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Finance and Growth: Institutional Considerations, Financial Policies and Causality

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Abstract: Authors in this article suggest that country specific institutional factors and policies are likely to influence the causal nature of the relationship between financial development and economic growth. Authors conduct cointegration and causality tests using time series data for twelve representative countries. The empirical results show considerable variation of causality across countries which can be explained by institutional and policy differences, providing support to our main hypothesis.

JEL Classification: O16, O23, E44

Keywords: financial development, economic growth, causality, financial system

Introduction

There is widespread agreement amongst economists that financial development is robustly correlated with long-run economic growth (World Bank, 1989; Fry, 1995; King and Levine, 1993; Levine and Renelt, 1992; Levine and Zervos, 1993; Arestis

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and Demetriades, 1997). There is, however, less consensus as to whether the development of the financial sector is likely to promote economic growth. This is because the relationship may be due to reverse causation, i.e. economic growth may lead to increased demand for financial services which, in turn, leads to the development of the financial sector. For example, Joan Robinson (1952, p. 86) argued that 'where enterprise leads finance follows'. Interestingly, Friedman and Schwartz (1963, p. 639) also argued along similar lines by treating the services provided by money as a luxury good.

The direction of causality between financial development and economic growth has crucial implications for development policy. If causality runs from the former to the latter then poor economies will be unable to develop without a sufficiently developed financial sector. On the other hand, if the direction of causality runs from economic growth to financial development poor economies need to look elsewhere for their development efforts.

The importance of establishing the direction of causality between financial development and economic growth was first identified by Patrick (1966), further developed by Goldsmith (1969) and, more recently, by McKinnon (1988) who argued that: ' Although a higher rate of financial growth is positively correlated with successful real growth, Patrick's problem remains unresolved: What is the cause and what is the effect? Is finance a leading sector in economic development, or does it simply follow growth in real output which is generated elsewhere?' (p. 390). Recent empirical studies of the causality issue suggest that it is indeed likely that the financial sector may be able to promote economic growth. King and Levine, using cross-country growth regressions for the period 1960 to 1989, find that financial development helps predict future growth in a sample of 57 countries. Demetriades and Hussein (1996), however, in a time-series study of sixteen developing economies find that the direction of causality varies considerably across countries. Specifically, whilst finance appears to Granger-cause economic growth in fifteen countries, the reverse is true only in seven countries. Thus, whilst there is bi-directionality in seven countries, causality runs from growth to finance in another seven and there is uni-directional causality from finance to growth in only one case.

The aim of this paper is to examine the variations in causality across countries in more detail, focusing not only on developing but also on developed countries. We argue that causality may vary across countries due to differences in

i) the structure of the financial system,
ii) the financial policies pursued and
iii) the degree of sound governance.

We conduct cointegration and causality tests using time series data for twelve representative countries. The empirical results show considerable variation of

causality across countries which can be explained by institutional and policy differences, providing support to our main hypothesis.

Finance, Economic Growth and Causality: Conceptual Issues

Finance and Economic Growth

According to the endogenous growth literature, the financial system can influence the growth rate permanently through one of the following channels (Pagano, 1993):

(i) Improving the average productivity of capital: the financial system is responsible for channelling funds from surplus to deficit units (funnelling). In this process, financial intermediaries collect information and evaluate alternative investment projects (screening). They may also engage in monitoring borrowers to ensure that the loaned funds are efficiently utilised. The more effective the functions of screening and monitoring, the more productive the investments which are financed. Thus, a well functioning financial system may contribute to the average productivity of capital.

Another way in which the financial system may improve the productivity of capital is by inducing individuals to invest in riskier but more productive technologies by providing risk sharing opportunities. There are several theoretical models which model the risk sharing aspects of financial intermediation and which show that savings channelled through financial intermediaries are allocated more efficiently and that the higher productivity of capital results in higher growth (e.g. Greenwood and Jovanovic, 1990; Bencivenga and Smith, 1991).

(ii) Channelling investment funds to firms: In the process of financial intermediation, the intermediaries themselves absorb real resources. These resources in some part reflect the reward for services provided. However they may also reflect the efficiency of the process of financial intermediation. The less efficient this process is the fewer resources are made available for investment out of a given amount of saving. Inefficiencies in financial intermediation may be technical ones, e.g. inferior deposit collection and loan technologies, which may in turn be the result of outdated technologies, rigidities and bureaucratic controls or insufficiently trained or educated bank personnel. A technically inefficient financial system will experience high costs in mobilising saving and channelling these funds to investors. These higher costs will be passed on to both lenders and borrowers in the form of low deposit rates and high lending rates, commissions, fees and the like. They represent a real resource cost to the economy: resources which could have been invested in the real economy are instead swallowed up by the financial system in the process of intermediation.

(iii) Saving: by mobilising saving the financial system influences the amount of resources devoted to capital accumulation. However, the effect of financial development on saving is not unambiguous. This is because financial development may enhance risk sharing opportunities, allowing individuals to share both endowment risks (e.g. health risks) and rate-of-return risks (e.g. volatility of equity returns). For example, it is well known that the introduction of insurance markets may reduce the need for precautionary saving (e.g. health insurance).

