boom resulted in increased vulnerability of the financial system.

2.7.1.2.4 Under-developed Financial Markets

The over-reliance on the banking sector for the provision of primary finance undermined the development of other debt markets. Consequently, banks found it difficult to hedge long-term lending as opposed to the short-term deposits they

received from surplus saving units (Bustelo, 1998). A well-developed financial system would ensure the existence of a mix of liquid markets – both bank-based and market-based. The existence of a liquid debt markets would have reduced the likelihood of the sudden and sharp reversal, in capital flows by offering an alternative investment avenues.

2.7.1.2.5 Macroeconomic Mismanagement

The usual indicators of an impending financial turmoil were not identifiable prior to the East Asian crises of the mid-1990s (Corsetti, Pesenti and Roubini, 1998). However, the Thai government ignored the warnings of a weakness in the fixed exchange rate regime (Kittiprapas, 2000). In an attempt to defend the peg the BOT drew down on foreign currency reserves until the reserves were totally depleted thus the only option left was that of floating the baht. The eventual devaluation of the baht prompted other financial markets in the region to panic, which in turn accelerated the crises. The imprudent behavior of bankers went unimpeded by the authorities further increasing the likelihood of a financial crisis. For example, there were increased incidences of imprudent accounting procedures adopted by many financial institutions, which worsened the extent of information asymmetry and moral hazard in the financial markets. Moreover, the indecisiveness of the Thai government in bailing out problematic financial institutions made the situation spin out of control (Kittiprapas, 2000).

Corporate governance failures were also prevalent in the private and public firms. This led to indiscipline in foreign borrowing and unproductive spending, which burdened the economies with huge foreign debts when their currencies got devalued. The lower interest rates for offshore loans as compared to domestic ones, led to

excessive borrowing and an equal tendency to invest the funds in speculative sectors such as real estate and equity markets.

2.8 Banking Crisis: A Form of Financial Crises

A broad type or classes of financial crises can be distinguished into the following:

i. A foreign debt crisis arises when a country cannot settle its foreign debt obligation (sovereign or private debt).

ii. A currency crisis is said to occur when a speculative attack on the exchange rate leads to the devaluation of that currency. As postulated in the first and second generation models, the government raises interest rate rates or draws down heavily on their foreign currency reserves in order to defend their currency.

iii. A banking crisis arises when actual or potential bank runs or failures lead banks to suspend the internal convertibility of their liabilities or forces the regulating authorities to intervene through various means such as liquidity assistance or forced bank suspension to protect it from further loss of deposits.

All the three types of financial crises have been empirically found to have common origins. Macroeconomic volatility and misalignments in asset prices that result in asset bubbles are some of the major causes of systemic banking crisis identified in the literature. The realignment of exchange rates and asset prices, mainly by agents adjusting their positions, exposes the underlying financial weaknesses which may eventually result in a financial crisis. In this paper, particular reference is made to banking crises though, to a lesser extent, we focus on currency crises.

Of the three types of financial crises, banking crises are the most difficult to identify empirically (IMF, 1998). While for currency crises, identification of sudden changes in the nominal exchange rate may signal its start, banking crises may be simply identified through huge withdrawals from bank balance sheets. One of the major drawbacks however is that data with regards to deposits of particular banks is not readily available or is incomplete in cases were it is present. Lack of such data is more severe in developing countries. It has been empirically observed that major banking crisis do not stem from the liabilities side of bank balance sheets. This was largely exhibited in banking crises that occurred in developed countries economies such as Spain and Finland in the late 1980s. In developing countries however, banking crisis have been closely related to huge withdrawals or failure to roll over inter-bank deposits as in the East Asian crisis of the mid 1990s. Other authors argue that huge withdrawals are symptoms and not the root causes of banking crises.

As noted above, banking crises usually originate from the asset side of bank balance sheets. Therefore, variables such as the proportion of non-performing loans in bank portfolios to earning assets, capital adequacy and large fluctuations in real estate and equity prices help signify episodes of baking crises. Yet again, such data is difficult to obtain especially for developing countries. Laxity on the part of regulators in carefully analyzing such data and subsequently taking timely corrective action before the situation generates into a fully blown crises has been observed as a major cause for banking crises. In addition, adverse movements in, say short term real interest rates, result in mismatches between assets and liabilities of the bank balance sheets, further complicating the asset-liability management function of banks.

2.8.1 Systemic Banking Crises

Failure of one bank has a lesser impact on the overall stability of the economy. The following discussion distinguishes such a banking crisis from a systemic one. Ergungor and Thompson (2005) argue that even in a healthy banking system, occasional banking failures will occur because different banks assimilate and manage risk differently. Consequently, the banking system's overall efficiency is enhanced because resources are reallocated from poorly managed banks to more efficient institutions. However, well-managed banks may also fail due to overexposure to risk which stimulates the market to anticipate that authorities will intervene to curb the risk exposure, with bank closure being one of the remedies. Such isolated events have a limited impact to the overall health of the financial system.

A systemic crisis is signaled by the simultaneous closure of banks and it involves insolvency of a large share of banking system. Caprio and Klingebiel (2003) define a systemic banking crisis as a condition in which the net worth of the whole banking system is almost or totally exhausted as non-performing loans extinguish most or all of the capital of the banking system. Bartholomew, Mote and Whalen (1995, p.9) define a systemic banking crisis as the probability of a sudden, usually unexpected, collapse of the market confidence in a significant of the banking system with potentially huge negative effects on the overall stability of the macro economy. Both definitions stress the system-wide effects of bank failures which are the key in distinguishing them from occasional individual bank distress. The following section discusses the determinants of systemic banking crisis.

The difficulties that exist in identifying a systemic banking crisis prompts us to use the following criteria together with definition given in the seminal work by Caprio

and Klingebiel (2003) to date the occurrence of crises. Similarly, a systemic crisis in our study denoted by:

i. Forced closure of banks, placement under judiciary management or under curatorship.

ii. Merger or consolidation of financial institutions and or managed by the government.

iii. Runs on banks (significantly huge withdrawals by most depositors at the same time).

iv. Extension of government assistance to financial institution (for example, liquidity support).

2.8.2 Macroeconomic Factors

2.8.2.1 Capital Flows

As was the case in Latin America in the late 1990s, the East Asian crisis in the mid-1990s and the Russian currency of 1998, a sudden halt in or the reversal of capital inflows resulted in the precipitation of their financial turmoil. A sudden halt in or reversal of capital flows particularly in emerging markets triggers interest rate increases, which in turns affects the quality of assets on bank balance sheets (mainly foreign currency denominated loans). A sudden halt of capital flows can also result in a speculative attack on the country's currency. There is a higher likelihood that the monetary authorities will not succeed in defending their currency in the event of a speculative attack on the currency. A slowdown in economic activity is realized which eventually leads to a reduction in credit to productive sectors. In addition, real exchange rate appreciation may be realized and it may render domestic goods

expensive on international markets and may result in a foreign debt crisis due adverse terms of trade.

2.8.2.2 Exchange Rate Regime

Krugman (1979) argues that financial crisis are rife in economies that pursue fixed exchange rate regimes. Similarly, Obstfeld and Rogoff (1995) observe that countries with fixed exchange rate regime are susceptible to speculative attacks on the currency. A speculative attack influences agents switch their holdings to foreign denominated ones leaving the domestic financial system exposed. Eichengreen and Hausman (1999), Hausman et al (1999), and Eichengreen and Rose (1998) have analyzed the correlation of pursuing a certain exchange rate regime to financial fragility. They find varying linkages between the type of exchange rate regime and the likelihood of a financial crisis. In a similar study Dormac and Peria (2000), using an empirical analysis, find that adoption of a fixed exchange rate reduces significantly the probability of a banking crisis occurring. They however, observe that the costs of resolving a financial crisis in an economy that pursued a fixed exchange rate regime is higher.

2.8.2.3 Monetary and Fiscal Policy

Overly expansion of the monetary and fiscal policy may precipitate in lending booms. Banks are tempted to increase their market share by tapping into the increased demand for credit. Critical stages in credit screening may be compromised in the process leading to an accumulation of risky assets by banks, which in the event of a macroeconomic shock, such as an interest rate increase, may pose solvency problems for banks. An overly expansionary monetary policy may result in excessive accumulation of debt and over investment in real estate and equity markets, which

drives up their price to unsustainable levels. The inevitable fall of these prices through correction mechanisms to contain inflation by the authorities or by agents readjusting their external positions may slow down economic activity. Consequently, debt servicing challenges, loss of collateral values and the subsequent increases in non-performing loans may threaten bank solvency.

2.8.2.4 Real Short Term Interest Rates

Real short term interest rates increase bank fragility not only by affecting the proportions of NPLs. However, increases in real short term interest rates may result in the lowering of the earnings potential of banks. An increase in real short term interest rates, for instance, leads to an increase in cost of liabilities. Depositors will require that a higher interest rate is paid for very unit of deposit. However, the asset side of the bank's balance sheet is not easily adjustable because its assets (mainly long term loans) are priced at fixed interest rates resulting in the reduced earnings capability of banks which in turn may result in bankruptcy if losses exceed the bank capital. The homogenous increase of interest rates affects all banks within the financial system leading to a system-wide concern. Even if banks try to match the increased costs of funding their liabilities by increasing lending rates, the problem is not solved but worsened. However, a rate hike by the bank on the lending rates affects the repayment capabilities of borrowers thereby reducing the quality of asses on the bank's balance sheet.

2.8.2.5 Foreign Exchange Risk

Banks are also susceptible to foreign exchange risk when they borrow in foreign currency and facilitate loans on the domestic market in local currency. Adverse movements in exchange rate results in reduced profitability for the bank. However, in

some economies banks raise foreign funds on international markets and make loans on the domestic market denominated in foreign currency. Such an action transfers the foreign exchange risk to borrowers. This does not make the bank immune to financial fragility. Similarly, adverse movements in the exchange rate may affect the borrower's ability to repay their obligation when they fall due. Akerlof and Romer (1993) attribute foreign currency loans problems to the financial chaos in Chile in 1981. Foreign exchange risk was also among the chief determinants of the East Asian crisis of the mid-1997.

2.8.2.6 Financial Liberalization

Globally, financial liberalization began in the late 1980s, and accelerated in the 1990s. It resulted in macroeconomic distortions and volatility, more so, in countries that had weak regulatory and supervisory frameworks. The consequent removal of controls in the financial system led to higher mobility in capital flows while at the same exposing financial institutions to higher and newer risk types. In pursuit for the profit maximization objective, many banks began to borrow in foreign markets and on-lend to unhedged domestic borrowers whose credit risk profiles were unhealthy. Through increased participation in foreign markets, banks assume more currency risk and transform it to credit risk via the credit extension process. Consequently, such a scenario may result in 'twin crises' (Kaminsky and Reinhart, 1999). Deposit insurance schemes may help avoid panic among the banking public but have moral hazard implications. Banks may attract deposits and engage in imprudent activities without fear because they certainly will be bailed out by the government, for example through liquidity support schemes. In addition, deposit insurance schemes may slacken public incentives in monitoring the activities of banks. However, the costs of bank failure are borne by prudent banks, whose management may, in turn, slacken

too. Demirgüc-Kunt and Detragiache (2002) also find that financial liberalization increases the likelihood of a financial crisis occurring.

2.8.3 The Venezuelan Banking Crises on the Mid-1990s[7]

The Venezuelan banking crisis was quite widespread and its fiscal cost was 18 percent of GDP. Poor bank profitability and low GDP growth were some of the major determinants of the banking crises, with solvency, asset quality, and liquidity indicators showing up as significant culprits as well. The loan appraisals were imprudently made in some cases, with the government influencing lending in many occasions.

Prior to the financial liberalization of the Venezuelan banking sector, bank ownership was concentrated in a few individual financial groups. The financial system contained many banks that were largely undercapitalized. Consequently, a large proportion of the financial system became more susceptible to a systemic crisis as banks had very close financial ties with other financial institutions and their parent companies. Financial liberalization opened up the industry to foreign participants, and controlled interest rates and foreign currency transactions were scrapped. In addition, the exchange rate of the Bolivar (their currency) was allowed to float by the Central Bank of Venezuela. The Congress did not however allow these measures to increase competition in the market as their interests within some locally owned institutions would be affected. As a result, interference by Congress made the banking sector more vulnerable to macroeconomic shocks, even though the effect was lagged.

