# FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: Can we infer unidirectional causality?

By

Kenneth E. Kalu
(3172845)

Major Paper presented to the

Department of Economics, University of Ottawa

in partial fulfillment of the requirements of the M.A Degree

Supervisor: Professor Mario Seccareccia

ECO 7997

Ottawa, Ontario
April 2004

## Abstract

This study uses a Granger causality tests to examine the relationship between financial development and economic growth. Tests results could not produce conclusive evidence that one variable generally leads the other. Therefore, this study corroborates the view that financial development shapes, and is shaped by economic growth; none could be said to lead the other in the Granger causality sense. Again, results presented in this paper further underscores the need to interpret the growing number of studies on this subject on the basis of the assumptions, the variables, and the methodologies used in a given study. Results presented in this paper has important policy implications: working on the false assumption that financial development leads economic growth, both national governments and multilateral institutions such as the World Bank and the International Monetary Fund (IMF) may invest much effort and resources on developing the financial sector of a given country, with the expectation that a developed financial sector would invariably bring about economic growth. The weak evidence of causality presented in this paper implicitly calls for simultaneous emphasis on both the financial sector and other sectors in the quest for economic growth and development.

**FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: Can we infer unidirectional Causality?**

## Introduction

There is unanimity of opinions that finance plays important roles in economic activities. However, what is yet to be established is whether financial development drives economic growth or vice versa. Another issue in the literature is the lack of a coherent definition of financial development. Financial development encompasses several factors. According to Creane, Goyal, Mobarak and Sab (2003), financial development is a "multifaceted concept" (p. 3), which encompasses among others, factors ranging from monetary aggregates, accessibility of financial services, institutional capacity, to the strengths and weaknesses of regulatory authorities. With this broad definition, it is difficult, if not impossible to address all aspects of financial development in a single study such as the present exercise. Therefore, for the purpose of this study, financial development is viewed in terms of the capacity of the banking sector to provide the requisite credit to the private sector of an economy. Justification for the choice of this measure rests on the assumption that developed financial systems are more able to meet the financing needs of the economy, thereby ensuring that no profitable project is forgone due to lack of funds. This measure of financial development has been used extensively in previous studies, (for example, Levine (1993), Levine and Zervos (1998) and others).

One of the traditional roles of the financial system in an economy is financial intermediation. Through financial intermediation, the financial system is able to provide valuable financing functions to both the private and public sectors of an economy. Financial intermediation encompasses the financial sector's roles in mobilizing funds from the savings-surplus units, and lending those funds to the savings-deficit units. In a

more comprehensive description, financial intermediation involves amongst other things, transformation of liabilities into assets, creation and sale of financial assets through various means, exchange of financial assets on behalf of customers, and financial portfolio management in general. Given that firms can hardly operate without adequate provision of financial services, the financial sector is critical to the success and growth of businesses.

It is pertinent to recognize alternative views to the neoclassical financial intermediation role highlighted above. While the traditional view may imply that causality runs from household savings to investment, the Post Keynesian view is that investment brings about savings. Thus, adherents of the Post Keynesian view or the circuit theory argue that loans indeed create deposits. Further exposition of this view is given in Lavoie (1996), Seccareccia (1996) and others. It is important to point out that the direction of causal linkages between loans and deposits in the economy is not likely to affect the result of this study. Whatever direction the causal linkages may take, one factor is certain: financial institutions have important roles to play in ensuring smooth and profitable conduct of businesses.

There is a growing literature on the relationship between financial development and economic growth. However, what is lacking is a unanimity of opinions as to which factor leads the other. While some studies have shown both theoretically and empirically that financial development brings about economic growth, others show that economic growth leads financial development. Yet there is another school of thought, which contends that no evidence exists to suggest causality in either direction. With this divergence of opinions, it becomes difficult to draw valuable conclusions that could

inform public policy decisions. If financial development drives economic growth, then policy makers should channel resources to developing the financial sector; but if causality is in the other direction, then policy initiatives should focus on the non-financial sectors to achieve economic growth.

One consequence of these divergent opinions is the need to conduct a critical evaluation of some of these studies. Such evaluations could only be meaningful when they are guided by economic theory, and the dictates of conventional wisdom. To this end, this paper presents an evaluation of the findings in Shan and Morris (2002). Shan and Morris find "meager evidence that financial development *leads* economic growth, either directly or indirectly" (p. 153). This finding is contrary to the results shown in Levine (1997), which indicates the existence of a strong relationship between financial development and economic growth. There is no gain saying that individual research method and choice of variables would have a direct impact on results, but what appears somewhat stunning is the rationale behind the choice of certain variables over other competing variables. Using the ratio of total credit to the GDP as a measure of financial development, Shan and Morris' rationale is that credit should be more readily available in financially developed countries than in financially underdeveloped ones. This justification can certainly pass common sense scrutiny.

The Shan and Morris (2002) measure fails to consider how credit is allocated within the economy, and how these channels could affect economic growth. If the bulk of the credit in an economy were extended to the government sector, which uses the funds to maintain the political machinery of the state, its effect on the economy would only be negligible. Thus, use of total domestic credit, as a proxy for financial development should

be viewed with caution because total credit may not have any direct relationship with economic growth. The use of total credit to the non-bank private sector is a more credible measure because it points clearly to where those credits have been channeled. Along these lines, King and Levine (1993) note that through allocating credit to the private sector, banks are able to evaluate managers, and thus, ensure that the most profitable investment projects are financed. In pure market economies, credit to the private sector would more directly impact the flow of economic activities than credit granted to the government, usually for political reasons. Shan and Morris apply a Granger (1969) causality framework to establish whether financial sector development (measured by the ratio of total credit to GDP) leads economic growth; or whether economic growth leads financial development. Their results could not provide conclusive evidence as to the direction of causality.