The inefficiencies described in (ii) above provide another mechanism for negative effects on saving. Large spreads between deposit and lending rates, which are either due to technical inefficiencies or oligopolistic tendencies, depress the rate of return to saving and increase the cost of investing both of which are likely to lead to lower volumes of saving and investment. Thus, addressing inefficiencies in the financial system is likely to be doubly useful, working on growth through raising the amount of saving and, secondly, through the amount of saving that is intermediated (i.e. being made available for investment).

Causality

The above analysis suggests that the financial system is capable of promoting economic growth. However, in reality its ability to do so is likely to be influenced by country specific factors such as its institutional structure, the financial sector policies followed and the quality of non-financial institutions. As a result each of these factors is also likely to have a bearing on the causality between financial development and economic growth. We examine in detail how this may happen by drawing on three types of literature: i) the literature pertaining to the distinction between 'bank-based' and 'internally-financed' financial systems ii) the literature on financial repression and liberalisation and iii) the literature on corruption and governance.

Financial Structure

The literature on the institutional differences amongst financial systems utilises as a starting point Gerschenkron's (1962) taxonomy which divides financial systems into two categories: the 'bank-based' and the 'capital-market-based' financial systems (see, also Mayer, 1987, and Frenkel and Montgomery, 1992). The main characteristic of 'bank-based' financial systems is that companies rely heavily on bank loans and not so much on equity, with banks exercising an important monitoring role. Thus, banks play a key role in the process of allocating investment funds, and therefore

affect economic growth through influencing the productivity of the capital stock. A good example of such a system is the Japanese. 'Capital-market-based' financial systems, on the other hand, are characterised by highly developed capital markets and banks which have relatively low involvement in the allocation of funds or ownership of financial assets. An important aspect of these financial systems is their international dimension which weakens their links with their domestic industries[1]. The UK and US financial systems appear to fall into this category.

Recent empirical work, however, has questioned the distinction between 'bank-based' and 'capital-market-based' financial systems. For example, Mayer (1988, 1990, 1994) puts forward the 'pecking order' theory of finance which suggests that firms prefer internal to external finance, and within the external category debt finance to equity. In the Japanese 'bank-based' financial system, bank finance and bank control of firms are both very important with the less developed equity markets providing a mechanism for residual finance. Japan remains the country with the lowest share of internal finance and with the highest external financing. A 'balanced external finance' is prevalent in this country, with bank finance being the major source.[2] In the UK, US, Germany and probably France, internal finance is the most important source, with bank finance and bank control of firms being significantly less important. This system is, therefore, better described as 'internally-financed'. Corbett and Jenkinson (1994), using 'net finance' as the appropriate concept for international comparisons, suggest that finance in UK, US and Germany, but not in Japan, is predominantly internal with small use of 'market sources'. They conclude that the Anglo-US financial pattern in particular is not 'market based' but 'internally financed'; in fact 'Market sources of finance made a negative contribution to UK investment ..... while in the US the contribution was around 8 per cent' (op. cit., p. 14). Similarly, in Germany 'bank borrowing is both relatively unimportant in aggregate and, if anything, appears to have been declining as a source of finance' (op. cit., p. 20).[3] While their highly developed equity markets play a disciplinary role on mergers, they do not provide large proportions of funds to industry. The self-financing ratio is considerably higher for the UK and US than for Japan and France, with Germany being in an intermediate position. Bank-finance is more dominant in Japan than in the other countries, but in terms of sources of finance Germany and France should be grouped with the UK and US. The clear implication of these contributions is that Japan is the only country which has retained its 'bank-based' features. In the other cases considered the financial systems appear to possess characteristics commonly found in what is described as an 'internally-financed' system.

This analysis implies that the causality between financial intermediation and economic growth is likely to be from finance to growth in the case of the 'bank-based' systems. In 'internally-financed' systems causality is expected to be from growth to

finance although a bi-directional relationship is also likely. Moreover, when the role of government is examined this conclusion may be reinforced. The government is expected to play a rather more limited role in administering prices and quantities in 'internally financed' than in 'bank-based' financial systems. Given the greater integration between financial and industrial firms, 'bank-based' financial systems may be in a better position to implement successfully industrial strategy. In the 'internally financed' systems where financial firms are not directly linked to industry, the financial system is more independent and more likely to favour restrictive policies. Zysman (1983) has argued that in the financial systems of the UK, Germany and US, and France to a lesser extent, the government's role is limited, contrary to the Japanese 'bank-based' financial system where the government has a strong presence and participates actively in the allocation of credit to industry. In this sense we postulate that we have the Japanese financial system on one hand, where finance leads growth and the 'rest' on the other, where growth leads finance, although in this case bi-directionality is not ruled out.