The Congress' interference also constrained the efficiency of the regulatory and supervisory authorities. Furthermore, improper reporting procedures began to surface in the banking sector, further impeding the roles of the financial system and also

[7] The next paragraphs describing the Venezuelan banking crises are drawn from Garcia Herrero (2003)

making the industry prone to a systemic crisis. Lack of consolidated supervision gave the financial groups incentives to divert problems with regards to loans and losses to affiliate companies, especially their offshore subsidiaries. Such imprudence consequently led to lack of competitiveness and inefficiency crept into the banks, resulting in an accumulation of low quality assets. From 1991 to 1992, the stock of bank credit fell from 22 percent of GDP to 16 percent of GDP. In addition to all these mishaps in the banking sector, the political environment became unstable following two attempted coups. The political instability thus further worsened the economic conditions. The unstable economy led to a run away inflation and bank credit to private sector further declined together with an increase in non-performing loans, causing the economy to plunge into a deeper recession.

In January 1994, one of the largest banks in Venezuela, Banco Latino collapsed. The authorities also closed subsidiary institutions of Banco Latino as they were heavily exposed to their parent company. Some of the reasons observed to be responsible for the collapse of Banco Latino were: imprudent lending practices which allowed collateral to be used for multiple loans, poor loan quality, and high concentration of real estate loans.

The closure of Banco Latino created uncertainty in the market, leading to the closure of its subsidiary banks trading firms. The closure was largely prompted by liquidity problems following panic runs by depositors. The widespread runs also led to banks that were otherwise solvent to face liquidity problems due to the high levels of uncertainty that developed in the market. Later that year, Banco Progreso and Banco República became problem banks despite having received substantial financial assistance from the authorities. The authorities decided to close Banco Progreso on the basis of irregular operations in their balance sheets. Banco Republica on the other

hand, was nationalized. In conclusion, the recurring episodes of bank closures in the economy magnified the economic problems of Venezuela as reflected by a slump in real GDP growth by 5 percentage points in 1994.

3 Methodology

3.1 Test for Finance-Growth Nexus

This section presents the theoretical framework to be used in our study. We adopt a three-tier approach for the study's methodology. The first segment tests for finance-growth nexus with particular emphasis on financial sector indicators that best represent the effective financing activity in the economy. We also examine the financial market type that exacerbates or mitigates the effects of a shock on the economic growth. We follow a similar approach to that of Odedokun [1996], where economic growth is given as a function of financial development.

$$Economic \quad Growth = f(Financial \quad Development). \qquad [1]$$

Developing further the model, we consider the neoclassical one sector aggregate production function in which financial development is an important input, hence equation [1] becomes

$$Y_t = f(L_t, K_t, F_t, Z_t), \qquad [2]$$

where Y_t denotes real GDP, L_t is the labor force (employment), K_t is capital stock, F_t stands for the measure of financial development, and Z_t is a vector of other (control) inputs in the production process. By taking the differential of equation [2], manipulating and rearranging the result yields the following expression:

$$\dot{Y}_t = a\dot{L}_t + b\left(I/Y\right)_t + c\dot{F}_t + d\dot{Z}_t \qquad [3]$$

where $\left(I/Y\right)$ represents a share of real gross investment in the real GDP. The dot on top of the variables signify the growth rate forms such that $\dot{Y}_t, \dot{L}_t, \dot{F}_t$ and $\dot{Z}_t$ denote the growth rates of real GDP, the labor force, financial development (intermediation) and the vector of other factors in the production process, respectively. The expression $\left(I/Y\right)$ indicates the channel through which financial intermediation commences its impact on economic growth. By adding the intercept and error terms to equation [3], we arrive at our basic estimable model - equation [4]:

$$\dot{Y}_t = \alpha + a\dot{L}_t + b\dot{K}_t + c\dot{F}_t + d\dot{Z}_{t-1} + \mu_t \quad , \qquad [4]$$

where α the intercept is term and μ_t is the error term so as to satisfy the basic assumptions of OLS regression techniques and Z_{t-1} vector of the control variables lagged once. The effect of financial development on economic growth is ascertained by the magnitude, sign and statistical significance of the 'c' estimate.

3.2 Variable Specification and Data Sources

3.2.1 Financial Development Indicators

Many economists have noted that financial development has a positive relationship with economic growth. Thus, financial development is evidenced by the improvement in the measures that characterize quality, quantity, and efficiency of the financial system. The interactions among various institutions within the financial system are critical for the enhancement of the financial development process. Consequently, these interactions cannot be estimated by one measure of financial development. We therefore construct variables whose specifications capture the

varying characteristics of the financial sector with regards to the type, activity (or liquidity) and structure of the financial system.

The following measures of financial development capture the financial market type aspect. Domestic credit is the total bank credit to the economy as a share of GDP. This measure includes credit to government and public enterprises together with the private sector by banks. Second is domestic private credit which is credit to the private sector from both bank and non-bank financial institutions as share of GDP. This measure excludes extension of credit to government and public enterprises. Similarly, Demirgüc-Kunt and Levine [1999], use claims of deposit money banks on private sector to GDP as a proxy of general bank activity in the private sector. We use public bond and private bond capitalization both as proportions of GDP to capture the impact of this type of financial market on economic activity. To capture the effect of the stock market, we use stock market capitalization as a share of GDP.

Stock market capitalization is measured as the ratio of the value of equities traded on the domestic exchange[s] to nominal GDP. Though this measure of financial intermediation is particularly more significant in developed markets, it shows the contribution of the stock market in providing private credit. Demirgüc-Kunt and Levine [1999] and Levine and Zervos [1998], use stock market capitalization to measure market size. To proxy the combined markets effects, we sum the domestic private market ratio and stock market capitalization ratio. In this measure, we exclude the bond market capitalization as a fair number of countries in our dataset lack such a market. It would thus lead to a fewer observations to run reasonable estimations.

The activity (liquidity) measures we use in this study are as follows. We begin with the activity (liquidity) measures of the credit market. In the literature the provision of financial services is positively related to the size of the financial system.

Hence, to capture this dimension, we ought to take cognizance of the level of monetization of the economy. As a result, we use the ratio of liquid liabilities of the banking system to GDP (depth). Liquid liabilities of the formal banking sector are denoted by M3 or money plus quasi money. Similarly, Zenhui [2000] measures the liquid liabilities of the financial sector as the difference between M2 and total bank deposits. However, the shortcoming of this variable is that it reflects the extensive use of currency rather than an increase in bank transaction deposits (which best represents the extension of loans), thus making this measure less representative of the degree of financial intermediation by the banking institutions. A second measure of activity (liquidity) measure we use is lending to deposit spread. This is the difference between bank lending and deposit rates. Intuitively, the larger the lending to deposit spread [spread] the less efficient the credit market is. An increase in the value of spread above some threshold may indicate an increase in credit risk, which in turn, may result in the deterioration of the quality of the assets on bank balance sheets. Consequently, a high value of the spread may precipitate into significant banking sector problems. Dowling and Zhuang [2002] find that high disparities between the lending rate and the deposit rate signal distress and banking problems

As for the equity market, we use turnover ratio as a liquidity (activity) measure. The turnover ratio is the value of trades of domestic equities on the local exchanges as a share of the stock market capitalization. In other studies, the turnover ratio is used as an efficiency measure. Demirgüc-Kunt and Levine [1996] use it as a liquidity measure of the equity market. We also use stock value traded ratio to measure the value of the equities traded on the local exchanges to GDP. This measure is finer definition of stock market capitalization, which only gives us a relative view of size of the stock market.

As for financial structure, we construct a measure similar to Demirgüc-Kunt and Levine [1999]. We take the natural logarithm of the stock market capitalization ratio to the domestic private ratio. A positive value of this construct signifies that the stock market is more dominant than the credit market in the respective specifications. We summarize the explanatory variables we use in this model in Data Appendix 1.

3.2.2 Control Variables

In models that test for the finance growth relationship, economic growth is measured as the annual growth rate of real GDP. Similarly, we use this measure as our dependent variable. The explanatory variables are as follows:

a. The rate of labor force growth (labor) is proxied by the population growth. We proxy this by calculating the annual growth rate of the population.
b. Inflation (inflation) acts as a cost on investment and therefore having a negative effect on the long run growth [De Gregorio, 1996; Jones and Manuelli, 1993; Fischer, 1993]. As noted by McKinnon [1973] and Shaw [1973], price stability is important for financial intermediation to evolve into the development process. The rate of change of the consumer price index (CPI), proxies the effect of inflation in economic growth. Other studies, for example by Allen and Ndikumana [1998], use the annual percentage change of the GDP deflator as a proxy for inflation.
c. Investment as a share of GDP (invest) is calculated as gross fixed capital formation divided by GDP. Including this variable in the regressions helps take into account the channels through which financial development causes economic growth [Abu-Bader and Abu-Qarn, 2005; Zenhui, 2000]. Furthermore, this variable allows us to test the hypothesis that financial

development increases economic growth through an increase in investment.

d. Openness of the economy (trade) is given by the lagged sum of exports and imports of goods and services as a percentage of GDP. Exports contribute to overall economic growth through the foreign exchange generation, which in turn maybe used to purchase capital goods. Conversely, openness of the economy may be hazardous to the economy with regards to reversal of capital flows [Allen and Ndikumana, 1998]. This variable thus allows us to test, empirically, the effects of openness to international trade on the host economy.

e. Budget deficit or surplus (budget), lagged one year, weighs heavily on the growth prospects of the economy by crowding out private investment. In addition, the financing of budget deficits through for instance, seignorage, may induce inflationary pressure whose effects have already been discussed in [c]. Furthermore, high fiscal deficits may raise the likelihood of the occurrence of a financial crisis as a result of the loss of investor confidence [Demirgüc-Kunt and Detragiache, 1998].

f. To control for the legal effect on economic growth, we construct a dummy variable that takes the value of 1 for English origin, 2 for French origin, and 3 for Germany and Scandinavian origin. As espoused by La Porta et al [1997], a strong higher quality of legal enforcement may trigger higher economic growth.

g. We construct a crisis dummy variable, $crisis_{i,t}$, that controls for the occurrence of banking crisis using a recent study by Caprio and Klingebiel [2003]. We assign the variable a value of one when a crisis occurs and

zero otherwise. The variable $crisis_{i,t}$ becomes the dependent variable in the second segment of our analysis (the logit model) discussed in the next section. Our sample includes both industrialized and emerging market economies that have experienced episodes of systemic banking crisis during 1986-2005. However, countries that have not experienced systemic banking problems act as controls in the analysis. Caprio and Klingebiel [1996] find that most banking crises of a systemic nature occurred during this period hence making our study period more germane for the analysis we conduct here.

h. We formulate an income group dummy based World Bank's income classification of different countries using per capita income as the benchmark. It allows us to test for the finance-growth nexus controlling for income levels. The income group dummy variable takes the value of 1 for Low Income, 2 for Middle Income, and we merge High Income: Non OECD and High Income: OECD to form the High Income group and is denoted by 3.

3.3 Test for Macro-Determinants of Financial [Banking] Crisis

In the second segment of our analysis, we investigate the macroeconomic and institutional determinants of banking crisis using a multivariate logit model. In this model, we assume that the occurrence of a banking crisis is a uniform event, though in reality, however, episodes of banking crises are of relative magnitudes. Thus, using macroeconomic, banking sector, external variables, and institutional variables, we test for the extent to which these variables lead to or foster systemic banking crises.

In estimating the multivariate logit model, we follow Demirgüc-Kunt and Detragiache [1998], who use a logistic probability model. Using this model of

banking crises, we can test the hypothesis that shocks in the macroeconomic and institutional environments have an impact on the banking sector's fragility even when other factors are controlled for. Thus, we estimate the probability that a systemic banking crisis will occur at time t, in some country i, given the pertinent variables mentioned above.