Contrary to Shan and Morris (2002), Levine (1997) uses a simple regression framework to show that financial development is strongly related to economic growth, both in the short run and in the long run, and that financial development is a good predictor of economic growth. It would be useful to note that the methodology adopted by Levine is not sufficient to establish causality, or lack of causality. Simple regression analysis can only indicate the pattern of relationship, it is not meant to indicate the direction of causality. Another difference between the Levine paper and that of Shan and Morris is that Levine uses different proxies for financial development. Among other variables, he uses the ratio of total private sector credit to the GDP, and the ratio of private sector credit to total credit in the economy as proxies for financial development. Therefore, although they are basically interested in the same broad question, their

approaches differ in many significant respects. While the Levine proxy for financial development is an improvement over the proxy used by Shan and Morris, the methodology adopted in the Levine study is not equipped to define causality. Again, the Levine study employs cross-country studies using cross-section data. On the other hand, the Shan and Morris study uses time series analysis of different countries. Cross-country studies are based on the implicit assumption that countries share the same institutional structures, (Arestis and Demetriades, 1997). However, this assumption cannot be considered realistic when one considers the fact that even countries at the same levels of development may have specific industrial and other structural characteristics unique to individual countries. Cross-country studies become especially troublesome when several countries at widely different levels of political and economic development are arbitrarily lumped together in a regression analysis.

Another proxy for financial development used by Shan and Morris (2002) is what they referred to as a "measure of financial efficiency". They use the spread between borrowing and lending rates as an indicator of financial efficiency, and thus as a proxy for financial development. Hard as one may try, it is difficult to explain the intuition behind this measure, given the availability of other proxies. Bank lending rates are driven by the Central Bank rediscount rate, which embodies several economic and sometimes political factors. If the government fixes interest rates at a certain level because it wants to fight inflation, or because it intends to follow a certain economic policy framework, how does such government action translate to a measure of financial sector efficiency? Although one may argue that Shan and Morris used interest rate spreads (not the interest rates itself), experience has shown that banks usually keep their deposit rates fixed for the

most part, while lending rates are continually readjusted with government policy changes. Under this condition, changes in interest rates by the government would affect banks' interest rate spreads. Therefore, it is difficult to make the connection between interest rate spreads and financial sector efficiency.

Economic theory and common sense interpretation of efficiency would focus on how resources are used in achieving given ends. It is in this sense that Demirguc-Kunt, Levine and Min (1998) define efficiency in two ways: first is banks' profit before tax divided by its total assets. This measures how banks are able to generate profit with a given level of asset. With this measure, if Banks *A* and *B* have the same level of assets, the bank with the higher profit derived from the same level of asset is considered more efficient. The second proxy measures banks' total overhead costs divided by total assets. These two measures conform to general ideas of efficiency because they tend to show how results have been achieved with a given level of resources. But Demirguc-Kunt et al. did not use these measures as proxies for financial sector development; rather they were concerned with the impacts of the entry of foreign banks into an economy on the efficiency of the entire banking sector. The Shan and Morris (2002) approach may be more intuitively appealing if efficiency were measured in terms of the size of the financial sector (represented by the number of banks), and the strength of the sector (measured by how much credit it is able to extend to the private sector).

In light of the on-going controversy on the relationship between financial development and economic growth, this paper contributes to the literature by an attempt to reconcile the conflicting results shown in Shan and Morris (2002), and those in Levine (1997). This paper has not merely concentrated on providing a review of these studies; it

has made important extensions in terms of the data used, the literature explored, and the connection to public policy. In general, this paper differs from other studies in several respects. First, it uses two measures of financial development: the ratio of private sector credit to total domestic credit in the system, and the ratio of private sector credit to the GDP. As noted above, these measures were used in Levine (1997), among others. The ratio of private sector credit improves upon the Shan and Morris measure by considering credits that are most likely to have a direct impact on the economy. Second, this study applies Granger causality tests in order to indicate the precise direction of causality. Granger causality test is an improvement on the Levine simple regression approach, because the Granger framework allows us to observe whether movement in one variable causes movement in the other. While simple regression analyses merely show the nature of a relationship, causality tests are more suited to identify directions of causality, if any. Third, this paper uses individual country time series, so as to avoid the unrealistic implicit assumptions of cross-country cross-sectional analyses.

Results presented in this study are more in line with those of Shan and Morris (2002). The causality tests could not produce conclusive evidence that one variable generally leads the other. The results differ across and within countries when different variables are used. Therefore, this study corroborates the view that financial development shapes, and is shaped by economic development; none could be said to lead the other in the Granger causality sense. Again, results presented in this paper further underscores the need to interpret the growing number of studies in this area on the basis of the specific assumptions, the variables, and the methodologies used in a given study. This study has important policy implications: working on the false assumption that financial

development leads economic growth, both national governments and multilateral institutions such as the World Bank and the International Monetary Fund (IMF) may invest much effort and resources on developing the financial sector of a given country, with the expectation that a "developed" financial sector would invariably bring about economic growth. The weak evidence of a specific direction of causality presented in this paper implicitly calls for simultaneous emphasis on both the financial sector and the other sectors as well.

The rest of this paper is organized as follows: Section 2 presents a review of selected literature on finance and economic development. While effort has been made to provide a succinct review of many relevant studies on this subject, it is pertinent to point out that this review is by no means exhaustive. In section 3, a description of the data and methodology is presented. The research results are analyzed in section 4, and a brief conclusion is presented in section 5.

## 2. Literature Review

### 2.1 Financial Development and Economic Growth

The literature on finance and economic development presents divergent views on the importance of the financial sector in economic growth. Studies as early as Bagehot (1873), Schumpeter (1912), Goldsmith (1969), Mckinnon (1973) as well as some recent papers seem to agree with the view that development of the financial sector enhances economic growth. Those highlighting the financial sector's importance in economic growth point to the various routes through which financial intermediation helps to channel resources to the highest value use without the risk of loss due to moral hazards and adverse selection[1]. For example, Schumpeter notes that a good financial sector would enhance economic growth by identifying and funding those entrepreneurs who have the best chances of success. Thus, applying the functional approach, Schumpeter refers to the financial sector's role in providing credit to those in need of funds.

In an extensive study of financial development and economic growth, Levine (1997) notes that an understanding of financial sector development is critical for any appraisal of economic growth. He shows that there is a strong positive relationship between financial development and economic growth. However, while the Levine study is quite extensive, his methodology does not have the capacity to indicate the direction of causality. It may not be enough to state that a relationship exists between financial development and economic growth. The mere fact that financial institutions perform important roles in facilitating production and exchange already indicates that this

[1] These risks arise because economic agents may not have perfect information about the activity, and circumstances of the other party in a given transaction.

relationship exists. The existence of such a relationship does not imply that one variable causes the other.

Greenwood and Jovanovic (1990) note that financial structure and economic growth are interlinked, and that a significant relationship exists between the two. They suggest that financial intermediation enhances economic growth because intermediation ensures that higher rates of returns are earned on capital. Again, Greenwood and Jovanovic were more concerned with modeling the existence of a relationship between financial development and economic growth. Such models as those in Greenwood and Jovanovic are excellent mathematical exercises, but they present little basis for making inference, and for formulating economic policy. If it is established that a relationship exists, there is still the need to know which variable, if any, drives the other.