Financial Policies

The literature on financial repression and liberalisation (for an extensive survey see Fry, 1995) suggests that a liberalised financial system is in a better position to promote economic growth than a repressed one. In a repressed financial system real interest rates are kept artificially low by the government. Financial development fails because the real return on bank deposits is too low or even negative. The limited amount of available loanable funds is typically rationed in accordance to government directives which, in turn, reduces the quality of investment. Thus, economic growth may suffer because both the quantity and the quality of investment are low. On the other hand, financial liberalisation leads to market determined interest rates which are more attractive for surplus units which now deposit their savings with the banking system. Financial deepening occurs and the increase in funds allows a greater volume of investment to take place. The quality of investment also improves because of the abolition of directed credit programmes and because investment projects must now be able to earn higher, market determined, rates of return in order to be commercially viable. Thus, financial liberalisation implies a positive association between financial development and economic growth with the direction of causality running from the former to the latter. Nonetheless, financial repression does not preclude a positive association between financial development and economic growth. However, financial deepening under a repressed financial system may not be as effective in promoting economic growth than under a liberalised system. This may be due to the presence of directed credit programmes and concessionary lending rates both of

which have implications for the quality of investment. Thus, it seems to us that the implication of the financial repression/liberalisation literature must be that the causal link between financial development and growth must be stronger under liberalised conditions than under repressed conditions.

The financial repression/liberalisation literature is not without its critics (for a survey see Arestis and Demetriades, 1993). Besides the well-known neo-structuralist critique (e.g. Van Wijnbergen, 1983), which emphasises the importance of curb markets, there are important recent objections emanating from a New-Keynesian perspective. Under conditions of imperfect information - as is normally the case in financial markets - certain government policies, including financial repression may be able to address market failure (e.g. Stiglitz, 1994; Demetriades and Luintel, 1996a). Financial repression, in the form of directed credit, may also be able to address market failure outside the financial system. For example, the cases of S. Korea and Japan are often cited as cases where financial repression was able to contribute to export-led industrial growth (e.g. World Bank, 1993; Patrick and Park, 1994). In these conditions the link from financial development to economic growth may actually be stronger under financial repression than under liberalisation.

Governance

It is now widely recognised that there may be government failure as well as market failure. Even if there is financial market failure, government policies designed to address such problems may make matters worse (e.g. Demetriades and Luintel, 1996a, 1996b). This is where the importance of good governance comes into play. The same kind of policies may work very differently across countries because of differences in the effectiveness of the institutions which implement them (see for example Demetriades, Devereux and Luintel, 1994). An effective and uncorrupt civil service is in a better position to design and implement policies which address market failure than an ineffective and corrupt one which is seen as acting as a tax on the productive activities of the economy (World Bank, 1993). For example, bribing officials to obtain permits and licenses by investors, giving passages through customs, prohibiting the entry of competitors etc., become the focus of activity in corrupt economies. Corruption is both 'pervasive and significant' in both developing and developed countries (Shleifer and Vishny, 1993), and is costly to economic development for two reasons: the weakness of the central government which allows corrupt bureaucrats to stop productive projects from materialising, thus hampering investment; and the necessary secrecy of corruption which can entail shifts in investment away from high-valued projects to 'useless' projects if these provide better opportunities for secret corruption.

Under these circumstances a number of bureaucrats assume 'hold up' powers over investment projects. If the sum total of bribes is greater than the gains from setting up the investment, the latter can be severely cut (Shleifer and Vishny, 1993). Indeed, a recent study by Hall and Jones (1996) demonstrates that differences in levels of economic performance across countries are due to the institutional framework and government policies. Economies with secure physical and intellectual property rights are more successful than economies where the diversion of resources is encouraged in view of activities such as theft, corruption, litigation, expropriation etc. (Knack and Keefer, 1995). This diversion of resources can have in its turn significant consequences for the allocation of talent, in that talented people devote their energies in unproductive activities, such as rent seeking or organised crime, which imply diversion of resources (thus redistribution of wealth), rather than investing in productive projects and thus wealth creation (Baumol, 1990; Murphy, Shleifer and Vishny, 1991). By contrast, economies which have successfully developed their infrastructure by favouring productive activities such as investment in innovation over diversion of resources, have been more successful and have done so through *effective* government, including a strong judiciary and secure property rights (Hall and Jones 1996). Consequently, a successful infrastructure encourages capital accumulation and thus production, and a perverse infrastructure discourages production in ways which are not conducive to economic performance and growth. In economies where infrastructure favours diversion over production, the implications are rather severe: capital stock per worker, skills, new ideas, and total factor productivity are all reduced. Even when some of the investment materialises, it is channelled into diversion rather than into productive purposes (Hall and Jones 1996).

The quality of non-financial institutions may also have a bearing on the relationship between financial development and growth, particularly in countries where the banking system is either state-owned or tightly controlled by the government. In such cases, the existence or otherwise of sound governance is likely to have a crucial influence on the banking system's ability to promote economic growth. Under conditions of widespread corruption the banking system is likely to become an instrument of rent-seeking by civil servants and politicians who direct credit to socially unproductive activities. Over time, poor lending decisions are likely to lead to a deterioration of banks' loan portfolios, manifested in a large volume of non-performing or doubtful loans. In such circumstances, financial institutions may become 'distressed' in that they may be technically insolvent whilst continuing to operate, either by concealing their problems or by obtaining government support. In such case their ability to finance productive investments and, therefore, to promote growth would be severely undermined. This is because financially distressed banks tend to extent credit to their least solvent clients to allow them to service prior loans.

This reduces their ability to finance productive firms and prolongs the lives of insolvent ones.

Another important symptom of unsatisfactory governance is inadequate bank supervision. It is now widely recognised that bank supervision failures contributed to financial fragility, especially during episodes of financial liberalisation in Latin America and other countries. During these episodes real interest rates climbed to too high levels and banks were typically allowed to engage in excessively risky lending. Adverse real shocks then led to a large volume of non-performing loans and subsequent financial fragility and crisis (Villanueva and Mirakhor, 1990; World Bank, 1989).