We let "$\text{crisis}_{i,t}$" denote a dummy variable taking the value of one when a banking crisis occurs in country i at time t, and zero if otherwise. $X_{i,t}$ denotes the vector of the explanatory variables. Some of these variables are defined in the preceding section. β is the vector of n unknown coefficients. Lastly, $F[\beta' X_{i,t}]$ is the cumulative probability distribution function evaluated at $\beta' X_{i,t}$. Formally, we specify our model as follows:

$$\Pr ob(Crisis) = f(X_{i,t}) \quad [6]$$

$$\Pr ob(No\ Crisis) = f(X_{i,t}) \quad [7]$$

Equation [6] and [7] show that the probability of a crisis or no crisis occurring is a function of the explanatory variables such as the measure of financial development, external variables and other domestic macroeconomic variables.

$$\Pr ob(crisis = 1 \mid \alpha, \beta\ 'X_{i,t}) = \frac{e^{\beta\ 'X_{i,t}}}{1 + e^{\beta\ 'X_{i,t}}} = F(\alpha + \beta\ 'X_{i,t}) \quad [8]$$

$$\Pr ob(No\ crisis = 0 \mid \alpha, \beta\ 'X_{i,t}) = \frac{1}{1 + e^{\beta\ 'X_{i,t}}} = 1 - F(\alpha + \beta\ 'X_{i,t}) \quad [9]$$

where α, is the intercept term, and

$$F(x) = \frac{1}{1 + e^{-x}} \quad [10]$$

is the function of the logistic distribution function. Thus, the conditional probability function involved, with y denoting crisis is

$$f(y \mid \alpha, \beta\ 'X_{i,t}) = F(\alpha\ + \beta\ 'X_{i,t})^{y}\left[(1-F)(\alpha\ + \beta\ 'X_{i,t})\right]^{1-y}$$
$$= F(\alpha\ + \beta\ 'X_{i,t}) \qquad if \quad y = 1 \qquad [11]$$
$$= 1 - F(\alpha\ + \beta\ 'X_{i,t}) \quad if \quad y = 0$$

Transforming equation [6] and [7] into conditional probability equations yields equations [8] and [9] respectively. Taking equation [8] and dividing it by equation [9] gives us the odds ratio in favor of a crisis. We take natural logs of the odds ratio and linearize it in $X_{i,t}$ and the parameters of β. Such manipulation yields equation [12] shown below.

$$\ln \frac{\Pr ob(crisis = 1 \mid \alpha, \beta\ 'X_{i,t})}{\Pr ob(No\ crisis = 0 \mid \alpha, \beta\ 'X_{i,t})} = \alpha + \beta\ 'X_{i,t} \qquad [12]$$

Manipulation of equation [11] yields our final estimable log likelihood function of the model as follows:

$$Ln\ L = \sum_{t=1..T} \sum_{i=1..n} \left\{ CRISIX_{i,t} \quad \ln[F(\beta' X_{i,t}) + (1 - CRISIX_{i,t}) \ln\left[1 - F(\beta' X_{i,t})\right]\right\} \quad [13]$$

A positive β reflects that the explanatory variable will increase the likelihood of a banking crisis. On the other hand, a negative β shows that the explanatory variable will reduce the likelihood of a banking crisis occurring.

Explanatory Variables Data Sources

In our logit specification $X_{i,t}$ is matrix of the explanatory variables of banking crisis. Variables in the $X_{i,t}$ matrix reflect the theory of the determinants of banking crisis. Our dependent variable is banking crisis dummy variable which is explained in preceding section. We provide a detailed list of the explanatory variables that we use in this section in the Data Appendix 2. We test our model using three categories of variables – the macroeconomic environment, financial, and institutional variables. Among the macroeconomic variables we include real interest rate, inflation, terms of

trade, real growth of GDP, percentage change in the exchange rate between the local currency and the US dollar, and budget surplus (deficit).

Adverse shocks on the macro environment have been found to be related the occurrence of banking crisis. This is largely through increasing credit risk (risk of being unable to repay debt obligations). We thus expect that an increase in real GDP will reduce the likelihood of a banking crisis. Shocks that occur to the economy are easily absorbed by real output expansion hence the financial sector is less vulnerable to them in expansionary times.

High real interest rates hurt bank performance by not only increasing the proportion of NPLs but may result in rationing of the earning potential of banks. Increasing real interest rates is unfavorable for bank balance sheets the liabilities and assets are of different terms to maturity. High inflation is related with high nominal interest rates and may proxy for macroeconomic mismanagement [Demirgüc-Kunt and Detragiache, 1998 and Dormac and Peria, 2000].

We introduce a variable that captures the external conditions that may result in banking sector fragility – change in terms of trade. As explained in section in the above section. A deterioration in the terms of trade results in increased credit risk of borrowers, thus increasing the likelihood of a banking crisis. Deteriorating terms of trade may affect the balance of payment positions negatively as more foreign currency outlays are needed for imports per unit value of exports.

We use budget surplus (deficit) to capture the financing needs of the government. High fiscal deficits may raise the likelihood of the occurrence of a banking crisis as a result of the loss of investor confidence [Demirgüc-Kunt and Detragiache, 1998]. A high public sector borrowing ratio may crowd out private investment thereby reducing real growth rate of economic output. Demirgüc-Kunt and

Detragiache [1998] argue that a cash strapped government may elect to postpone corrective measures in banks which may breed a small problem into a systemic one. Thus budget surplus (deficit) may capture the inefficiency of government economic management.

When banks enter international markets to raise funds to lend on the domestic market in the local currency it is faced with foreign exchange risk. Similarly, domestic borrowers are faced with foreign exchange risk when a bank lends them foreign denominated loans. Adverse movements in the exchange rate will in both cases will increase the likelihood of banking sector problems. To capture this mechanism we use the percentage change in the exchange rate (value of local currency per US dollar).

We then modify our estimable model to include financial variables. Financial liberalization is argued in the literature that it played a significant role in determining financial crisis. Financial liberalization is argued to weaken bank balance sheets through the increase in loanable funds that result in excessive risk taking by banks and in some instances result in fraud by bankers. A number of studies have identified that banking crisis are preceded by lending booms. We thus include the growth rate of the ratio of credit to private sector to GDP to control for this mechanism. The literature is not explicit on the exact periods before the onset of financial crisis are characterized by high credit growth thus we experiment different lags of these constructs.

Following the generation models authored by Krugman [1979], financial crisis are found to be a result of speculative behavior which leads to a depletion of foreign exchange reserves. In the East Asian financial crisis of the mid-1990's economists attribute excessive accumulation of external debt to reserves. In similar studies, short term debt to reserves is used as a vulnerability indicator and find it to be more robust

than the construct that has a monetary aggregate to reserves, such as M2/Reserves, [for example see Demirgüc-Kunt and Detragiache, 1997 and 1998]. We therefore use reserves to external debt to capture the same mechanism. A lower value of this construct is expected to be related to a banking crisis.

We then include institutional variables to the specification to control for the income level, quality of regulation of the financial system, openness of the banking system, bureaucracy and institutional effectiveness. Dormac and Peria [2002] and Demirgüc-Kunt [1997, 1998] argue that poor countries have inefficient legal systems, weak contract enforcement infrastructures, and inadequate financial system supervision and regulation further magnifying crevices within the financial system. We thus introduce institutional variables stated above to control for the quality of the government's ability to effectively administer the economy. A summary of the explanatory variables we employ in the section are given in Data Appendix 2.

3.4 Test for Firm-Specific Determinants of Banking Crisis

The third segment of the study, we use the logistic model explained in section 2 of the methodology but for bank specific variables. From our base sample we focus on developing countries that experienced systemic banking crisis. The main data source for annual bank specific variables is the Bureau van Dijk's BankScope database. The logit model would thus, allow us identify the causes of the banking crises in developing economies and also assist in recommending adjustment of the prudential policy and regulatory framework of the banking sector.

We use the following variables to examine the bank specific determinants of a banking crisis in developing countries:

i. Capital to asset ratio (cap_ass) shows the capitalization extent of the bank to cushion against credit risk. Bank regulators may impose hefty fines on banks

that are not capitalized as per its requirement. As a result, under-capitalized banks may obtain more capital, reduce their assets or both, to meet the capital requirements. More recently, regulators have been proposing that banks merge or to consolidate their activities under a single license to meet the stipulated capital levels.

ii. Net interest income to earning assets (nii_eass) reflects the contribution of a unit value of earning assets to the net interest income. Earning assets are comprised of loans and investments (excluding equity investments).

iii. The ratio of operating expenses to earning assets (opex_eass) shows the coverage of the operating expenses by the earning assets. This ratio may also be an indicator of management performance. A well run bank may seek to minimize operating expenses in the face macroeconomic volatility through streamlining their activities or laying off some staff.

iv. A loan to marketable securities ratio (lon_mksec) shows the profitability strategy of the bank. A lower ratio shows the low credit to borrowers due to macroeconomic environment, for instance, very volatile interest rate rates may lead banks to reduce their loanable funds as they may become costly to fund. Prudent managers would thus seek to reduce their loan portfolios in a volatile environment and seek to increase investments and securities to loans which may become non-performing in such an environment.

v. Loans to deposit ratio (lon_dep) denotes the proportion of loans that are funded by deposits. This ratio also indicates the ability of the bank to keep on underwriting loans.

vi. Deposits to total liabilities ratio (dep_liab) shows the proportion of deposits total liabilities. A very huge deposit to liabilities ratio may indicate the

strategy of the bank. The bank may be targeting a very huge low cost deposit market share to drive up their franchise value.

vii. Provision for loan losses to total loans (pll_lon) may indicate the previous performance of the loan portfolio. An increase in this value may suggest that previously, more loans became non-performing.

viii. Demand deposits to total deposits (dd_tdep) indicate the proportion of demand deposits to total deposits. Demand deposits may make a bank more prone to a run as they can be called on any time. In the event of a negative perception by the public on the bank or the banking system, a bank with large proportion of demand deposits is likely to face more liquidity constrains.

ix. Securities and investments to total assets ratio (sec_inv_ass) indicates the proportion of market securities and investments to total assets. As observed earlier, in a highly unstable macro environment, it will be more prudent to accumulate more marketable securities, such as treasury bills, which have little or no credit risk compared to loans, for example.

3.5 Data Sources

For the first and second segments of our analysis, the World Development Indicators of the World Bank and International Financial Statistics (IFS) databases of the IMF serve as the main sources of our data for the period under study. Due to paucity of data for sample countries, some observations in our sample do not entirely cover the period under study. In the third part of our analysis, we use Bureau van Dijk's BankScope database.

4 Results

4.1 Empirical Results

This section presents the results of our findings. We begin by reporting the results of the *Finance-Growth Nexus* section of our methodology. Table 5 shows the descriptive statistics for the explanatory variables we employ in our analysis. Measures of financial development are included together with the control variables. Throughout the analysis, these variables are used in their growth form with the exception of the investment channel as specified in the methodology.

Table 5: Descriptive Statistics (1986-2005)

Variable	Obs	Mean	Std. Dev.	Min	*Max*
Domcredit	1213	0.0201957	0.2069141	-1.0539	1.9305
Dompcredit	1217	0.000778	0.3090857	-4.2685	2.8844
Bankass	1228	0.4719928	0.3696183	0.0001	2.584161
Stmktcap	841	0.1439001	0.3728225	-1	2.8779
Pubond	419	0.0602523	0.1954896	-0.5009	1.1878
Prbond	373	0.1086303	0.2982221	-0.8549	1.6496
Dompvtcredit+Mktcap	830	0.1625542	0.4385758	-1.5772	3.0552
Depth	1153	0.0188389	0.1082746	-1	0.7799
Spread	775	0.013365	0.5040935	-3.7206	3.5914
Stturnover	824	0.1652682	0.6912102	-0.9896	4.7817
Stvaluetraded	858	0.3780887	1.042091	-1	6.8512
Mktcap/Bankass	428	-1.700543	1.229329	-8.471841	1.020257
Invest	1291	0.2202175	0.0754696	0.053	0.6445
Labor	1318	0.0163691	0.0099725	-0.0108	0.0612
Inflation	1140	0.1421815	1.165431	-4.5162	10.7483
Trade	1152	0.0260722	0.1141814	-0.5687	0.8898
Budget	746	0.1870599	3.711331	-14.243	30.899

Table 6 shows the correlation matrix for the explanatory variables. A weak relationship exists between most pair-wise variables justifying our basis to use different constructs of financial development. The different financial development measures we use in this paper capture different characteristics of the financial system.