Robinson (1952) argues that economic growth drives financial sector development; she suggests, "where enterprise leads, finance follows" (p. 86). This implies that economic growth creates the need for financial services, and the financial sector merely responds to this need. However, this view fails to emphasize the cause of the initial economic growth; is it not possible that the financial sector leads economic growth in the first place, and growth in turn creates further demands on the financial sector? Extended logically, this line of thought could result in a situation of infinite regress because we will need to identify what caused the initial growth at every point in the analysis. But those highlighting the concept of endogenous credit insist that loans create deposits (see Lavoie (1985), and Moore (1988) for further exposition), thus it could follow from the endogeneity principle that enterprise leads finance as Robinson argues. The Robinson framework may have more applicability in a developed country

with a highly structured and sophisticated financial system. For example, credit is more readily available in developed countries than in developing countries, and so it could be argued that in such developed economies, banks only respond to increasing demand from the real sector. In a situation where there is relatively easy access to credit, it is possible that all profitable projects are financed, thus, banks are able to meet market demands. Robinson's standpoint could also apply where there is flexibility in the banking system, such that even if a single bank is unable to meet the credit requirement of a client, a consortium of banks would arise to the occasion to provide the requisite credit. Although opinions differ, some recent studies suggest that there is a clear positive relationship between financial sector development and economic growth.

King and Levine (1993) highlight the importance of financial sector development in economic growth. According to them, the extent of financial intermediation correctly predicts economic growth in the long run. Using measures of stock market liquidity and banking development, Levine and Zervos (1998) show that financial sector development positively predicts economic growth, capital accumulation and productivity improvements. According to them, their results are robust even after controlling for other factors that could influence economic growth. Most of these studies, (e.g. King and Levine, 1993; Levine and Zervos 1998; Levine, 1997) use cross-country data, and therefore fail to address the issue of causality in their approaches. A major deficiency in these cross-country studies is that apart from its inability to indicate clear directions of causality, the approach generally lumps countries at widely different levels of social, economic and financial development together. When countries at varying levels of development are joined in the same regression, there is the fear that results from such

studies may not make any concrete meaning, because making generalization from such results does not have strong analytical justification. The implicit assumption of a level of structural uniformity in diverse countries makes results from cross-country regressions a little weak when there is the need to address causal linkages. Rajan and Zingales (1998) also show a positive relationship between financial development and economic growth. According to them, causality runs from financial development to economic growth. This implies that industries with greater need for funds (credit) are more likely to do well in countries with a well-developed financial sector.

Focusing on countries in Sub-Saharan Africa, Spears (1992) shows that financial sector development enhances economic growth. Her study uses different proxies for financial sector development. First, she used the ratio of all financial assets to GDP; this measure shows the strength of the financial sector in creating financial assets. The idea is that developed financial sectors are likely to create more assets than undeveloped financial systems. Second, she uses the ratio of currency, demand deposits and quasi-money to GDP. Finally, the ratio of Quasi-money (time and savings deposits) to M2 was used as another measure. She notes that the quasi-money to GDP approach is a significant indicator of the progress of financial intermediation, "since it is through the growth of time and savings deposits that financial intermediaries can better fulfill their dual role as instrument in the accumulation of savings and as conduit for more efficient capital formation", (Spears, 1992; p. 363). This statement tends to assume that savings and time deposits are the principal ways through which banks raise liabilities that are further transformed into assets. But many banks get a large chunk of their deposit liabilities from demand deposits, and from inter-bank borrowings. A distinctive feature of

the Spears' study is that it focuses only on the developing countries of Sub-Saharan Africa, where very scanty work has been done, as such; her study presents a developing country perspective. Her study shows a positive relationship between financial sector development and economic growth, and that causality runs from finance to economic development. However, she ended with a cautionary note that further tests need to be conducted before a firm conclusion could be reached on the nature and strength of the relationship.

While the debate over which factor drives the other rages, some authors are of the view that there is no strong reason to assume that financial development leads economic growth, or that economic growth drives financial development. For example, Lucas (1988) notes that the literature tends to overstress the role of the financial sector in economic growth. Lucas would rather focus on other factors to explain economic growth. So far, one clear point is that the financial sector plays important roles in the conduct of economic activities. The following section highlights some of the important roles of finance in the economy.

## 2.2 The Roles of Finance

In an important study, Schumpeter (1912) indicates that a good banking system is able to identify and fund those businesses with the highest chances of success. This implies that the financial sector is able to ensure that potentially profitable projects are not lost due to lack of funds. The *Schumpeterian* analysis is a clear representation of the traditional role of the financial system. Over the years, increasing sophistication in business requirements and financial structures meant that the financial sector has gone beyond the traditional roles of providing funds to those entrepreneurs in need of credit.

Banks are continually devising several other state-of-the-art responses to the needs of their clients. Some of the major roles of finance in the economy are outlined below:

(a) **Mobilizing Savings and channeling them to profitable investments**

One of the traditional roles of the financial sector is mobilizing resources from the savings surplus units and lending the resources so mobilized to the savings deficit units. As noted in the introduction, there is the Post Keynesian view that investment precedes savings. This view argues that in an overdraft economy, firms borrow in order to engage in production. Part of the amount borrowed is obviously paid to households as wages, and households consume their income or save them in the bank. As noted previously, this view is well explored in the relevant literature.

Focusing on the neoclassical financial intermediation function, banks make it possible for corporations to access resources from various small-scale depositors, such that it becomes possible for every (or most) profitable project to be undertaken. On the other hand, individuals and households are able to invest their surpluses in profitable ventures without having to undertake close study of those ventures, because they lack the capacity to do this. Without the financial intermediation role, individuals and households, on their own, may not be able to access the investment opportunities provided through financial institutions. Again, as Siri and Tufano (1995) note, profitable production would be subjected to economically inefficient scales without access to multiple investors. This implies that financial institutions are able to help firms access a larger pool of resources than would otherwise be possible if firms were to source their resources directly from households and other savings-surplus units. Along this line, it is argued that enhanced access to credit leads to more production, and economic growth.