In conclusion, financial systems operating under conditions of poor governance, manifested in poorly designed or corruption prone directed credit programmes, inadequate bank supervision and the like, are unlikely to be able to promote growth. We may thus postulate that in such economies the ability of the financial system to promote economic growth would be severely hampered. On the other hand, in economies which benefit from sound governance the causality is likely to be from finance to growth.

Methodological Issues and Data

This section puts forward our methodology for testing the hypotheses put forward above. It outlines the testing procedures, explains the choice of countries in our sample and provides definitions of the variables used and the data sources.

Econometric Methodology

Time series testing procedures for causality are complex when the variables have unit roots. This is, of course, very common in macroeconomics and one way to proceed is to utilise the model in the equivalent error correction model. In a bivariate framework this is given as follows (Engle and Granger, 1987; Johansen, 1988):

$$\Delta X_t = \mu + \Gamma(L)\Delta X_{t-1} + P_o X_{t-1} + \epsilon_t \qquad (1)$$

where $X_t = (x_{1t}\ x_{2t})'$, $\mu = (\mu_1\ \mu_2)'$, $\Gamma(L) = \{\gamma_{ij}\}$, $P_o = [\Pi - I_2]$, $\Pi = \{\pi_{ij}\}$, and $\epsilon_t = (\epsilon_{1t}\ \epsilon_{2t})'$, Π is the matrix of long-run parameters and I_2 is a 2x2 identity matrix.

The number of unit roots in the characteristic polynomial is crucial in testing for causality. When there is *one* unit root in (1) this corresponds to the definition of cointegration given by Engle and Granger (1987), where x_1 and x_2 are integrated

processes of order 1 but there is a linear combination, $\beta' X_t$, which is stationary. In such a case $P_0 = \alpha\beta'$ and the 2x1 vectors α and ß are both different from zero, where α represents the speed of adjustment to disequilibrium, and β is the matrix of long-run coefficients; so that $\beta' X_{t-1}$ represents the cointegrating relationships. Equation (1) can then be re-written as follows:

$$\Delta X_t = \mu + \Gamma(L)\Delta X_{t-1} + \alpha(\beta' X_{t-1}) + \epsilon_t \qquad (2)$$

so that if x_1 and x_2 are $I(1)$ and cointegrated, causality tests can be carried out using the ECM as in (2). In this formulation there are two sources of causality: one through the lagged dynamic term ΔX_{t-1}, and another through the lagged cointegrating vector $\beta' X_{t-1}$. It clearly is the case that failure to include the error correction term in cointegrated I(1) processes inevitably results in mis-specified models which can lead to erroneous conclusions in so far as causality is concerned. Furthermore, Toda and Phillips (1993) suggest that Johansen-type ECMs offer a sound basis for causality testing. This is true even if they involve some loss of efficiency in view of the fact that in this type of testing the rank of the cointegrating matrix and the loading coefficient matrix are first determined and then the test for causality is conducted.

This is the procedure we adopt in what follows. We thus carry out unit root tests employing the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) tests. Cointegration tests are carried out using the well known procedure of Johansen (1988). The two tests described by Johansen and Juselius (1990) to determine the number of cointegrating vectors are utilised throughout. The first is based on the maximal eigenvalue (given by $J_{ME} = -T\ln(1-\lambda_r)$, where T is the number of observations and λ_r is the maximal eigenvalue) and is designed to test the hypothesis $H(r)$: Rank $(P_0) = r\text{-}1$, against the alternative $H(r\text{-}1)$. The second is based on the trace of the stochastic matrix and is defined as $J_t = -T\sum_i \ln(1-\lambda_i)$. In a bivariate system the maximum number of cointegrating vectors is one so that the null hypothesis is that there is no cointegrating vector and the alternative is that there is one cointegrating vector. Finally, our causality test is essentially a test of the statistical significance of the lagged cointegrating vector in each of the equations. This test is in terms of equation 2 above, and checks whether $\alpha_1 = 0$, which is a test of whether x_1 is exogenous, and/or whether $\alpha_2 = 0$, which is a test of whether x_2 is exogenous. This is the test for weak exogeneity suggested by Johansen (1992), and is one which focuses primarily on the long-run causality between finance and growth (see, also, Hall and Milne, 1994). Weak exogeneity exists when the long run solution to, say, x_1 is not affected by the level of x_2 and does not react to disequilibrium errors, that is to say departures from the equilibrium as defined in the cointegrating vector. In the weak exogeneity case, therefore, x_1 may still react to lagged changes in x_2. If, however, x_1 is not affected by lagged differences of x_2, in addition to being impervious to level

changes and disequilibrium errors, then strong exogeneity is implied (Johansen, 1992, p. 130; Hall and Milne, 1994, p. 600).