Table 6: Correlation Matrix for the Explanatory Variables

	Domcredit	Dompcredit	Bankass	Stmktcap	Pubond	Prbond	Dompvtcredit +Mktcap	Depth	Spread	Stturnover	Stvalue Traded	Mktcap/ Bankass	Invest	Labor	Inflation	Trade	Budget
Domcredit	1.0000																
Dompcredit	0.2987*	1.0000															
Bankass	0.0235	-0.0130	1.0000														
Stmktcap	0.0320	0.1056*	0.0539	1.0000													
Pubond	-0.0319	-0.1592*	-0.1513*	0.1142*	1.0000												
Prbond	-0.0027	0.0186	-0.0750	0.3446*	0.2509*	1.0000											
Dompvtcredit+Mktcap	0.2713*	0.5309*	0.0630	0.8988*	0.0008	0.2899*	1.0000										
Depth	0.1803*	0.1395*	0.0380	-0.0073*	-0.1466*	0.0899	0.0426	1.0000									
Spread	0.0400	0.0216	-0.0375	0.0205	-0.0064	-0.0127	0.0024	-0.0605	1.0000								
Stturnover	0.0249	0.0489	0.0447	0.0870*	-0.0959	-0.0760	0.0967*	0.0923*	-0.0825	1.0000							
Stvalue Traded	0.0164	0.0723*	0.0731*	0.5085*	-0.0532	0.0920	0.4779*	0.0491	-0.0471	0.8324*	1.0000						
Mktcap/ Bankass	0.0540	0.0729	-0.1336*	0.6788*	0.1249	0.2126*	0.6226*	-0.0426	0.1002	0.0536	0.3181*	1.0000					
Invest	0.0625*	-0.0743*	0.0183	0.0016	-0.0615	0.0567	0.0210	0.0096	-0.0732*	-0.0141	0.0147	0.0147	1.0000				
Labor	-0.0084	0.0028	-0.0236	0.0420	-0.0534	0.0688	0.0392	-0.0581*	-0.0242	0.0719*	0.0731*	0.1499*	-0.2058*	1.0000			
Inflation	-0.0571	-0.0221	-0.0203	-0.0072	-0.0778	0.0763	-0.0315	-0.1055*	-0.0204	-0.0383	-0.0231	0.0864	-0.0514	0.0013	1.0000		
Trade	-0.0561	-0.0674*	-0.0156	-0.0584	-0.1175*	-0.1137*	-0.0961*	0.0158	-0.0696	0.0817*	0.0403	0.0883	0.0078	0.0269	0.0227	1.0000	
Budget	-0.0046	0.0309	0.0169	-0.0082	0.0109	0.0639	-0.0444	-0.0375	-0.0078	0.0050	0.0146	0.1302	-0.0541	0.0763*	0.0059	0.0127	1.0000

* indicates significance at the 5% level or better.

The overall correlation between measures of financial development and real GDP growth are given in Table 7. Generally, the measures of financial development have a positive correlation with *Real GDP growth* and are significant at 5% level. This is in line with previous works by Odedokun (1994), Demirgüc-Kunt and Levine (1999) and Levine (1997). We also found that *Domestic credit* and *Public bond capitalization*, both in which government has a significant influence, have a negative relationship with economic growth and are statistically significant at 1%. *Domestic private credit* has a positive relationship with economic growth which however is not statistically significant. Bank Assets to GDP (*Bankass)*, a proxy for the credit market size, has a positive and significant relationship with economic growth. Similarly, the proxy for the equity market size, *Stock Market Capitalization* is positively related to *Real GDP growth* and is statistically significant at 1%. In most economies, the combined effect of the stock market and domestic private credit (*DomPvtCredit+Mktcap*) yields a positive relationship with economic growth that is significant at 5%.

Table 7: Correlations of Financial Development Measures to Real GDP Growth

Financial Development Measure*	Coefficient	P-Value
Domestic Credit	-0.1248	0.0000
Domestic Private Credit	0.0135	0.6388
Bankass	0.0636	0.0376
Public Bonds	-0.2949	0.0000
Private Bonds	0.0044	0.9329
Stock Market Capitalization	0.1313	0.0001
DomPvtCredit+Mktcap	0.1284	0.0002
Depth	0.0123	0.6781
Spread	-0.1161	0.0013
Stturnover	0.0771	0.0269
Stvaluetraded	0.1281	0.0002
Mktcap/Bankass	-0.0202	0.6771

* Financial development measures are in their growth form.

The results of this section were arrived at using panel data techniques. In most analysis of this nature, the fixed effects panel data models are often used compared to random effects models. The selection of the model to use generally depends on the assumptions we make concerning the error term. The fixed effects model assumes that the individual specific

residuals are fixed. However, the random effects model assumes individual error components to be random. In our analysis, we assume that the individual error terms are not random and hence we employ the fixed effects model. We also perform the Hausman test to assess the appropriateness of our fixed effects model. The results of the test confirm the suitability of our model. Table 8 shows the results for both the fixed and random effects models whose results we then use to perform the Hausman test. Fixed effects model are not without their disadvantages. Too many dummy variables, for instance, result in lose of degrees of freedom for adequately powerful statistical tests (Yaffee, 2003). In addition, use of many dummy variables may result the explanatory variables to suffer from multicollinearity which also saps the model of degrees of freedom. However, the random effects model allows for the estimation of several variables without loss sufficient degrees of freedom for adequately powerful statistical tests.

Table 8: Fixed Effects Model versus the Random Effects Model

	Fixed Effects Model			**Random Effects Model**		
	Dompcredit	**Spread**	**Mktcap/Bankass**	**Dompcredit**	**Spread**	**Mktcap/Bankass**
F_{dvt}	0.0044	-0.0023	-0.0009	0.0067	-0.0029	0.0000
	(0.95)	(-0.71)	(0.46)	(1.51)	(-0.95)	(0.01)
Invest	0.1521	0.1260	0.2952	0.1584	0.1894	0.2781
	(3.88)***	(2.38)**	(4.08)***	(7.02)***	(5.38)***	(7.15)***
Labor	0.7504	0.8764	0.4176	0.6502	0.7135	0.1260
	(2.13)**	(1.91)*	(0.49)	(3.41)***	(2.70)***	(0.45)
Inflation	0.0003	0.0008	0.0018	0.0002	0.0005	0.0017
	(0.23)	(0.52)	(0.93)	(0.19)	(0.32)	(1.01)
Trade	0.0541	0.0423	0.0609	0.0534	0.0424	0.0616
	(3.93)***	(2.62)***	(2.75)***	(3.97)***	(2.67)***	(2.97)***
Budget	-0.0003	-0.0004	0.0009	-0.0004	-0.0006	0.0001
	(-0.66)	(-0.97)	(1.02)	(-1.18)	(-1.44)	(0.07)
F	(6,11)	(6,373)	(2,216)			
	7.24	3.69	4.83			
Prob>F	0.000	0.001	0.000			
Wald X2 (6)				75.44	48.31	61.69
Prob>X2				0.000	0.000	0.000
N	675	422	247	675	422	247

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 9 summarises the results of the regression of equation (4) in the methodology. We first estimate this model for the whole panel which includes 66 countries from 1986 to 2005. From these results, we observe that the credit and equity market types of the financial market are important in fostering positive economic growth. The results also confirm the importance of the combined effect of the equity and credit markets on economic growth. The financial development measures that proxy activity also confirm the theoretical postulation that there is positive relationship between increased financial activity and economic growth.

Similar to Levine's (2002) findings, we find that the market structure is no evidence to support the relevance of market structure to economic growth. The construct of market structure yields a negative coefficient which is not statistically significant for the overall sample. It should be noted that a positive coefficient for this variable signifies dominance of the equity market and a negative coefficient confirms the dominance of the credit market in bringing about economic development. The negative sign confirms the theory which identifies banks to be more influential in efficiently allocating credit for most economies.

Among the control variables, *trade* is found to be positively related to economic growth. Again, this finding is in line with the literature. The conduit through the financial development (*invest*) impacts on economic growth is generally positive and highly statistically significant. However, in the overall estimations *budget deficit* and *inflation* are not statistically important.

Table 9: Relationship of Financial Development to Economic Growth

$$\text{Re}\, al\ GDP\ Growth = \beta_0 + \beta_1 \mathrm{F_{DVT}} + \beta_2\, invest + \beta_3\, labor + \beta_{4_{t-1}}\, inflation + \beta_5\, trade_{t-1} + \beta_6\, budget_{t-1}$$

	$\mathbf{F_{DVT}}$	**Invest**	**Labor**	**Inflation**	**Trade**	**Budget**	**Prob > F**	**N**
	-0.0238	0.1716	0.8194	0.0000	0.0498	0.0000	0.000	672
Domestic Credit	(-3.57)***	(4.40)***	(2.32)**	(-0.01)	(3.71)***	(-0.40)		
Domestic Private	0.0044	0.1516	0.7504	0.0003	0.0541	-0.0003	0.000	675
Credit	(0.95)	(3.88)***	(2.13)**	(0.23)	(3.93)***	(-0.66)		
	-0.0406	0.2117	0.5767	-0.0008	0.0246	0.0009	0.000	228
Public Bonds	(-3.47)***	(2.89)***	(0.49)	(-0.42)	(0.82)	(1.33)		
	-0.0159	0.3598	1.13995	-0.0002	-0.0208	0.0010	0.000	196
Private Bonds	(-1.86)*	(4.71)***	(0.81)	(-0.09)	(-0.72)	(1.11)		
Stock Market	0.0142	0.2331	0.6467	0.0007	0.0390	-0.0003	0.000	483
Capitalization	(3.37)***	(4.41)***	(1.23)	(0.48)	(2.34)**	(-0.48)		
Dompvtcredit+	0.0115	0.2173	0.7115	0.0010	0.0409	-0.0003	0.000	478
Mktcap	(3.14)***	(4.08)***	(1.36)	(0.66)	(2.44)**	(-0.14)		
	0.0087	0.1539	0.7542	0.0004	0.0522	0.0000	0.000	646
Depth	(0.61)	(3.84)***	(2.10)**	(0.29)	(3.68)***	(-0.63)		
	-0.0023	0.1260	0.8764	0.0008	0.0423	-0.0004	0.001	490
Spread	(-0.71)	(2.38)**	(1.91)*	(0.52)	(2.62)***	(-0.97)		
	0.0045	0.2291	0.8728	0.0006	0.0290	-0.0003	0.000	469
Stturnover	(1.96)*	(4.28)***	(1.69)*	(0.45)	(1.67)*	(-0.60)		
	0.0040	0.2414	0.6025	0.0007	0.0272	-0.0005	0.000	490
Stvaluetraded	(2.65)***	(4.56)***	(1.20)	(0.50)	(1.63)	(-1.07)		
	-0.0009	0.2952	0.4176	0.0018	0.0609	0.0009	0.000	247
Mktcap/Bankass	(-0.46)	(4.08)***	(0.49)	(0.93)	(2.75)***	(1.02)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

We then analyzed the effect of the investment transmission channel on financial market type in the promotion of economic growth. Table 10 summarizes the results of the financial market type independently and the interaction between the financial market type and the channel through which economic growth is prompted. The results show that the investment transmission channel is important in the fruition economic growth. As standalones, *Domestic Credit* and *Public Bond*, which both have government involvement, have a sign transformation from negative to positive after the interaction. The enhancement of the investment transmission channel is confirmed also by the S*tock Market Capitalization* and the combined effect of the *Stock Market* and *Domestic Private Credit Market* results. Whether the market is bank-based or market-based does not matter through the investment transmission channel. The market structure coefficient in this specification yields an expected negative sign even though it lacks statistical significance.