Firms would incur exorbitant transaction costs if they were to search for funds directly from individuals and households, but these transaction costs are significantly reduced through financial intermediation. A direct relationship between owners of funds and those in need would also create problems of trust. Such a direct relationship might also lead to possible adverse selection problems, because individuals and households cannot observe the firms using their resources. Any attempt to embark on such monitoring would be so costly, as to erode the potential benefit from the investment. Thus, financial intermediaries provide a sort of comfort to owners of resources. Various deposit insurance and other forms of government schemes, and implicit guarantees are some of the ways that help engender depositors' confidence in the financial system.

Since pooling resources from savers, and lending these resources to firms could lead to better outcomes (higher productivity), it follows that a financial system that is better at carrying out this function would have a higher positive impact on output growth than another financial system that performs this function badly. Through this intermediation function alone, one can logically argue that financial sector development should have a positive impact on economic growth. But the fact, that the financial system provides capital to businesses does not necessarily imply that development in the financial sector leads to economic growth; quite contrary, it could be that financial systems actually respond to the demands of the economy.

(b) **Mitigating Risk**

By pooling resources from different agents and lending these resources to firms in need of funds, the financial sector is able to spread the potential risks of a particular

investment to many economic units. In this way, risks are pooled together, and no single agent bears the entire risk from business failure. Pointing to the risk-mitigating role, Levine (1997) notes that well-functioning financial markets are able to ameliorate liquidity risk by providing a framework through which holders of financial assets are able to convert their assets into a liquid form as soon as they wish, and without undue loss in value. By being able to convert their financial assets into the desired form, investors develop more confidence in the financial system, and are motivated to invest more, which logically leads to more funds being available to those in need.

It is important to note that some growth-enhancing projects may require long-term investment. However, most depositors may not be able to commit to long-term investment. A strong financial system makes it possible for investors to sell their investment as required, while interested depositors have the opportunity to invest as and when needed. According to Hicks (1969), the improvements in financial markets that ameliorate against liquidity risk were the major causes of the industrial revolution in England. A well-functioning financial system would be able to resuscitate profitable production processes when the firm faces liquidity problems. Without this service, many businesses would not be able to survive the various ups and downs associated with the business cycle. In addition, through its ability to transform its assets and liabilities into different forms, banks are able to provide relatively long-term credit, even when individual depositors are only willing to place their money on a short-term basis.

Furthermore, through services such as Bank Guarantees, banks are able to assume away some of the risks involved in business operations. When a bank issues its Guarantee, it is absolving the party to whom the Guarantee is addressed of liabilities that

may arise from the business relationship. This boosts the confidence of both parties in the transaction, and creates an enabling environment for business deals to go on with a relatively higher level of trust. When a Bank issues its Guarantee, it has an incentive to monitor the customer on whom the Guarantee is made. This increased level of monitoring serves as a check on managers not to engage in unprofitable or unduly risky projects. The final result is that total risk in the business relationship from the perspectives of all parties involved drops significantly.

(c) **Monitoring Business Operations**

When banks provide credit to a firm, the bank has the incentive to monitor managers of the firm in order to ensure that the investment is secure. Through various financial arrangements and loan covenants, banks are able to exert some form of control on business operations. Although bank monitoring may inhibit the manager's independence, it is generally meant to ensure that investment in the firm yields profitable results. Individuals and households do not have the resources to monitor manager's actions; in fact, the economics literature has shown that it is largely inefficient for individual investors to monitor firm's operations. Williamson (1987) notes that the various financial contracts that lower monitoring and enforcement costs help to reduce hindrances to efficient investment. Again, as noted in Levine (1997), since firms obtain loans from various financial institutions, the cost of monitoring is significantly reduced as these financial institutions exchange relevant information. The establishment of credit bureaus is a typical example of how information sharing is used by banks to monitor borrowers' credit history. Credit bureaus make it possible for existing and potential lenders, as well as other business associates to have information relating to the credit

worthiness of a potential customer. Thus, we see that banks have an enormous machinery to enable them to provide effective monitoring of both individual and corporate clients; this role is of benefit to all parties. Individuals and other businesses may not have the requisite institutional structures and technical expertise to monitor managers' actions, but banks are well suited for such roles.

Financial contracts signed with banks during loan negotiations may also restrain the firm from investing in highly risky projects. Managers are conscious of the fact that if they make wrong investment decisions and fail to meet their contractual obligations, the firm's credit rating may drop, making it difficult for it to borrow more money in the future. Along the same line, Jensen and Meckling (1976) note that a developed stock market could promote corporate control because when stock prices reflect information about the firm, owners could link managerial compensation to the firm's performance in the stock market. This arrangement forces managers to take only those decisions that would increase the value of the firm. Increased firm value across every industry is the same as economic growth, because the economy is made up of these firms. Therefore, by monitoring managers, and exerting corporate control, the financial sector tends to support actions that could result to growth.

(d) **Ensuring a smooth flow of exchange**

The barter system of exchange posed enormous problems that hindered specialization and growth. Among other constraints, the requirement of a double coincidence of want, and the unavailability of a generally accepted unit of account made the barter system cumbersome, and inefficient. The introduction of money as a unit of value provided an escape from the shortcomings of barter, and thus, enhanced exchange.

Adam Smith had long noted that exchange would lead to economic growth. Financial intermediaries facilitate the smooth flow of exchange by providing services that lead to specialization and production on a large scale. When peasants were involved in pure subsistence farming because they lacked capital, there was little or no exchange because all outputs were consumed within the household. If capital were made available by financial institutions, production would exceed the subsistence level, and thus create the need for exchange. By inference, firms are more able to specialize and produce on a large scale when they have access to financial capital.

In addition to providing capital needed for production, financial institutions also facilitate exchange by providing some other important logistics that aid production and exchange. Letters of credit and Bank Guarantees are some of the services that banks provide to enhance the free flow of goods. International trade would be almost impossible if there were no banks. By their position banks are able to provide firms with the support they need when dealing with international customers. Money transfers to foreign countries would be cumbersome if businessmen were to carry their money physically to meet their international suppliers. Banks are able to facilitate both local and international transactions by offering fund transfer services. Although these services may not involve the granting of credit to clients, they are of no less importance to businesses than credit.

Financial institutions are also important sources of information on trade and investment opportunities elsewhere. Businesses often rely on banks for information on potential customers. Because of their position, banks are able to generate a pool of information on credit status and business capabilities of a large number of businesses. By making valuable information available to their clients, and by acting as reference for their

customers, banks are able to help firms reduce transaction and information costs (Levine, 1997). As the financial sector develops, transaction and information costs would continue to fall, thus making for higher levels of specialization and trade and, by implication, enhancing economic growth.