Sample of Countries, Variables and Data

Our sample of countries encompasses a variety of different experiences in relation to financial systems, financial policies followed and, almost by definition, levels of governance. The sample includes the US, the UK and Germany which are the closest examples of 'internally-financed' systems. Japan is included as probably the most obvious case of a 'bank-based' system. Japan is also important from the financial-repression perspective as for a long period it employed policies which resembled 'financial repression'. We include S. Korea, which is a more recent case of a system under financial repression. The sample also includes France, the financial system of which probably has features which are similar to the 'internally-financed' financial system. This proposition assumes greater significance in view of Bertero's (1994) recent finding that internal financing in this country is an important source of finance. Furthermore, bank loans to industry as a percentage to GDP in France are significantly lower to that of, say, Spain's or indeed Germany's (Vinals et al, 1990, p. 184). In any case, banks in France do not play an important role in the control of firms. In this sense it may very well be that the French system is far from being labelled as a 'bank-based' financial system.

Additionally, our sample includes the following countries: India, Spain, Greece, Turkey, Chile and Mexico. The most important common characteristic of these countries is that their banking sectors were either nationalised, fully or partially, during the period under investigation, or else under the grip of national governments. Interest rates were set administratively by the central banks, alongside credit rules and regulations. Domestic economic policies were actively pursued, which aimed to protect industrial activity in a conspicuously selective manner. A dirigiste control of credit by public sector banks was used over the period as an important means by the state to influence the private sector, but in most cases this was based on political expediency rather than on economic criteria. A further consideration which is particularly pertinent to these countries, is that their banking systems suffered from financial distress, in view of the alarming incidence of non-performing loans which tended to grow as their service was capitalised into new loans. These observations suggest that the relationship between finance and growth in these countries may have been weak with causality more likely to run from growth to finance.

Variables and Data

Following Demetriades and Hussein (1996), we employ two financial indicators. The first financial indicator is the logarithm of the ratio of bank deposits to nominal GDP (LDEPY), which essentially measures the size of the banking system's liabilities in relation to the level of economic activity. The second indicator is the logarithm of the ratio of bank credit to the private sector to nominal GDP (LPCY), which reflects more accurately the degree of financial intermediation by the banking system. The numerator of this ratio corresponds to credit granted to the private sector by the central bank and commercial banks (line 32nd or line 22nd plus line 12th from the IMF's *International Financial Statistics*). It must, however, be noted that bank credit to the private sector does not capture financial intermediation that occurs outside the banking system, although the two types of financial intermediation may be positively correlated (De Gregorio and Guidotti, 1993, p. 14).

Economic development is proxied by real GDP per capita measured in domestic currency. There are, of course, well known problems with data, especially with developing-country data (Srinivasan, 1994). The real GDP per capita variable, however, appears to be the least troublesome in a number of ways, most important of which is that the same errors that affect GDP are also responsible for distortions in population statistics, and they are thus offsetting in terms of their impact on the ratio registering economic development.

The data for all variables are from the IMF publication *International Financial Statistics* (CD ROM, 1993). Data limitations dictated that different sample periods were utilised for each country, ranging from 1949 to 1992.[4]

Empirical Evidence

We begin with the unit root tests using the DF/ADF procedure referred to earlier, for the four variables GDP (which is the real per capita GDP), LDEPY, LGDP and LPCY, where the letter L in front of a variable means the logarithm of that variable. The null hypothesis for both the DF and the ADF tests is that the variable in question has a unit root against the alternative hypothesis that the variable is trend stationary. Careful inspection of the results of this procedure indicates that all four variables are I(1).[5] Whenever the tests were not comfortably within the critical values, the standardised spectral density function (see, for example, Engle and Yoo, 1989) along with the Phillips (1987) and Phillips and Perron (1988) procedure (which modifies the DF test to account for heteroscedasticity and/or serial correlation) were employed; they confirmed whenever they were used that all variables are I(1). A further comment is that in all estimated equations the VAR lag length (k) is

determined by the absence of serial correlation and heteroscedasticity. The tests used for this purpose are F-approximations which are appropriate for small samples (see Harvey, 1990 and Kiviet, 1986).

Given the results of the unit root tests it is necessary to use cointegration methodology in order to test the existence of a stable relationship between economic development as proxied by the level of real per capita GDP and the state of financial development as captured by LDEPY and LPCY. This is done using the Johansen (1988) procedure, where in Tables 1A and 2A the Johansen tests are reported. These are based on maximum likelihood estimates of a vector autoregression of orders 2, 3 and 4. The null hypothesis is that there is no cointegration vector against the alternative that there is one cointegrating vector. We report both the maximal eigenvalue and trace test for each lag length which also enables us to examine whether the outcome of the cointegration test is sensitive to the order of VAR. The results actually appear to be sensitive to the lag length of the VAR as expected (Banerjee et al, 1993), and whenever relevant we rely more on the longer lag lengths given that the Johansen test statistics are more sensitive to under-parameterisation than to over-parameterisation (Cheung and Lai, 1993).

In Table 1A we report cointegration tests between LDEPY and LGDP, where non-cointegration is rejected in the cases of Japan (four lags), S. Korea (one lag), India (four lags), Greece (three and five lags), Spain (four lags) and Chile (one lag). What is particularly noticeable in Table 2A, which uses LPCY with LGDP, is that the existence of non-cointegration between LPCY and LGDP is rejected in all cases (with the exception of Chile) with varying degrees of lag length. Thus, in all twelve countries considered in this paper, there appears to be evidence of a stable relationship between at least one indicator of financial development and real per capita GDP. It is interesting to note the strong evidence of stability of the relationship in South Korea, India, and Greece, countries in which financial reforms took place and which could be the source of structural breaks. On the other hand, financial reforms also took place in Chile, Mexico and Turkey, for which the evidence of a stable relationship is weaker in that only one of the two financial indicators is cointegrated with real GDP per capita. This difference may reflect the fact that Chile, Mexico and Turkey experienced severe problems with their reforms, mainfested in financial fragility, which was much less so in South Korea, India and Greece (World Bank, 1989).