Table 10: Financial Development Types Interacted with the Investment Channel

$$Real\ GDP\ Growth = \beta_0 + \beta_1 F_{DVT} + \beta_2 invest + \beta_3 labor + \beta_{4_{t-1}} inflation + \beta_5 trade_{t-1} + \beta_6 budget_{t-1} + \beta_7 (F_{DVT} * invest)$$

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	F_{DVT}*Invest	N
	-0.0570	0.1646	0.8223	-0.0002	0.0514	-0.0002	0.1541	672
Domestic Credit	(-2.92)***	(4.20)***	(2.33)**	(-0.15)	(3.78)***	(-0.20)	(1.81)*	
Domestic Private Credit	0.0031	0.1524	0.7499	0.0003	0.0540	-0.0003	0.0033	675
	(0.26)	(3.88)***	(2.12)**	(0.23)	(3.91)***	(-0.67)	(0.12)	
	-0.1664	0.2453	0.3963	-0.0007	0.0170	0.0007	0.5989	228
Public Bonds	(-4.36)***	(3.41)***	(0.34)	(-0.38)	(0.58)	(1.06)	(3.46)***	
	-0.0577	0.3339	1.0661	0.0000	-0.0224	0.0010	0.2086	196
Private Bonds	(-1.54)	(4.20)***	(0.76)	(-0.01)	(-0.78)	(1.09)	(1.14)	
Stock Market Capitalization	-0.0279	0.19123	0.6304	0.0006	0.0391	-0.0003	0.1959	483
	(-1.82)*	(3.52)***	(1.21)	(0.40)	(2.37)**	(-0.49)	(2.85)***	
	0.0884	0.1471	0.7885	0.0002	0.0529	-0.0002	-0.4481	645
Depth	(2.16)**	(3.66)***	(2.20)**	(0.18)	(3.67)***	(-0.45)	(-2.08)**	
	-0.0068	0.1266	0.8695	0.0008	0.0423	-0.0004	0.0260	422
Spread	(-0.59)	(2.38)**	(1.89)*	(0.52)	(2.61)***	(-0.98)	(0.40)	
	0.0042	0.2290	0.8728	0.0006	0.0291	-0.0003	0.0014	469
Stturnover	(0.42)	(4.25)***	(1.68)*	(0.45)	(1.67)	(-0.60)	(0.03)	
	0.0011	0.2371	0.5956	0.0007	0.0274	-0.0005	0.0131	490
Stvaluetraded	(0.18)	(4.45)***	(1.18)	(0.49)	(1.65)*	(-1.06)	(0.48)	
Dompvtcredit+ Mktcap	-0.0276	0.1754	0.7031	0.0008	0.0401	-0.0003	0.1810	478
	(-2.04)**	(3.22)***	(1.36)	(0.56)	(2.42)**	(-0.50)	(3.00)***	
	-0.0072	0.3332	0.3884	0.0017	0.0611	0.008	0.0292	247
Mktcap/Bankass	(-0.91)	(3.89)***	(0.46)	(0.89)	(2.76)***	(0.92)	(0.83)	

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively
All models are significant at 1%.

For robustness tests, we control for volatility by linearizing the financial development measures and the investment channel. The results remain unchanged overall except for a slight prop up in the coefficients. We conduct a similar analysis for the intercepts and slopes of the models. The results are robust with the investment interaction increasing the importance of the financial development measures. These results are reported in Table 11. The negative coefficient for *Stock Market Capitalization* suggests that the volatility of stock markets may discourage growth in the long run.

Table 11: Financial Development Type Interacted with the Investment Channel Controlling for Market Volatility

	F_{DVT}	invest	labor	inflation	trade	budget	F_{DVT}* invest	$varF_{DVT}^{\pi}$	$varInvest^{\pi}$	N
	-0.0628	0.1963	0.8734	-0.0001	0.0494	-0.0002	0.1337	0.0153	-0.1573	672
Domestic Credit	(-3.19)***	(4.29)***	(2.47)**	(-0.10)	(3.63)***	(-0.51)	(1.56)	(1.84)*	(-0.95)	
Domestic Private Credit	0.0032	0.1692	0.7576	0.0004	0.0531	-0.0003	0.0025	-0.0002	-0.1226	675
	(0.23)	(3.72)***	(2.14)**	(0.28)	(3.82)***	(-0.68)	(0.07)	(-0.07)	(-0.72)	
	-0.2030	0.1604	0.3258	-0.0010	0.0183	0.0008	0.7590	0.0046	0.8400	228
Public Bonds	(-3.40)***	(1.69)*	(0.28)	(-0.52)	(0.62)	(1.13)	(3.22)***	(0.19)	(1.37)	
	-0.0555	0.4039	1.1362	0.0001	-0.0229	0.0009	0.1906	0.0014	-0.5185	196
Private Bonds	(-1.29)	(3.19)	(0.80)	(0.04)	(-0.78)	(0.99)	(1.00)	(0.09)	(-0.73)	
Stock Market Capitalization	-0.0257	0.1445	0.5716	0.0005	0.0403	-0.0002	0.2095	-0.0069	0.6237	483
	(-1.61)	(2.30)**	(1.10)	(0.32)	(2.44)**	(-0.45)	(3.01)	(-1.53)	(1.43)	
	0.0758	0.1730	0.8140	0.0003	0.0517	-0.0002	-0.4173	-0.0198	-0.1892	646
Depth	(1.34)	(3.69)***	(2.27)**	(0.21)	(3.57)***	(-0.51)	(-1.53)	(-0.57)	(-1.06)	
	-0.0070	0.1275	0.8659	0.0008	0.0422	-0.0004	0.0275	0.0001	-0.0259	422
Spread	(-0.56)	(2.35)**	(1.87)**	(0.52)	(2.58)***	(-0.98)	(0.39)	(0.07)	(-0.07)	
	0.0154	0.1836	0.8835	0.0007	0.0304	-0.0004	-0.0227	-0.0033	0.5987	469
Stturnover	(1.42)	(2.96)***	(1.71)*	(0.48)	(1.75)*	(-0.71)	(-0.49)	(-2.29)**	(1.33)	
	0.0046	0.2168	0.4814	0.0008	0.0264	-0.0005	0.0281	-0.0024	0.3143	490
Stvaltraded	(0.74)	(3.60)***	(0.96)	(0.57)	(1.60)	(-1.13)	(1.04)	(-3.43)***	(0.71)	
DomPvtCredit+ MktCap	-0.0268	0.1253	0.6445	0.0007	0.0424	-0.0002	0.1950	-0.0042	0.6472	478
	(-1.94)*	(2.00)**	(1.24)	(0.49)	(2.55)**	(-0.44)	(3.21)***	(-1.35)	(1.49)	
	-0.0059	0.3812	0.5444	0.0019	0.0578	0.0008	0.0224	-0.0003	-1.0068	247
MktCap/Bankass	(-0.74)	(4.19)***	(0.64)	(0.97)	(2.60)***	(0.84)	(0.63)	(-0.31)	(-1.67)*	

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively
All models are significant at 1%.
$^{\pi}$ $varF_{DVT}$ and varInvest are the linearize component of financial development measures and the investment channel.

We then investigated the impact of the measures of financial development on economic growth under different legal environments. We report our findings for the *English, French* and *German and Scandinavian* legal origin combined. In our sample most countries' legal foundations are largely English and French based. However, our analysis shows that the *French* legal origin supports most financial market types. The financial activity measures are also more robust under the *French* legal origin. Under the *French* legal origin, we found that the financial market structure matters in fostering economic growth. The *Stock Market* under this legal origin is more dominant in spawning economic growth. Table 14 shows weak evidence for the *Germany and Scandinavian* legal setting supporting any financial development measure in the growth process. We however find the stock market to be the

more important financial market type that promotes economic growth within the *German and Scandinavian* legal environments.

Table 12: Legal Effect on the Finance-Growth Nexus -English Civil Origin

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	Prob>F	N
	-0.0122	0.1103	0.3404	-0.0014	0.0304	-0.0007		
Domestic Credit	(-1.49)	(2.56)**	(0.81)	(-0.69)	(1.52)	(-1.44)	0.017	310
Domestic Private	0.0025	0.1014	0.2846	-0.0010	0.0323	-0.0008		
Credit	(0.54)	(2.37)**	(0.69)	(-0.51)	(1.58)	(1.68)*	0.031	311
	0.0123	0.2920	0.1784	-0.0013	0.0729	-0.0006		
Public Bonds	(0.66)	(3.51)***	(0.14)	(-0.40)	(1.57)	(-0.74)	0.010	100
	-0.0272	0.3628	-0.0881	-0.0001	0.1070	-0.0011		
Private Bonds	(-1.63)	(4.37)***	(-0.06)	(-0.02)	(1.69)*	(-0.69)	0.001	86
	0.0289	0.2183	-0.2305	0.0016	0.0255	-0.0008		
Stock Market	(4.58)***	(3.66)***	(-0.38)	(0.75)	(1.03)	(-1.25)	0.000	209
	0.0223	0.1968	-0.1323	0.0021	0.0278	-0.0009		
Dompvtcredit+Mktcap	(3.74)**	(3.23)***	(-0.21)	(0.96)	(1.10)	(-1.36)	0.000	205
	-0.0005	0.1073	0.3143	-0.0014	0.0288	-0.0008		
Depth	(-0.03)	(2.49)***	(0.77)	(-0.67)	(1.39)	(-1.76)*	0.029	304
	0.0033	0.0430	0.3808	-0.0014	0.0352	-0.0008		
Spread	(0.75)	(0.76)	(0.77)	(-0.68)	(1.54)	(-1.65)	0.200	214
	0.0014	0.2087	0.0525	0.0014	0.0295	-0.0009		
Stturnover	(0.48)	(3.25)***	(0.08)	(0.61)	(1.12)	(-1.44)	0.014	205
	0.0039	0.2090	-0.0547	0.0012	0.0258	-0.0011		
Stvaluetraded	(2.01)**	(3.42)***	(-0.09)	(0.53)	(1.03)	(-1.92)*	0.002	214
	0.0009	0.1740	-1.2327	0.0016	0.0862	-0.0024		
Mktcap/Bankass	(0.42)	(2.73)***	(-1.21)	(0.45)	(3.12)***	(-1.98)*	0.001	95

t-statistics are in parenthesis.
*, **, *** show levels of significance at 1%, 5% and 10% respectively

Table 13: Legal Effect on the Finance-Growth Nexus - French Civil Origin

	F_{DVT}	Invest	labor	inflation	Trade	budget	Prob>F	N
	-0.0410	0.3076	1.4313	0.0014	0.0503	0.0008	0.00	298
Domestic Credit	(-3.46)***	(3.97)***	(2.34)**	(0.79)	(2.46)**	(1.13)		
Domestic Private Credit	0.0108	0.2636	1.376	0.0016	0.0576	0.0008	0.00	299
	(0.67)	(3.26)***	(2.21)**	(0.86)	(2.74)***	(1.16)		
	-0.0739	0.2932	1.3267	0.0010	-0.0888	0.0028	0.02	77
Public Bonds	(-3.56)***	(1.70)*	(0.43)	(0.35)	(-1.39)	(1.99)*		
	-0.0206	0.3153	5.1522	0.0018	-0.0679	0.0029	0.09	69
Private Bonds	(-1.35)	(1.50)	(1.27)	(0.48)	(-1.39)	(1.74)*		
Stock Market Capitalization	0.0058	0.2418	1.4442	0.0007	0.0496	0.0006	0.01	220
	(0.87)	(2.40)***	(1.55)	(0.32)	(1.85)*	(0.54)		
	0.0068	0.2304	1.3989	0.0009	0.0508	0.0000	0.01	219
Dompvtcredit+Mktcap	(1.16)	(2.36)***	(1.58)	(0.39)	(1.90)*	(0.53)		
	0.0174	0.2670	1.4140	0.0019	0.0537	0.0010	0.00	284
Depth	(0.78)	(3.25)***	(2.17)**	(1.00)	(2.38)**	(1.23)		
	-0.0059	0.3265	1.5757	0.0035	0.0337	0.0014	0.00	166
Spread	(-1.16)	(2.91)***	(1.64)	(1.44)	(1.31)	(1.43)		
	0.0083	0.2218	1.4249	0.0007	0.0332	0.0006	0.01	210
Stturnover	(2.07)**	(2.16)**	(1.61)	(0.31)	(1.17)	(0.60)		
	0.0035	0.2612	1.2802	0.0008	0.0319	0.0004	0.01	220
Stvaluetraded	(1.35)	(2.61)***	(1.43)	(0.34)	(1.19)	(0.35)		
	-0.0020	0.3913	0.8912	0.0023	0.0554	0.0016	0.01	128
Mktcap/Bankass	(-0.68)	(2.83)***	(0.66)	(0.84)	(1.63)	(1.26)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively.