(e) **Facilitating human capital development**

Human capital development has since been recognized as an important factor in economic development. By facilitating borrowing for the accumulation of skills, banks are able to contribute to human capital development (Cooley and Smith, 1992; and De Gregorio, 1996). Developed financial systems influence human capital development by making it possible for people to acquire the education and training, which they would otherwise, be unable to acquire without bank loans. Various forms of bank loans exist for MBA students, as well as for other programs. By acquiring valuable skills, individuals are better assets to society, and are thus more suited to contribute to economic growth and development.

The above points have provided a modest overview of the roles of finance to businesses. It is pertinent to note also, that businesses play important roles in spurring financial sector development. Businesses generally create an avenue for banks to invest and earn returns in the form of interest receipts. Banks also provide other valuable services to businesses, for which they are paid fees. In a bid to satisfy their customers, banks tend to respond to their clients' need by devising products and services that would meet those needs. The continuous development of several financial products and services results in financial sector development, and sophistication. One can safely state that the

relationship existing between banks and business firms is mutually beneficial to both parties.

## 2.3 Measures of Financial Sector Development

From the literature on finance and economic development, there seem to be no consensus on a single measure of financial sector development. While some authors argue that the total size of the financial sector, measured by its total assets, represents a fair measure of the financial sector development, others argue that such a measure fails to indicate how, and where those assets are allocated. Still, some authors have used proxies ranging from the total savings and time deposits, to the total money stock in the system. In this section, I present a representative catalogue of the proxies used in the literature, the strength and weaknesses of each proxy are also highlighted.

1. *The stock of broad money, divided by GDP.* (Used in Goldsmith, 1969; McKinnon, 1973; Spears, 1992). This measures the ratio of currency, demand deposit and quasi-money to GDP (M2/GDP). Users of this measure note that it is a reflection of the size of the financial sector in an economy. However, King and Levine (1993) argue that the stock of money (M2) does not show whether the liabilities are those of the central bank or of other institutions, and totally ignore how the money is allocated in the economy. Therefore, relying solely on this proxy may produce misleading results.
2. *Total financial assets (M3) divided by GDP* (Spears, 1992; and others). This measure considers the entire assets of the financial sector in relation to GDP. Users of this measure argue that it represents a complete picture of the strength of the financial system measured by its total assets. They argue that banks are not the

only institutions providing credit in the economy. However, this measure fails to indicate the exact composition of these assets, and it fails to show how the assets are allocated within the economy. Again, because of the broad composition of total financial assets, it becomes difficult to identify clearly how these assets impact the economy as a whole, because there is no indication of where they are allocated.

3. *The ratio of Demand Deposit and Time Deposit to M2* (Spears, 1992 and others). Spears argues that the strength of this measure is in the fact that it shows the success/failure of the financial sector in generating demand and time deposits used for investment.[2] This measure is a good test of how the populace has imbibed banking and savings culture. It would be very useful if one was interested in finding the extent to which individuals and households, especially in developing countries have imbibed banking habit. However, the assumption that demand and time deposits are the primary sources of funds for investment may not hold in every situation.
4. *Total assets of commercial banks divided by the GDP*. Commercial banks are directly involved with firms and businesses. Although commercial banks do extend credit to the government and to other financial institutions, the non-bank private sector relies mostly on these commercial banks for their financial needs. Total assets of commercial banks are a reasonable indicator of the level of credit available in an economy, but it does not give a direction of the availability of credit to businesses. If most of the assets were made up of government loans and

[2] This is based on the traditional view that savings and other forms of deposits make investment. I have earlier cited alternative views in the previous sections.

other inter-bank loans, then its effects on businesses may be minimal. This measure is thus criticized on the grounds that it fails to indicate how the assets have been allocated in the economy.

5. *Total assets allocated to the private sector divided by GDP* (Levine and Zervos, 1998; Levine, 1998; Levine, 1997). The greatest strength of this measure is that it highlights clearly how the banking sector allocates credit. In most market economies, the private sector is undoubtedly the engine of growth. In such economies, it is only proper to be concerned more with how the private sector has access to loans and advances, which are important for production and other investment. The use of total credit in the economy fails to make this important distinction.
6. *The ratio of credit allocated to the private sector to total credit in the system (excluding inter-bank credits).* For this measure, it is assumed that financial development is directly related to the proportion of total credit in the system allocated to the private sector. In some developing countries, government borrowing, and other inter-bank loans account for a very large percentage of total credit; with this measure, those forms of financial systems would rightly be considered underdeveloped. Highlighting the rationale for emphasis on the private sector, Levine (1997) notes that financial systems that allocate more credit to the private sector are more involved in roles that would make for higher productivity, than financial systems that allocate more credit to the government sector. On this basis, it is therefore important that studies of the relationship between financial sector and economic growth should not ignore this measure. To buttress its

theoretical and intuitive appeal, this measure and (5) above have been used extensively as proxies for financial development. See for examples, Levine (1997), King and Levine (1993), Levine and Zervos (1998), Levine (1998), Rajan and Zingales (1998), and others. It is proper to note that governments are also important partners in the economic development process. Although the government may not be directly involved in production, it provides the infrastructure necessary for the smooth operation of businesses. Private corporations could also engage in unprofitable use of resources. However, emphasis on private sector credit could be justified on the assumption that private firms are more efficient users of funds on average.

7. *The difference between the stock of money and base money* – serves as an indication of the extent to which the banks have created money (Rousseau and Wachtel, 1998). This measure concentrates on a bank's money creation capability, and does not make any inference on how the money so created is applied in the economy.

## 3. Data and Methodology

This study uses quarterly data from 8 OECD countries. It is assumed that these countries have relatively similar institutional arrangements, because they are all at similar levels of development. Data on financial indicators and GDP are obtained from the International Monetary Fund *International Financial Statistics*. As mentioned in the introduction, this study uses two variables as proxies for financial sector development.

The ratio of private sector credit to Gross Domestic Product (GDP) is one such proxy, and the ratio of private sector credit to total credit in the system is another proxy. These variables improve upon those used in Shan and Morris (2002), because they have a more direct relationship with economic activities. By using the ratio of total credit to the GDP, Shan and Morris implicitly assumes that all or most of the credit in the economy is used to promote economic activities. As noted above, the use of total credit in an economy, as a proxy for financial sector development may be weak because, some of the loans and advances could be loans made to the government, which are not directly applied to pursue economic activities in the clearest form. Therefore, this paper's emphasis of total credit to the private sector is justified on the ground that private sector credit provides relative certainty regarding how, and where the credit is applied within the economy[3]. The problem with this measure is that an economy less dependent on credit, but with a high GDP, would appear to be financially underdeveloped, even if the financial sector is well developed.