Tables 1B and 2B report results of long-run causality tests which are equivalent to weak exogeneity tests (Hall and Milne, 1994). These are causality tests between LDEPY and LGDP (Table 1B) and LPCY with LGDP (Table 2B), based on Johansen (1988)-type ECMs. The results of these tests are brought together in Table 3 from which an interesting picture emerges. This table summarises the causality results of twelve countries. In the case of Japan when both LDEPY and LPCY are utilised,

finance causes growth. In the cases of Greece (when LPCY is utilised), Spain and Chile (when LDEPY is used) as well as of India, Greece, Spain and Turkey, in all four countries when LPCY is used, finance follows growth. In the rest of the cases there is evidence of bi-directional causality.

Table 3 provides a summary of the results. The overall evidence on the developed economies provide support to the taxonomy suggested in section 2. Unidirectional causality running from finance to growth is found in Japan, while in Germany, UK, France and US causality is bi-directional. There is therefore some merit in the classification of financial systems as 'internally financed' with the exception of Japan which belongs to the 'bank-based' category, as argued in section 2.

The evidence on the other countries reflects the experience of these countries in relation to financial repression and liberalisation, the wider involvement of their governments in the economy and the effectiveness of economic policies in these countries, as well as the efficiency of their wider institutional arrangements.

We may commence our discussion with South Korea where bi-directionality is observed. Throughout the 1960s and 1970s preferential interest rates on loans and restrictions on non-bank financial companies were in existence, but subsidised credit was mild in the 1970s and essentially absent in the 1980s (Caprio et al, 1994). There was significant public ownership of banks throughout the 1960s and 1970s which was reduced by 1983. In fact, S. Korea is known to have been introducing reforms ever since the 1960s at a gradual pace and is usually regarded as a success story. The reforms were quickened in the 1980s when relaxing regulations of branching and management in the early 1980s took place, and transfer of ownership of banks to private sector was completed by 1983. Most preferential interest rates on loans were abolished by mid-82, and restrictions on non-bank financial companies eased. Selected interest rate controls were abandoned by 1991, but tacit intervention continued, and controls on international capital flows maintained during the 1980s. Under conditions of financial repression, and careful, indeed controlled, financial liberalisation, the finding that finance causes growth may be surprising. On the other hand this finding is consistent with the view that financial repression under conditions of good governance may be able to address market failure. These results are reinforced by Demetriades and Luintel (1996b) who find that in the case of S. Korea 'financial repression' had a positive impact on economic growth by increasing financial development.

The results on India show a weaker causal link from finance to growth in that only the deposits based indicators detects such a causal pattern. The credit indicator, on the other hand, suggests unidirectional causality from growth to finance. Our results are consistent with the view that in India poor governance did not help to address market failure. Such experience weakens the link from finance to growth, thus establishing the growth to finance result of Table 3. India went through an interesting experience

in terms of financial repression. In the 1960s lending rates were introduced and liquidity requirements were tightened. State development banks for industry and agriculture were founded along with comprehensive nationalisation in 1969 which was repeated in 1980. The powers of the Reserve Bank of India were thus enhanced substantially. Interest rate controls were rigidly applied from the 1970s to the late 1980s to all types of loans and deposits. In 1988, though, ceilings on lending rates began to be lifted and by 1990 both these and many concessionary lending rates had been abolished. Our findings on India and South Korea are also consistent with the results in Demetriades and Luintel (1996a, 1996b) where it is shown that in India the same type of financial policies as those implemented in South Korea worked very differently. Demetriades and Luintel interpret these results as indicating that 'the spirit of our conclusions may be encapsulated by the statement that market failure need not imply government success' (Demetriades and Luintel, 1996b, p. 15).

The results on Greece and Turkey, which suggest a weak causal link from finance to growth in the former and no such link in the latter, may also reflect the combination of financial repression with the absence of sound governance. Both countries were operating extensive regulations and financial controls for most of the period under scrutiny. Interest rates were administered alongside numerous credit rules and regulations. Capital markets in these countries were shallow over the period under investigation, especially equity markets due to lack of institutional investors, so that the private sector depended heavily on the state-administered banking sector for both short-term and long-term capital which led to mushrooming of extensive 'informal' markets for credit. Inevitably, the outcome of those institutional arrangements was the development of segmented financial markets. An important implication of those arrangements, and the credit rationing which ensued, was that the need for 'political resolution of conflicts' became paramount, thus leading to what Singh (1995) has labelled as 'crony capitalism' whereby finance favours individuals and families with 'political standing' rather than promoting long-term industrial growth. A further consideration is that their banking systems were constrained in their lending in view of the alarming incidence of non-performing loans which tended to grow as their service is capitalised into new loans. In Greece, non-performing loans to ailing industries amounted to several times the capital of the largest commercial banks. In Turkey, a financial crisis erupted in 1982 and five banks were rescued by the government at a cost equal to 2.5 per cent of GNP (World Bank, 1989). Moreover, as international banks infiltrated the local markets and captured the more credit-worthy customers, the position of the domestic banking system was weakened further (Branson, 1990, pp. 123-126; Katselis, 1990). These observations point to an important implication, that the relationship between finance and growth in these countries is likely to be weak, with the financial sector following rather than leading economic development.