Table 14: Legal Effect on the Finance-Growth Nexus - German and Scandinavian Civil Origin

	F_{DVT}	Invest	labor	inflation	trade	budget	Prob>F	N
	-0.0092	0.1365	-0.7709	-0.0010	0.0756	-0.0012	0.52	64
Domestic Credit	(-3.49)***	(4.09)***	(2.41)**	(0.70)	(2.56)	(0.46)		
Domestic Private	0.0084	0.1008	-0.5452	-0.0004	0.0802	-0.0012	0.47	65
Credit	(0.75)	(0.52)	(-0.21)	(-0.09)	(1.69)	(-1.26)		
	-0.0622	0.1767	1.3325	-0.0055	0.0277	0.0000	0.05	51
Public Bonds	(-2.66)**	(0.72)	(0.51)	(-0.88)	(0.55)	(-0.00)		
	-0.0146	0.6276	0.9524	-0.0008	-0.0415	-0.0002	0.15	41
Private Bonds	(-1.30)	(2.81)***	(0.36)	(-0.17)	(-1.06)	(-0.20)		
Stock Market	0.0163	0.2776	2.3892	-0.0013	-0.0092	-0.0007	0.14	54
Capitalization	(2.02)**	(2.10)**	(1.33)	(-0.48)	(-0.29)	(-0.79)		
	0.0081	0.2187	2.8491	-0.0009	-0.0017	-0.0007	0.22	54
Dompvtcredit+Mktcap	(1.60)	(1.69)*	(1.59)	(-0.32)	(-0.05)	(-0.80)		
	0.0619	0.1476	-0.8262	0.0009	0.0954	-0.0011	0.40	58
Depth	(0.71)	(0.72)	(-0.29)	(0.20)	(1.89)*	(-1.09)		
	-0.0153	-0.2204	2.2228	-0.0002	0.0101	-0.0017	0.19	42
Spread	(-0.82)	(-1.43)	(1.07)	(-0.06)	(0.16)	(-2.19)**		
	-0.0100	0.1561	3.2941	-0.0019	0.0088	-0.0010	0.28	54
Stturnover	(-1.39)	(1.16)	(1.83)*	(-0.68)	(0.27)	(-1.05)		
	0.0056	0.3265	2.2865	0.0002	-0.0259	0.0004	0.32	56
Stvaluetraded	(1.47)	(2.21)**	(1.15)	(0.05)	(-0.72)	(0.36)		
	0.0011	0.1233	0.8707	-0.0042	0.0359	0.0020	0.80	24
Mktcap/Bankass	(0.33)	(0.60)	(0.37)	(-0.93)	(0.63)	(0.67)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

To control for the level of economic development, we run separate regressions for countries in different income levels and regions. Our results confirm the findings by Levine, 1997; Rousseau and Watchel, 1998; that importance of the financial development to economic growth varies with level of economic development. Our results show that there is a very weak relationship between financial development and countries in low income regions (see Tables 15 and 16). This relationship is stronger and more significant in the middle income and high income regions. With the exception of the *High Income*, *Middle Income Sub–Saharan African* and *Low Income South Asian* economies, the market structure variable has an expected negative sign signifying that the dominant role of banks in promoting economic growth in most economies.

In *High* and *Middle Income* countries, stock markets play a more significant role in fostering economic growth. We also find that the liquidity of the stock market increases with the level of income development and thus more stock market activity is observed in such countries of economic development. The statistic for the combined markets is also positive and significant though at a lower level of significance than the *Stock Market*. In the *Middle Income* region, our results show that both markets are important in driving economic growth. We found that the increased market activity and the liquidity play important roles in bringing about economic growth to middle income regions. *Middle Income Sub-Sahara African* countries show relatively strong support for the market structure measure as being important in triggering economic growth. The credit market is more dominant in the fruition of economic growth in that region (see Table 21). Openness is also essential in the *Middle Income Sub-Saharan African* region in bringing about economic growth. Results for *Middle Income Latin America and Caribbean* countries show that financial development together with investment, labour and openness are responsible for their economic growth (see Table 19).

Table 15: Level of Economic Development Effects on Economic Growth Low Income, South Asia

	F_{DVT}	Invest	labor	inflation	trade	budget	Prob>F	N
Domcredit	-0.0079 (-0.30)	0.1616 (2.08)**	0.8576 (1.05)	0.001 (0.30)	-0.0206 (-0.68)	0.0005 (0.72)	0.45	58
Dompcredit	-0.0028 (-0.56)	0.1657 (2.09)**	1.0193 (1.18)	0.0011 (0.32)	-0.0247 (-0.75)	0.0005 (0.84)	0.45	57
Pubond	0.1347 (-2.05)**	0.5195 (1.36)	-4.0877 (-0.78)	-0.0017 (-0.29)	-0.0089 (-0.13)	-0.0001 (-0.14)	0.59	27
Stock Market Capitalization	0.014 (1.02)	0.1155 (0.44)	3.951 (1.33)	0.0006 (0.15)	-0.0324 (-0.56)	0.0002 (0.24)	0.53	44
Dompvtcredit+Mktcap	0.0085 (0.67)	0.1370 (0.50)	4.0876 (1.27)	0.0010 (0.27)	-0.0472 (-0.79)	0.0001 (0.13)	0.76	40
Depth	-0.0408 (-1.47)	0.1571 (2.12)	1.0766 (1.40)	-0.0011 (-0.34)	-0.0015 (-0.05)	0.0003 (-0.57)	0.18	57
Spread	0.0089 (1.35)	0.1208 (0.34)	-0.7978 (-0.16)	0.0005 (0.12)	0.0059 (0.08)	0.0003 (0.30)	0.89	30
Stturnover	0.0006 (0.14)	0.0425 (0.14)	5.2266 (1.67)	-0.0001 (-0.03)	-0.0246 (-0.41)	0.0000 (0.03)	0.75	41
Stvaluetraded	0.0014 (0.54)	0.0513 (0.17)	4.9531 (1.70)*	-0.0002 (-0.06)	-0.0374 (-0.69)	0.0000 (0.02)	0.73	43
Mktcap/Bankass	0.0280 (3.49)**	-1.0391 (-3.43)**	-10.4391 (-2.14)*	0.0288 (3.67)**	0.3384 (3.21)**	-0.0471 (-3.06)**	0.10	14

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 16: Level of Economic Development Effects on Economic Growth – Low Income, Sub-Saharan Africa

	F_{DVT}	Invest	labor	inflation	trade	Budget	Prob>F	N
Domcredit	-0.0212 (-1.56)	-0.0835 (-0.82)	0.3601 (0.62)	-0.0024 (-0.64)	0.0308 (1.18)	-0.0005 (-0.57)	0.45	110
Dompcredit	0.0033 (0.20)	-0.1023 (-1.01)	0.5105 (0.87)	-0.0015 (-0.40)	0.0280 (1.06)	-0.0005 (-0.67)	0.76	111
stock market capitalization	0.0086 (0.89)	-0.3202 (-1.77)*	-0.7968 (-0.57)	0.0030 (0.75)	0.0424 (1.13)	-0.0010 (-1.11)	0.36	57
DomPvtCredit+ MktCap	0.0060 (0.61)	-0.3284 (-1.81)*	-0.7504 (-0.54)	0.0031 (0.78)	0.0436 (1.15)	-0.0011 (-1.13)	0.41	57
Depth	0.0379 (1.56)	-0.1225 (-1.16)	0.5735 (1.00)	-0.0012 (-0.32)	0.0286 (1.04)	-0.0004 (-0.50)	0.49	104
spread	-0.0028 (-0.58)	-0.0906 (-1.08)	0.9685 (1.76)	-0.0013 (-0.39)	0.0268 (1.16)	-0.0005 (-0.69)	0.38	107
Stturnover	-0.0009 (-0.19)	-0.4364 (-2.20)**	-1.5911 (-1.02)	0.0026 (0.64)	0.0474 (1.24)	-0.0010 (-1.11)	0.32	56
Stvaluetraded	0.0016 (0.45)	-0.4047 (-2.06)**	-1.4192 (-0.91)	0.0029 (0.74)	0.0444 (1.14)	-0.0010 (-1.10)	0.30	56
MktCap/Bankass	-0.0010 (-0.16)	-0.1782 (-0.61)	-4.3139 (-2.02)*	0.0089 (0.78)	0.1273 (2.57)**	-0.0040 (-1.31)	0.222	26

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 17: Level of Economic Development Effects on Economic Growth - Middle Income, East Asia and Pacific, East Asia & Pacific

	F_{DVT}	Invest	labor	inflation	trade	budget	Prob>F	N
Domcredit	-0.0160	0.2012	6.4276	0.0034	-0.0441	-0.0008	0.05	58
	(-0.49)	(1.42)	(1.59)	(0.98)	(-0.90)	(-0.29)		
Dompcredit	0.0259	0.1749	5.1468	0.0035	-0.0307	-0.0006	0.05	58
	(0.63)	(1.25)	(1.21)	(1.01)	(-0.58)	(-0.20)		
Public Bonds	0.0295	0.4078	-6.9710	0.0025	0.0038	-0.0031	0.12	41
	(1.16)	(2.76)***	(-1.38)	(0.85)	(0.06)	(-1.12)		
Private Bonds	-0.0410	0.1880	6.7448	0.0052	-0.0724	0.0005	0.27	38
	(-1.29)	(0.82)	(0.59)	(0.97)	(-1.13)	(0.12)		
Stock Market Capitalization	0.0330	0.2460	0.4393	0.0026	-0.0249	-0.0017	0.01	57
	(2.43)**	(1.83)*	(0.10)	(0.77)	(-0.52)	(-0.59)		
Dompvtcredit+ Mktcap	0.0288	0.2240	0.1117	0.0027	-0.0130	-0.0013	0.01	57
	(2.36)**	(1.67)	(0.02)	(0.80)	(-0.27)	(-0.45)		
Depth	-0.0088	0.1854	6.1474	0.0033	-0.0425	-0.0009	0.06	58
	(-0.11)	(1.31)	(1.53)	(0.78)	(-0.85)	(-0.31)		
Spread	0.0016	0.2909	1.5558	0.0043	-0.0451	-0.0014	0.48	39
	(0.13)	(1.38)	(0.25)	(1.01)	(-0.80)	(-0.41)		
Stturnover	0.0040	0.1903	5.8226	0.0034	-0.0412	-0.0011	0.07	57
	(0.32)	(1.34)	(1.40)	(0.97)	(-0.82)	(-0.38)		
Stvaluetraded	0.0076	0.1987	4.4301	0.0031	-0.0351	-0.0014	0.04	57
	(1.33)	(1.43)	(1.06)	(0.91)	(-0.71)	(-0.48)		
Mktcap/Bankass	-0.0063	0.0390	5.9389	0.0047	-0.0365	-0.0043	0.00	29
	(-1.46)	(0.52)	(2.80)**	(3.24)***	(-1.39)	(-2.38)**		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 18: Level of Economic Development Effects on Economic Growth Middle Income, Europe & Central Asia

	F_{DVT}	Invest	labor	inflation	trade	Budget	Prob>F	N
Domcredit	-0.1350 (-2.10)**	0.6845 (2.71)*	1.5631 (0.41)	-0.0067 (-0.63)	0.0517 (0.76)	0.0009 (0.47)	0.05	43
Dompcredit	0.1617 (2.54)**	0.0953 (0.30)	-1.3802 (-0.36)	0.0028 (0.26)	0.1243 (2.04)**	0.0008 (0.46)	0.03	43
Public bonds	-0.0870 (-3.37)***	0.1590 (-0.61)	2.1400 (0.56)	-0.0061 (-0.58)	0.0608 (0.91)	0.0002 (0.08)	0.01	39
private bonds	-0.0141 (-1.09)	0.6686 (2.13)**	-1.6406 (-0.31)	-0.0033 (-0.40)	-0.0322 (-0.66)	0.0001 (0.08)	0.26	26
stock market	-0.0096 (-0.61)	0.4792 (2.09)**	5.1731 (1.29)	-0.0005 (-0.05)	0.0445 (0.70)	0.0000 (0.01)	0.46	38
DomPvtCredit+ MktCap	-0.0053 (-0.35)	0.4798 (1.96)*	4.8099 (1.16)	-0.0007 (-0.07)	0.0415 (0.65)	-0.0001 (-0.03)	0.49	38
Depth	0.1790 (1.73)*	0.5911 (2.32)**	0.4753 (0.12)	0.0004 (0.04)	0.1071 (1.69)*	0.0021 (1.03)	0.09	43
Spread	-0.0374 (-1.15)	0.2826 (0.96)	5.2038 (1.18)	0.0012 (0.06)	0.1534 (1.08)	-0.0007 (-0.23)	0.45	27
Stturnover	0.0092 (0.62)	0.4870 (2.10)**	3.4727 (0.91)	0.0007 (0.07)	0.0286 (0.44)	0.0002 (0.09)	0.46	38
Stvaluetraded	0.0030 (0.46)	0.5018 (2.21)**	2.4496 (0.64)	0.0050 (0.50)	0.0048 (0.08)	0.0013 (0.75)	0.39	39
MktCap/Bankass	-0.0030 (-0.61)	0.6359 (1.02)	7.247 (1.35)	0.0103 (0.78)	0.0636 (0.68)	0.0010 (0.68)	0.36	20