It is important to point out that not all government loans are used for uneconomic political activities. The provision of basic social facilities and other infrastructure is

[3] Even when firms borrow to effect mergers and acquisitions, such borrowings are related to growth, because mergers/acquisitions could be undertaken for the purpose of increasing productivity through economies of scale.

critical for private sector growth. So, government spending substantially contributes to economic growth in many cases. Emphasis on private sector credit is usually justified on the basis that, in principle, all credit advanced to the private sector is directly meant for economic activities. The extent to which this is true is another issue for investigation, given events like the infamous Enron scandal. In relating credit to economic growth, loans made to the government are sometimes sidelined because of the difficulty in categorizing some government expenditure as either for political or for broad economic reasons. This paper acknowledges the fact that governments are important partners in the pursuit of economic growth. In recognition of this, we conduct a robustness check on the other variables using the ratio of total credit to GDP as a measure of financial development.

The second main proxy is a measure of total credit allocated to the private sector as a ratio of total domestic credit in the economy. This proxy improves upon the previous measure because it uses total credit in the system as its base, not the GDP. Use of this proxy as a measure of financial development is justified because in many developing economies, a large chunk of bank credit is extended to the government sector. But as noted above, the political party in power could use proceeds from these loans in ways that cannot conceivably bring about economic growth. It is assumed that in developed financial systems, the ratio of credit allocated to the private sector to total credit in the system would be relatively high. This proxy has been applied in Levine (1997). A weakness of this ratio is that it has a limit of 1, because private sector credit can never be above total credit in the system.

While King and Levine (1993), Levine (1997), and Rajan and Zingales (1998), among others, use cross-country data to model the relationship between financial development and economic growth, this study adopts a time series approach based on individual countries. There are several concerns with cross-country studies. First, there is the implicit erroneous assumption that what holds in country *A* is true for all the other countries. This assumption weakens the ability to identify specific country differences. Second, cross-section data, which typically results from cross-country studies, is not amenable to causality tests in the Granger framework. Indeed, Demetriades and Hussein (1996) present a strong critique of cross-section studies when they note that such studies are not able to allow different countries to exhibit their distinctive characteristics. They argue that cross-sectional studies could at best indicate the existence of correlation between finance and economic development.

This paper provides a useful contribution to the literature because it uses some of the proxies used by those adopting a cross-section approach, but it applies a time series analysis in order to overcome the weaknesses of cross-sectional approach. Proponents of the use of country time series point to the need to recognize specific country characteristics in the study, because causality patterns could vary across countries. This study argues that such recognition is important for both theoretical reasons and for reason of policy formulation. It is useful to recognize the effects of institutional structures in policy decisions. To highlight the importance of country-specific institutional structures, one would note that similar economic policies applied in different countries have been shown to produce widely different results. Therefore, if economic policies are to be relevant, they should take into account institutional differences in various countries.

Using quarterly time series from 1985 to 2001, this study applies Granger causality tests to identify whether financial development leads economic growth, or vice versa. As Gujarati (1995) notes "although regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causality", (p. 620). Therefore, an attempt to establish causality between two variables would necessarily imply a move away from the simple regression method. Granger causality tests are used in order to overcome the weakness of simple regression analysis. This study tests the following models:

$$Y = \sum_{i=1}^{n} \beta_1 PCREDIT_{t-i} + \sum_{i=1}^{n} \alpha_1 Y_{t-i} + \varepsilon \qquad (1)$$

Where

$Y$ = GDP growth rate

$PRCREDIT$ = Credit to the private sector divided by total credit in the economy

$\varepsilon$ = Error term

In this regression, if the coefficient of $\beta_1$ is statistically different from zero, we would conclude that financial sector development leads to economic growth. To provide for the possibility that causality runs in the other direction, we run the following regression:

$$PCREDIT = \sum_{i=1}^{n} \beta_2 PCREDIT_{t-i} + \sum_{i=1}^{n} \alpha_2 Y_{t-i} + \omega \qquad (2)$$

In the second model, if $\alpha_2$ is statistically different from zero using a joint F-test, we would conclude that economic growth leads financial development. If $\beta_1$ and $\alpha_2$ are both statistically different from zero, we would conclude that there exists a feedback or

bilateral causality between the variables. If neither $\beta_1$ nor $\alpha_2$ is statistically different from zero, the conclusion would be that none of the variables cause the other.

In equations 3 and 4, we use the variable *BANK* to replace *PCREDIT*. Similar tests are conducted to indicate whether financial development leads to economic growth.

$$Y = \sum_{i=1}^{n} \beta_3 BANK_{t-i} + \sum_{i=1}^{n} \alpha_3 Y_{t-i} + \mu \qquad (3)$$

and;

$$BANK = \sum_{i=1}^{n} \beta_4 PCREDIT_{t-i} + \sum_{i=1}^{n} \alpha_4 Y_{t-i} + \nu \qquad (4)$$

Where

$Y$ = Growth rate of GDP

*BANK* = Credit to the private sector divided by the GDP

$\mu$ and $\nu$ = error terms

These tests are conducted for each of the countries being studied. As in equations 1 and 2, if $\beta_3$ is significantly different from zero, we would conclude that financial development Granger causes economic growth. Similarly, if $\alpha_4$ is significantly different from zero, the conclusion would be that economic growth leads financial development. In the case that both $\beta_3$ and $\alpha_4$ are both significantly different from zero, we would conclude that there exists a bi-directional causality. If neither $\beta_3$ nor $\alpha$ is significantly different from zero, then our conclusion would be that no causality exists between the two variables.

The strength of this paper is that it identifies weaknesses from two diametrically-opposed approaches, and attempts to correct for the weaknesses by drawing on the strengths of the different approaches. This paper allows economic theory and conventional wisdom to guide its choice of variables, while keeping the econometric technique as simple, and as relevant as possible.

## 4. Analysis of Results

As noted in the previous section, each of the models is tested with data from one country at a time. Below is a summary of the results from the models defined in section 3.