These comments are also to some extent relevant in the case of Spain where banks play an important role in the financing of industry. Banks have been important shareholders as well as lenders to industrial firms. But the banking system in Spain is allegedly inefficient relatively to other European banking sectors (Vinals et al, 1990). Moreover, the Spanish banking system went through a period of financial distress in the seventies and early eighties. During this period fifty-one financial institutions, accounting for 20 per cent of total deposits, had to be rescued by the government; of these two were liquidated and the rest were sold to sound banks (World Bank, 1989). These observations may account to some extent for the lack of evidence supporting the finance causes growth proposition in the case of Spain.

Chile along with Mexico represent the Latin American experience in our study. In Chile banks were nationalised in 1971-73 only to be privatised in 1975-76. Prior to 1975 there had been substantial interest rate repression as this is evidenced by negative real interest rates for decades. In 1975 there was complete interest rate deregulation and privatisation of all banks by 1978, with reserve requirements reduced in 1974 and subsequently. Capital controls on nonbanks were lifted within 2 years, and on banks within 5 years. At the same time dramatic reforms of the real economy took place. Average tariffs were reduced from nearly 100 per cent in 1973 to below 30 per cent in 1976, and budget deficit eliminated by 1975, with large surplus by 1979. A period of financial crisis during 1981-83 ensued which was one of increasing domestic and external indebtness, high real interest rates, ultimately requiring massive bailouts of a large portion of the domestic banking system. In 1981, the Chilean government liquidated eight insolvent institutions which acounted for 35 per cent of the total assets of the financial system. In 1983, another eight institutions, representing 45 per cent of total assets, were taken over by the government: three of these were liquidated and the rest were restructured and recapitalised (World Bank, 1989). It is this experience in Chile, where financial repression prior to the 1980s and the crisis and eventual bailout of the banking sector in the 'liberalisation' environment of the 1980s, that is likely to be behind the 'growth causes finance' result. It is now widely recognised that inadequate bank supervision, which is clearly a symptom of unsatisfactory governance, contributed to this crisis. What is particularly interesting about this case is that a cointegrating relationship could only be gauged for the LDEPY variable, quite possibly because of the large percentage of total credit in the 1960s and 1970s going to the government.

Mexico's experience was rather different. Financial liberalisation began in the early 1980s partly because of the growing size of the unregulated financial sector (Warman and Thirwall, 1994, p. 634). Nominal interest rates were allowed to find their own level and real interest rates soon ceased to be negative. In fact since then, with the exception of 1983 and 1987, the real interest rate on bank deposits has been positive. By April 1989 the financial system was fully liberalised. Commercial banks

were nationalised in 1982 but re-privatised more recently (early 1990s). In spite of these frequent switches from nationalisation to privatisation of the commercial banks, the evidence shows that bank credit displays a stable long-run relationship with real GDP per capita. Moreover, the relationship is bi-directional, suggesting that Mexico's banking system played a positive role in the development process.

Conclusion

We have considered the question of causality between finance and growth in the case of twelve countries which have a number of different institutional characteristics, policies and degrees of governance. The results in all cases tend to justify our claim for the importance of institutional considerations, policy differences and the quality of non-financial institutions. In the developed economies, financial structure has an important bearing on the direction of causality between finance and growth. The results on Japan, which arguably has a 'bank-based' system, show unidirectional causality from finace to growth. In the UK, US, Germany and France we find bi-directionality, which is consistent with the 'internally financed' view. The results on the other countries largely reflect their experiences with financial repression and liberalisation and the extent to which government interventions enhanced or reduced the effectiveness of their financial systems. Thus, in South Korea, which is well known case of successful government intervention in the financial system (e.g World Bank, 1993), we find clear evidence of a bi-directional link between finance and growth. In Turkey and Chile, countries which experienced severe problems with their financial reforms, as a result of unsuccessful government policies and bank supervision failures, the link between finance and growth appears weak and runs from growth to finance. In Greece and India, countries which experienced financial repression and, which, however, did not suffer as much as Turkey and Chile from financial fragility, there is some evidence of a bi-directionality. There are finally the cases of Mexico and Spain which are also consistent with the overall picture of varying causal patterns as a result of institutional and policy differences.

To conclude on an optimistic note, there is evidence to suggest that financial systems *can* promote growth. The extent to which they are able to do so, however, may depend on country specific institutional factors relating to the structure of the financial system and, also, the quality of non-financial institutions. Our results are also indicative of the likely importance of good governance in that its presence or absence can make the difference between the financial system promoting or following growth. Further empirical research on this issue is, therefore, likely to be very fruitful.