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 19: Level of Economic Development Effects on Economic Growth – Middle income, Latin America & Caribbean

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	Prob>F	N
Domcredit	-0.0525	0.3724	3.7359	-0.0033	0.0799	0.0005	0.00	149
	(-3.51)***	(3.32)***	(2.65)***	(-1.10)	(2.39)**	(0.57)		
Dompcredit	0.0017	0.3468	3.0149	-0.0034	0.0992	0.0007	0.00	150
	(0.09)	(2.86)***	(2.08)**	(-1.09)	(2.88)***	(0.73)		
Public Bonds	-0.0501	0.4785	3.0049	-0.0062	-0.0315	0.0023	0.01	50
	(-1.71)*	(-1.94)*	(0.80)	(-1.04)	(-0.25)	(1.35)		
Private Bonds	-0.0099	0.5660	2.0490	-0.0064	0.0392	0.0025	0.04	49
	(-0.57)	(2.27)**	(0.51)	(-1.01)	(0.32)	(1.35)		
Stock Market Capitalization	0.0023	0.4369	3.5239	-0.0038	0.1304	0.0012	0.00	115
	(0.25)	(3.19)***	(1.40)	(-0.99)	(3.28)***	(0.94)		
Dompvtcredit+ Mktcap	0.0026	0.4326	3.3969	-0.0036	0.1297	0.0012	0.00	114
	(0.32)	(3.17)***	(1.34)	(-0.91)	(3.25)***	(0.93)		
Depth	0.0423	0.3612	3.3112	-0.0034	0.1152	0.0007	0.00	136
	(1.66)*	(2.82)***	(1.88)*	(-1.03)	(2.65)***	(0.66)		
Spread	-0.0045	0.4064	3.0062	-0.0044	0.1011	0.0009	0.00	104
	(-0.59)	(2.52)**	(1.65)	(-0.96)	(2.39)**	(0.57)		
Stturnover	0.0183	0.3846	3.2164	-0.0033	0.1142	0.0012	0.00	105
	(3.45)***	(2.89)***	(1.47)	(-0.94)	(2.54)**	(1.00)		
Stvaluetraded	0.0093	0.4889	2.4954	-0.0034	0.1331	0.0009	0.00	112
	(2.43)**	(3.54)***	(1.07)	(-0.89)	(2.96)***	(0.70)		
Mktcap/Bankass	-0.0011	0.5325	2.7769	-0.0014	0.1090	0.0017	0.00	74
	(-0.27)	(2.92)***	(0.84)	(-0.28)	(2.20)**	(1.10)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 20 Level of Economic Development Effects on Economic Growth – Middle Income, Middle East and North Africa

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	Prob>F	N
Domcredit	-0.0231	0.2548	0.8877	-0.0038	0.0833	-0.0011	0.20	85
	(-0.82)	(1.78)*	(0.9)	(-0.63)	(1.97)*	(-0.43)		
Dompcredit	-0.0947	0.2493	0.6850	-0.0049	0.0712	-0.0013	0.09	85
	(-1.77)*	(1.78)*	(0.7)	(-0.82)	(1.69)*	(-0.52)		
Stock Market Capitalization	0.0030	-0.0212	1.9732	0.0424	0.0424	-0.0017	0.63	55
	(0.17)	(-0.10)	(1.79)*	(0.08)	(0.68)	(-0.71)		
Dompvtcredit+ Mktcap	-0.0033	-0.0228	2.0256	0.0008	0.0357	-0.0015	0.63	55
	(-0.19)	(-0.11)	(1.85)*	(0.12)	(0.56)	(-0.64)		
Depth	-0.2303	0.1506	0.4496	-0.0051	0.0486	-0.0013	0.00	84
	(-3.64)***	(1.13)	(0.48)	(-0.92)	(1.21)	(-0.55)		
Spread	0.0050	0.3008	0.1372	-0.0175	0.0022	0.0018	0.91	14
	(0.39)	(1.03)	(0.06)	(-0.30)	(0.03)	(0.19)		
Stturnover	-0.0056	-0.0753	2.2201	-0.0015	0.0689	-0.0018	0.41	55
	(-0.93)	(-0.36)	(2.03)**	(-0.22)	(1.15)	(-0.75)		
Stvaluetraded	-0.0058	-0.0251	2.1757	0.0011	0.0190	-0.0017	0.34	58
	(-1.48)	(-0.14)	(2.10)**	(0.17)	(0.39)	(-0.73)		
Mktcap/Bankass	-0.0089	-0.4701	1.9998	-0.0096	0.1562	0.0051	0.46	29
	(-1.30)	(-1.29)	(1.10)	(-0.79)	(1.60)	(1.27)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively

Table 21: Level of Economic Development Effects on Economic Growth – Middle Sub-Saharan Africa

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	Prob>F	N
Domcredit	-0.0202	-0.0209	2.0435	0.0041	0.2343	-0.0011	0.00	65
	(-1.05)	(-0.27)	(2.52)*	(1.64)	(4.23)***	(-1.53)		
Dompcredit	0.0011	-0.0046	1.5854	0.0040	0.2463	-0.0012	0.00	66
	(0.17)	(-0.06)	(2.29)**	(1.59)	(4.53)***	(-1.64)		
Stock Market Capitalization	0.0233	-0.0603	-0.5172	-0.0014	0.2091	0.0009	0.06	26
	(1.62)	(-0.35)	(-0.75)	(-0.33)	(2.51)**	(0.64)		
Dompvtcredit+ Mktcap	0.0049	0.0107	-0.4542	0.0004	0.2298	0.0008	0.14	26
	(0.53)	(0.06)	(-0.62)	(0.1)	(2.61)**	(0.54)		
Depth	-0.0651	-0.0366	2.1103	0.0040	0.2435	-0.0011	0.00	66
	(-1.00)	(-0.45)	(2.45)**	(1.64)	(4.52)***	(-1.51)		
Spread	-0.0174	0.0580	1.4729	0.0020	0.3141	-0.0013	0.01	35
	(-0.67)	(0.48)	(1.67)	(0.62)	(3.78)***	(-1.35)		
Stturnover	-0.0001	0.0217	-0.4466	0.0009	0.2282	0.0008	0.15	26
	(-0.01)	(0.12)	(-0.59)	(0.21)	(2.58)**	(0.51)		
Stvaluetraded	0.0041	-0.0112	-0.3972	0.0015	0.2394	-0.0005	0.03	29
	(0.60)	(-0.09)	(-0.61)	(0.42)	(3.17)***	(-0.87)		
Mktcap/Bankass	0.0024	-0.0788	3.2367	-0.0009	0.2321	-0.0002	0.17	13
	(0.64)	(-0.48)	(1.96)	(-0.10)	(2.50)*	(-0.16)		

t-statistics are in parenthesis.
*, **,* show levels of significance at 1%, 5% and 10% respective

Table 22: Level of Economic Development Effects on Economic Growth – High Income Countries

	F_{DVT}	Invest	Labor	Inflation	Trade	Budget	Prob>F	N
Domcredit	-0.0125	0.0166	-0.1309	0.0003	0.0722	-0.0019	0.03	87
	(-1.05)	(0.13)	(-0.15)	(0.12)	(1.50)	(-3.15)***		
Dompcredit	-0.0006	-0.0091	-0.0819	0.0004	0.0742	-0.0019	0.04	88
	(-0.09)	(-0.07)	(-0.09)	(0.19)	(1.53)	(-3.15)***		
Public Bonds	-0.0292	0.2631	0.2638	-0.0022	0.0631	-0.0017	0.19	67
	(-0.90)	(1.10)	(0.28)	(-0.91)	(1.30)	(-1.75)*		
Private Bonds	0.0429	0.2768	0.6032	-0.0024	0.0549	-0.0018	0.13	67
	(1.38)	(1.26)	(0.65)	(-0.98)	(1.13)	(-1.92)*		
Stock Market Capitalization	0.0525	0.4386	-0.0074	-0.0005	0.0736	-0.0013	0.00	74
	(3.61)***	(2.48)**	(-0.01)	(-0.26)	(1.70)*	(-1.50)		
Dompvtcredit+ Mktcap	0.0067	0.0691	-0.2281	0.0000	0.0846	-0.0020	0.15	74
	(1.14)	(0.45)	(-0.24)	(0.02)	(1.79)*	(-2.13)**		
Depth	0.0129	0.0518	-0.1287	0.0017	0.1169	-0.0020	0.02	81
	(0.22)	(0.40)	(-0.14)	(0.75)	(2.23)**	(-3.18)***		
Spread	0.0237	-0.0320	-2.7443	-0.0006	-0.0284	-0.0018	0.01	66
	(1.32)	(-0.23)	(-2.12)**	(-0.28)	(-0.50)	(-2.91)***		
Stturnover	-0.0155	0.0069	-0.4052	-0.0007	0.0791	-0.0021	0.09	74
	(-1.69)*	(0.05)	(-0.04)	(-0.33)	(1.69)*	(-2.33)**		
Stvaluetraded	0.0064	0.1085	-0.0801	0.0003	0.0905	-0.0019	0.18	79
	(0.83)	(0.73)	(-0.09)	(0.14)	(1.96)*	(-2.03)**		
Mktcap/Bankass	0.0001	0.1841	-4.7612	-0.0032	0.0345	-0.0006	0.32	32
	(0.02)	(0.50)	(-1.92)*	(-0.77)	(0.36)	(-0.36)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively.

We then modified our model specification to include the financial crisis dummy. Table 23 summarizes the regression results. Financial crisis in all models has a highly significant

but negative relationship with economic growth. This finding is in line with Fischer's (1997) finding that the effectiveness of financial intermediation is reduced during a financial crisis leading to less output. All the financial crisis coefficients are significant at 1% level of significance.

Table 23: Financial Crisis Effect on Economic Growth

	Crisis	**F_{DVT}**	**Invest**	**Labor**	**Inflation**	**Trade**	**Budget**	**Prob>F**	**N**
Domestic Credit	-0.0276	-0.0246	0.1298	0.7716	-0.0005	0.0508	-0.0001	0.00	672
	(-7.35)***	(-3.85)***	(3.42)***	(2.28)**	(-0.39)	(3.94)***	(-0.22)		
Domestic Private Credit	-0.0272	0.0020	0.1117	0.7022	-0.0002	0.0548	-0.0002	0.00	675
	(-7.16)***	(0.44)	(2.93)***	(2.07)**	(-0.13)	(4.14)***	(-0.46)		
Public Bonds	-0.0261	-0.0308	0.1427	0.4335	-0.0017	0.0158	0.0009	0.00	228
	(-4.24)***	(-2.69)***	(1.98)**	(0.38)	(-0.91)	(-0.55)	(1.38)		
Private Bonds	-0.0405	-0.0224	0.2099	1.3835	-0.0019	-0.0279	0.0010	0.00	196
	(-6.28)***	(-2.87)***	(2.88)***	(1.09)	(-0.91)	(-1.07)	(1.19)		
Stock Market Capitalization	-0.0295	0.0116	0.1432	0.7901	-0.0002	0.0408	-0.0002	0.00	483
	(-7.02)***	(2.87)***	(2.79)***	(1.59)	(-0.17)	(2.59)**	(-0.42)		
Dompvtcredit+ Mktcap	-0.0292	0.0083	0.1329	0.8584	-0.0000	0.0422	-0.0002	0.00	478
	(-6.89)***	(2.37)**	(2.56)**	(1.73)*	(-0.01)	(2.66)***	(-0.46)		
Depth	-0.0304	0.0060	0.1098	0.7819	-0.0000	0.0532	-0.0002	0.00	646
	(-7.61)***	(0.45)	(2.84)***	(2.28)**	(-0.03)	(3.85)***	(-0.54)		
Spread	-0.0283	-0.0003	0.0807	0.6657	-0.0001	0.0481	-0.0003	0.00	422
	(-6.42)***	(-0.10)	(1.59)	(1.52)	(-0.10)	(3.13)***	(-0.78)		
Stturnover	-0.0291	0.0040	0.1412	0.9893	-0.0003	0.0295	-0.0003	0.00	469
	(-6.73)***	(1.86)*	(2.69)***	(2.01)**	(-0.19)	(1.79)*	(-0.52)		
Stvaluetraded	-0.0285	0.0034	0.1535	0.7486	-0.0002	0.0274	-0.0005	0.00	490
	(-6.94)***	(2.35)**	(2.98)***	(1.56)	(-0.18)	(1.73)*	(-1.12)		
Mktcap/Bankass	-0.0300	0.0006	0.2007	0.5383	0.0016	0.0642	0.0010	0.00	247
	(-5.03)***	(0.34)	(2.84)***	(0.67)	(0.90)	(3.08)***	(1.15)		

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively.