### 4.1 Credit allocated to the private sector as a ratio of total credit in the economy *(PCREDIT)*

Table 1 presents results from derived from Equations 1 and 2:

**Causality between financial development *(PCREDIT)* and economic growth**

| **Country** | ***PCREDIT* causes growth** | **Growth causes *PCREDIT*** | **Causality pattern** |
|---|---|---|---|
| Australia | 0.536 | 0.033** | One-way |
| Canada | 0.515 | 0.146 | No causality |
| Denmark | 0.93 | 0.10* | One-way |
| Netherlands | 0.95 | 0.053* | One-way |
| Norway | 0.48 | 0.997 | No causality |
| Spain | 0.69 | 0.15 | No causality |
| Sweden | 0.96 | 0.006*** | One-way |
| U.S.A | 0.16 | 0.19 | No causality |

The values shown in the table are *p*-values.
*Significant at the 10% level
**Significant at the 5% level
***Significant at the 1% level

**Summary**

**Australia:** economic growth leads financial development

**Canada:** no causality

**Denmark:** economic growth leads financial development

**Netherlands:** economic growth leads financial development

**Norway:** no causality

**Spain:** no causality

**Sweden:** economic growth leads financial development

**U.S.A**: no causality

### 4.2 Credit allocated to the private sector as a ratio of GDP *(BANK)*

Table 2 presents results from derived from Equations 3 and 4:

**Causality between financial development *(BANK)* and economic growth**

| **Country** | ***BANK* causes growth** | **Growth causes *BANK*** | **Causality pattern** |
|---|---|---|---|
| Australia | 0.57 | 0.17 | No causality |
| Canada | 0.48 | 0.56 | No causality |
| Denmark | 0.58 | 0.61 | No causality |
| Netherlands | 0.83 | 0.17 | No causality |
| Norway | 0.35 | 0.99 | No causality |
| Spain | 0.95 | 0.89 | No causality |
| Sweden | 0.82 | 0.047** | One-way |
| U.S.A | 0.01*** | 0.397 | One-way |

The values shown in the table are *p*-values
*Significant at the 10% level
**Significant at the 5% level
***Significant at the 1% level

**Summary**

**Australia**: no causality

**Canada**: no causality

**Denmark:** no causality

**Netherlands:** no causality

**Spain**: no causality

**Sweden**: economic growth leads financial development

**U.S.A**: financial development leads economic growth

From the above results, it is difficult to make conclusive general statements on issues of causality between finance and economic growth. The results seem to be in consonance with real life situation: it does not appear that a specific direction of causality exists for all countries. Economic growth could lead to an increase in the financing needs of firms and business, which would then spur the financial sector to devise new products and services. On the other hand, improved financial intermediation may put more flexible credits at the disposal of firms and businesses, thus leading to growth in GDP.

Using the ratio of private sector credit to total credit, the results show that causality runs from economic growth to financial development in 4 countries. In the other 4 countries, there were no traces of causality. As noted previously, this measure *(PCREDIT)* is constrained because it cannot have a value more than 1. This constrained maximum has the potentials of affecting test results. Statistically, it is also problematic since one may no longer assume normal distribution.

With the ratio of private sector credit to the GDP, test results could not show any causality in 6 countries. Causality runs from financial development to economic growth in the case of United States, while Sweden displays causality from economic growth to financial development. This measure *(BANK)* is an improvement over *PCREDIT* because it can take on any value. Unlike *PCREDIT*, *BANK* has no constrained maximum. If emphasis is placed on results obtained from the use of *BANK,* then the evidence tends towards the view that none of the variables causes the other in general.

Given that test results differ with each of the two measures of financial development, further tests are needed in other to make informed inference. We conduct a robustness check by using the ratio of total credit to GDP as a measure of financial development. Results from this variable are presented in the table below:

**Table 3**

**Causality between financial development *(Total credit/GDP)* and economic growth**

| **Country** | ***Finance* causes growth** | **Growth causes *finance*** | **Causality pattern** |
|---|---|---|---|
| Australia | 0.61 | 0.33 | No causality |
| Canada | 0.55 | 0.36 | No causality |
| Denmark | 0.65 | 0.63 | No causality |
| Netherlands | 0.77 | 0.35 | No causality |
| Norway | 0.38 | 0.95 | No causality |
| Spain | 0.79 | 0.47 | No causality |
| Sweden | 0.70 | 0.063* | One-way |
| U.S.A | 0.003*** | 0.62 | One-way |

The values shown in the table are *p*-values
*Significant at the 10% level
**Significant at the 5% level
***Significant at the 1% level

**Summary**

There is no causality in all the countries, except in Sweden and in the U.S.A. In Sweden, causality tends to run from economic growth to financial development, measured as *total credit divided by the GDP.* But the level of significance is weak (10% level). At the 5% level, we would conclude that there is no causality here. In the U.S.A, causality runs from financial development to economic growth.

Results shown in Table 3 reinforce those derived from using the variable, *BANK*. Therefore, it is safe to conclude that there is no significant evidence to suggest that causality necessarily runs in one direction. Neoclassical interpretation of financial intermediation may tend towards asserting causality in a certain direction, but the evidence presented in this paper suggests otherwise. Furthermore, results shown in Table 3 tend to imply that the ratio of total credit to GDP may not be a weak measure of financial development, as it has been portrayed in the literature. However, this study has considered only developed countries with relatively transparent governments compared to governments of developing countries. Using total credit in studies involving some developing countries may produce different results.

Analytically, the results presented in this study are not puzzling. The results actually reinforce the view that it could be misleading to assume the existence of causal relationships between financial development and economic growth. What may be a source for concern is the difference in results from very similar countries like Canada and the U.S. To provide an explanation to this puzzle, further studies are certainly called for.

## 5. Conclusion and Policy Implications

It is clear that the financial sector plays important roles in ensuring the smooth conduct of businesses. Schumpeter had long articulated the important role of finance in ensuring that profitable projects are not abandoned due to lack of funds. What is yet to be established is whether financial development, however defined, leads to economic growth. Results from this study do not provide a strong basis to reach a general conclusion about patterns of causality in every country.

While some studies have merely used a simple regression framework to show the existence of significant relationship between the two variables, this study has reemphasized the fact that existence of statistically significant relationship between two variables does not give enough ground to assert that one variable causes the other. On the policy angle, many policy prescriptions have been anchored on the assumption that a financial development would bring about economic growth. For example, banking liberalization in most countries have been pursued on the assumption that such liberalization would improve banking sector efficiency, make credit more available to those in need, and ultimately spur economic growth. The now famous banking crisis, which followed liberalization in some countries have shown that the mere availability of credit to firms and individuals is quite different from economic growth. Indeed, Baghwati (1998) made it clear that the increased use of credit, which followed financial liberalization, could cause problems in the economy because firms tend to exceed their optimal debt-to-equity ratio when credit is readily available.