We then interacted financial crisis with financial development measures to try and ascertain which financial development measures exacerbate or mitigate the effects of a financial crisis. We summarized the results in Tables 24 and 25. From Table 24, it is quite apparent that a financial crisis has a negative effect on the financial development variables' ability to bring about economic growth.

Table 24: Financial Crisis Interaction with Financial Types

	F_{DVT}	invest	Labor	inflation	trade	budget	crisis	crisis* F_{DVT}
Domestic Credit	-0.0187	0.1322	0.7292	-0.0005	0.0515	-0.0002	-0.0271	-0.0390
	(-2.70)***	(3.50)***	(2.15)**	(-0.44)	(3.96)***	(-0.42)	(-7.22)***	(-2.16)**
Domestic Private Credit	-0.0004	0.1064	0.7329	-0.0001	0.0580	-0.0001	-0.0266	0.0383
	(-0.10)	(2.80)***	(2.16)**	(-0.11)	(4.36)***	(-0.29)	(-7.02)***	(2.13)**
Public Bonds	-0.0183	0.1436	0.4431	-0.0016	0.0171	0.0009	-0.0246	-0.0201
	(-1.07)	(1.99)**	(0.39)	(-0.86)	(0.59)	(1.42)	(-3.88)***	(-0.98)
Private Bonds	0.0013	0.2120	1.2751	-0.0027	-0.0274	0.0006	-0.0307	-0.0570
	(0.13)	(3.02)***	(1.04)	(-1.38)	(-1.10)	(0.73)	(-4.53)***	(-3.63)***
Stock Market Capitalization	0.0155	0.1509	0.7847	-0.0002	0.0427	-0.0002	-0.0274	-0.0158
	(3.30)***	(2.92)***	(1.58)	(-0.12)	(2.70)***	(-0.39)	(-6.24)***	(-1.62)
Dompvtcredit+Mktcap	0.0094	0.1359	0.8588	0.0000	0.0424	-0.0002	-0.0286	-0.0053
	(2.36)**	(2.60)**	(1.73)*	(0.01)	(2.66)***	(-0.46)	(-6.54)***	(-0.58)
Mktcap/Bankass	0.0015	0.2044	0.5296	0.0015	0.0647	0.0010	-0.0402	-0.0065
	(0.80)	(2.89)***	(0.66)	(0.88)	(3.11)***	(1.17)	(-4.11)***	(-1.32)

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively.
All models are significant at 1%.

Results of tests to determine the actual effect a financial crisis has on economic growth are presented in Table 25. Column **$\alpha+\beta 1$** shows the effect of a financial crisis on the intercept of our growth equation. All the results in this column are highlighted because they all show that financial crisis had a downward effect on the intercept term. The change in the slope of our growth equation shows which variable exacerbates or mitigates the effects of a financial crisis. These statistics are reported in column **β_{2+} β_3.** Our results show that *Domestic Credit* and *Private Bonds* exacerbated the effects a banking crisis, confirming that government credit allocation is not necessarily to the most efficient projects. However, *Domestic Private Credit* ratio indicates that it mitigated the effects of a banking crisis, substantiating the ability of the credit market to allocate credit to the most efficient projects without the government involved.

Table 25: Effects of Financial Crisis

	Intercept α	**Intercept**^{N} $\alpha+\beta 1$	F_{DVT} β_2	F_{DVT}^{N} $\beta_{2+}\ \beta_3$
Domestic Credit	0.0012	**-0.0259**	-0.0187	**-0.0577**
	(0.12)		(-2.70)***	
Domestic Private Credit	0.0061	**-0.0206**	-0.0004	**0.0379**
	(0.65)		(-0.10)	
Public Bonds	0.0068	**-0.0178**	-0.0183	**-0.0384**
	(0.36)		(-1.07)	
Private Bonds	-0.0164	**-0.0472**	0.0013	-0.0557
	(0.86)		(0.13)	
Stock Market	-0.0036	**-0.0310**	0.0155	-0.0003
	(-0.28)		(3.30)***	

t-statistics are in parenthesis.
***, **,* show levels of significance at 1%, 5% and 10% respectively.

Notes:

β_1 represents the investment channel.

$\alpha+\beta_1$ is highlighted because the result signifies downward shift in the intercept as a result of financial crisis.

$\beta_{2+}\ \beta_3$ signify a change in the slope as a result of financial crisis. The highlighted statistics in that column show a positive / negative and significant change in the slope of the growth equation.

^{N} represents new intercepts and slopes, respectively, as a result of the financial market type's propagation of or cushioning against financial crisis on economic growth.

5 Conclusion

Our results show that financial development enhances economic growth, more so, in the middle income countries. The stock market for instance plays a significant role in the high income and middle income economies in fostering economic growth. We also find that increased domestic private credit and activity reduces the effects of a financial shock on growth. In addition, openness of the economy in low income Sub-Saharan African countries is important for growth even where financial development indicators appear not to influence growth. In most economies the investment channel and openness are consistent in explaining economic growth. Overall, we find that financial development enhances economic growth in middle and high income countries more significantly.

Appendices

Data Appendix 1

Table 26: Variables for Finance Growth Nexus Model

Variable Name	Description and or Interpretation	Source
Real GDP Growth [rgdp]	Rate of growth real GDP.	*World Development Indictors*
Domestic Credit	Rate of growth of domestic credit to GDP [Government and public enterprises included]	*World Development Indictors*
Domestic Private Credit	Rate of growth of the ratio of domestic credit to private sector to GDP	*World Development Indictors*
Public Bond	Public domestic debt securities issued by government as a share of GDP	*World Development Indictors*
Private Bond	Private domestic debt securities issued by financial institutions and corporations as a share of GDP	*World Development Indictors*
Stock Market capitalization	Rate of growth of the ratio of stock market capitalization to GDP	*World Development Indicators*
Domestic Private Credit +Stock Market Capitalization	Sum of domestic private credit and stock market growth rates.	
Liquid Liabilities of Banks [depth]	Rate of growth of the ratio of liquid liabilities [M3] to GDP.	*World Development Indicators*
Mktcap/DomPvtCredit	Ln[Stock Market capitalization / Domestic Private Credit].	*World Development Indictors*
Lending and Deposit Spread [spread]	The difference between the Lending Rate and Deposit Rate.	*World Development Indicators*
Labor Force [labor]	Rate of change of the population.	*World Development Indicators*
Share of Gross investment to GDP [invest]	Rate of growth of Gross Fixed Capital Formation divided by GDP.	*World Development Indicators*
Budget Deficit or Surplus [budget]	Rate of growth government budget surplus [deficit].	*IFS Database*
Openness to International Trade [trade]	Rate of change of the sum of exports and imports of goods and services.	*World Development Indicators*
Inflation [inflation]	Rate of change of the CPI index.	*World Development Indicators*
Legal Origin Dummy [legal]	Legal origin identifies the origin of the Company Law or Commercial Code in each country [1-English, 2–French, 3-Germany and Scandinavia].	La Porta et al [1997]

Data Appendix 2

Table 27: Variables for Macro-Determinants of Financial (Banking) Crisis Model

Variable Name	Description and or Interpretation	Source
Crisis Dummy (Crisis)	Dummy variable takes the value of 1 during episodes of systemic banking crisis, 0 otherwise.	Demirgüc-Kunt and Detragiache [1997], Caprio and Klingebiel [1996, 2003]
Real GDP Growth (Grwthrgdp)	Rate of growth real GDP.	*World Development Indictors*
Domestic Credit Growth (Gdomcredit)	Rate of growth of domestic credit to GDP [Government and public enterprises included]	*World Development Indictors*
Domestic Private Credit Growth (Gdompcredit)	Rate of growth of domestic credit to private sector to GDP	*World Development Indictors*
ΔExchangerate	Rate of change of US dollar to domestic currency [US dollar Exchange rate]	*World Development Indictors*
Current Account (Current)	Sum of net exports of goods, services, net income, and net current transfers to GDP	*World Development Indicators*
Real Interest (Realint)	Lending interest rate adjusted for inflation as measured by the GDP deflator.	*World Development Indicators*
Terms Of Trade (Totrade)	Rate of change of the sum of exports and imports of goods and services.	*World Development Indicators*
Inflation	Rate of change of the CPI index.	*World Development Indicators*
Gdpcap	Per capita income	*World Development Indicators*
Reserves_Debt	Ratio of international reserves to external debt	*World Development Indicators*
Bank Openness (Bankopen)	Index measuring openness of the banking sector to foreign players.	*Bureau Van Dijk*
Financial Regulation (Finreg)	Index measuring the degree of financial sector regulation.	*Bureau Van Dijk*
Institutional Effectiveness (Institutional)	Index measuring the business environment rankings quantify the attractiveness of the business environment	*Bureau Van Dijk*
Legal	Index measuring the transparency and fairness of legal system.	*Bureau Van Dijk*

Table 28: Crisis Dates and Legal Origin

Country	Crisis Start Dates[8]	Legal Origin[9]
Algeria	1990	French
Argentina	1989,1995,2001	French
Australia	1989	English
Bangladesh	1987	English
Bhutan	-	English
Bolivia	1986,1994	French
Botswana	1994	English
Brazil	1990, 1994	French
Burundi	1994	French
Cameroon	1987	French
Canada	-	English
Chile	1990, 1994	French
Colombia	1999	French
Cote d'Ivoire	1988	French
Czech Republic	1993	Germany
Denmark	1987	Scandinavian
Ecuador	1996	French
Egypt	1991	French
Germany	-	Germany
Ghana	1997	English
Hong Kong, China	1998	English
Hungary	1991	Germany
India	1993	English
Indonesia	1994, 1997	French
Iran, Islamic Rep.	-	English
Jamaica	1994	English
Japan	1996	Germany
Jordan	1989	French
Kenya	1992, 1993, 1996	English
Korea, Rep.	1997	Germany
Lesotho	1998	English
Libya	-	French
Macao, China	-	French
Malawi	-	English
Malaysia	1997	English
Mauritius	-	English
Mexico	1981, 1995, 1997	French
Morocco	-	French
Nepal	1988	English

[8] See Demirgüc-Kunt and Detragiache (1997) and Caprio and Klingebiel (1996, 2003)

[9] See La Porta et al (1997)

Netherlands	-	French
Nigeria	1993, 1997	English
Pakistan	-	English
Paraguay	1995, 1997	French
Peru	1986	French
Philippines	1998	French
Poland	1991	Germany
Senegal	1988	French
Seychelles	-	English
Singapore	-	English
Spain		French
Sri Lanka	1990	English
St Vincent and Grenadines	-	English
South Africa	1989	English
Syrian Arab Republic	-	French
Tanzania	1987, 1995	English
Thailand	1997	English
Trinidad and Tobago	-	English
Turkey	2000	French
Tunisia	1991	French
Uganda	1994	English
United Kingdom	1991, 1995	English
United States	-	English
Uruguay	2000	French
Venezuela, RB	1986, 1994, 2002	French
Zambia	1995	English
Zimbabwe	1995, 1998, 2003	English

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