This paper reiterates the advice to policy makers that economic development strategies should not place unduly high emphasis on the financial sector alone.

Experience with developing economies such as those of East Asia and Africa has shown that overall macroeconomic stability should be the primary emphasis at the initial stages of development. Financial development and economic growth are more likely to be achieved when other development concerns have been fully addressed. In developed countries with relatively stable macroeconomic environment and functional infrastructure, there is no conclusive evidence that finance leads economic growth or vice versa, because the results show different directions of causality in some countries, and no causality in others. It is noteworthy that results presented in Table 1 tend to support the view that economic growth leads financial development. However, when all test results are considered, there is no conclusive evidence to infer causality in either direction.

In general, results presented in this study tend to support those of Shan and Morris (2002) and Demetriades and Hussein (1996) that specific industrial and institutional structures in different countries influence the linkages between financial development and economic growth. Such conclusion provides another support for the concerns of institutional economists who argue that institutional structures affect policy outcomes. Further research on this subject may do well to explain why countries in similar levels of development, and with relatively similar institutional structures such as Canada and the United States behave differently with respect to the link between finance and economic growth.

**References**


Arestis, P. and Demetriades, P. (1997). Financial Development and Economic Growth: Assessing the Evidence. *Economic Journal*, 107, 783-799

Bagehot, W. (1873). *Lombard Street.* Homewood, IL: Richard D. Irwin; 1962 edition

Bhagwati, J. (1998). The Capital Myth: The Difference between Trade in Widgets and Trade in Dollars. *Foreign Affairs*, May-June, 7-12

Creane, S., Goyal, R., Mobarak, A., and Sab, R. (2003). *Financial Development in the Middle East and North Africa.* Washington: International Monetary Fund

Cooley, T. and Smith, B. D (1992). *Financial Markets, Specialization and Learning by Doing*; Cornell University Mimeo

De Gregorio, J. (1996). Borrowing Constraints, Human Capital Accumulation, and Growth. *Journal of Monetary Economics*, 37(1), 49-71

Demetriades, P. and Hussein, K. (1996). Financial Development and Economic Growth: Cointegration and Causality Tests for 16 Countries. *Journal of Development Economics*, 5, 387-411

Demirguc-Kunt, A., Levine, R. and Min, F. G. (1998). Opening to Foreign Banks: Issues of Stability, Efficiency, and Growth, in *The Implications of Globalization of World Financial Markets*, Ed. Seongtae Lee. Seoul: Bank of Korea

Goldsmith, R. W. (1969). *Financial Structure and Development.* New Haven, CT. Yale University Press

Granger, C. W. (1969). Investigating Causal Relations by Econometric Models and Cross-Spectral Methods. *Econometrica*, 424-438

Greenwood, J. and Jovanovic, B. (1990). Financial Development, Growth, and Distribution of Income; *Journal of Political Economy*, 98(5), 1076-7707

Gujarati, D. (1995). *Basic Econometrics*, New York: McGraw-Hill

Hicks, J. (1969). A *Theory of Economic History*; Oxford: Clarendon Press

International Monetary Fund; *International Financial Statistics*, On-line resource

Jensen, M. and Meckling, W. R. (1976). Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. *Journal of Financial Economics*, 3, 305-360

King, R. G. and Levine, R. (1993). Finance and Growth: Schumpeter Might Be Right. *Quarterly Journal of Economics, 108*, 713-737

Lavoie, M. (1985). Credit and Money: The Dynamic Circuit, Overdraft Economics and Post Keynesian Economics, in *Money and Macro Policy*, Ed. M. Jarsulic. Boston: Kluwer Nijhoff

Lavoie, M. (1996). Monetary Policy in an Economy with Endogenous Credit Money, in *Money in Motion: the Post Keynesian and Circulation Approaches*. Eds. Ghislain Deleplace and Edward J. Nell. New York: St. Martin's Press, Inc

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature, 35*, 688-726

Levine, R. (1998). The Legal Environment, Banks, and Long-Run Economic Growth. *Journal of Money, Credit, and Banking, 30,* 598-613

Levine, R. and Zervos, S. (1998). Stock Markets, Banks, and Economic Growth. *American Economic Review, 88,* 537-558

Lucas, R. E. Jr. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22, 3-42

McKinnon, R. I. (1973). *Money and Capital in Economic Development*. Washington, D.C. Brookings Institution

Moore, B. J. (1988). *Horizontalists and Verticalists: The Macroeconomics of Credit Money*. Cambridge: Cambridge University Press

Rajan, R. G and Zingales, L. (1998), Financial Dependence and Growth. *American Economic Review*, 88(3), 559-586

Robinson, J. (1952). The Generalization of the General Theory, in *The Rate of Interest, and Other Essays*. London: Macmillan

Rousseau, P. and Wachtel, P. (1998). Financial Intermediation and Economic Performance: Historical Evidence from Five Industrialized Countries. *Journal of Money, Credit, and Banking*, 30, 657-677

Schumpeter, J. A., (1912). *The Theory of Economic Development*. Cambridge MA: Harvard University Press

Seccareccia, M. (1996). Post Keynesian Fundism and Monetary Circulation, in *Money in Motion: the Post Keynesian and Circulation Approaches*. Eds. Ghislain Deleplace and Edward J. Nell. New York: St. Martin's Press, Inc

Shan, J., and A. Morris (2002). Does Financial Development 'Lead' Economic Growth? *International Review of Applied Economics*, 16, 153-168

Sirri, E. R. and Tufano, P. (1995). The Economics of Pooling, in *The Global Financial System: A Functional Perspective*; eds. Dwight B. Crane et al. Boston: Harvard Business School Press

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*. London: W. Stahan & T. Cadell

Spears, A. (1992). The Role of Financial Intermediation in Economic Growth in Sub-Saharan Africa. *Canadian Journal of Development Studies*, 13, 361-380

Williamson, S. D. (1987). Financial Intermediation, Business Failures, and Real Business Cycles. *Journal of Political Economy*, 95(6), 1196-1216

World Bank (1989), *World Development Report*, Washington DC: Oxford University Press