NOTES

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[1] The globalisation of financial markets may have also influenced the link between finance and growth. Central Banks are no longer as powerful as they used to be. The power of financial markets has increased substantially, so that their influence overrides even electoral mandates (Woodward, 1994, p. 91). The ability of highly innovative financial markets to lower the costs of intermediation and circumvent regulations that impede profitable transactions, has been enhanced substantially. Furthermore, financial fragility may have increased which has weakened the transmission mechanism from policy instruments to policy targets and the link of finance to growth. Causality between finance and growth may very well have been affected.

[2] Japan has also gone through changes which, however, are significantly less dramatic than the changes other countries have experienced as discussed in the text. Internal finance increased in the late 1970s and some minor shifts from bank finance to market sources were vastly exaggerated by Japanese commentators. The share of internal finance in Japan is the lowest in the industrialised world but at the same time that of external finance is the highest (Corbett and Jenkinson, 1994).

[3] Germany is an interesting case in that a growing literature questions whether the system there resembles the Japanese. Edwards and Fischer (1994) have suggested that in the 1970s and 1980s German firms relied less on bank loans as a source of finance than, for example, did UK firms. They have also questioned the proposition that the involvement of German banks in industry is as strong as it is usually claimed. Others have propounded the view that the influence of the German banks on the economy has been overestimated (Schneider-Lenne, 1994), although roughly two-thirds of bank loans to industry in Germany are long-term (op. cit., p. 293).

[4] The time profiles were as follows: France (1953-1991), Germany (1961-1991), UK (1952-1991), Japan (1955-1992), US (1949-1991), S. Korea (1954-1992), India (1961-1991), Greece (1954-1991), Spain (1957-1992), Turkey (1957-1990), Mexico (1951-1992) and Chile (1964-1992).

[5] In view of space constraints these results are not reported here. They are available from the authors upon request. All the econometric of the paper were carried out using PC-GIVE and PC-FIML.

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TABLE 1A

COINTEGRATION TESTS

(H_0: r = 0, H_1: r = 1)

LDEPY/LGDP

	MAXIMAL EIGENVALUE			TRACE STATISTIC		
COUNTRY	k = 2	k = 3	k = 4	k = 2	k = 3	k = 4
FRANCE	15.21	13.39	18.09	18.37	16.70	24.82
GERMANY	13.50	13.06	14.27	23.72	23.39	22.28
UK	14.01	8.56	10.22	21.66	16.04	17.19
JAPAN	12.69	10.50	15.25*	18.24	13.36	16.71*
US	14.22	9.91	8.02	21.50	15.09	10.56
S. KOREA	14.69*	13.50	9.00	14.72	13.94	9.12
INDIA	5.51	3.64	14.56*	6.51	4.64	15.80*
GREECE	14.97	19.80*	20.65*[a]	21.70	27.55*	20.76*[a]
SPAIN	15.95	18.67	19.55*	17.88	23.87	25.05
TURKEY	10.61	9.39	9.48	14.52	15.32	14.32
MEXICO	9.49	9.87	10.77	14.07	16.44	14.89
CHILE	25.97**	10.99	9.72	30.35*	13.72	13.83

NOTES:

One asterisk denotes statistical significance at the 5 per cent level and two asterisks indicate statistical significance at the 1 per cent level.

k = number of lags in VAR.

[a] For this cointegration test k = 5. This was necessary since only for k = 5 were no serial correlation and no heteroscedasticity evident.

TABLE 1B

CAUSALITY TESTS (WEAK EXOGENEITY TESTS)

(CAUSALITY TESTS BETWEEN LDEPY AND LGDP)

VARIABLE →	LDEPY (H_0 : VARIABLE IS WEAKLY EXOGENOUS)			LGDP (H_0: VARIABLE IS WEAKLY EXOGENOUS)		
COUNTRY ↓	k = 2	k = 3	k = 4	k = 2	k = 3	k = 4
FRANCE	-	-	-	-	-	-
GERMANY	-	-	-	-	-	-
UK	-	-	-	-	-	-
JAPAN	-	-	0.33	-	-	13.72**
US	-	-	-	-	-	-
S. KOREA	4.26*	-	-	11.56**	-	-
INDIA	-	-	3.91*	-	-	9.33**
GREECE	-	11.19**	6.74**	-	0.18	17.82**
SPAIN	-	-	14.05*	-	-	0.06
TURKEY	-	-	-	-	-	-
MEXICO	-	-	-	-	-	-
CHILE	19.04**	-	-	1.37	-	-

NOTES:

As in Table 1A

TABLE 2A

COINTEGRATION TESTS

(H_0: r = o ; H_1: r=1)

LPCY/LGDP

	Maximal Eigenvalue			Trace		
COUNTRY	k = 2	k = 3	k = 4	k = 2	k = 3	k = 4
FRANCE	16.06	14.96	19.06*	20.17	19.93	25.58*
GERMANY	16.10**	16.21**	11.56*	18.26**	16.22*	11.69
UK	13.86*	16.12**	10.24	15.02*	17.18**	11.39
JAPAN	-[b]	14.74*	13.56	-[b]	15.88*	13.57
US	14.61*	11.40	13.25*	15.55**	13.37*	18.28**
S.KOREA	16.39*	-[b]	9.40	16.40*	-[b]	9.48
INDIA	16.09	-[b]	27.53**	20.30	-[b]	33.96**
GREECE	-[b]	31.58**	21.90*	-[b]	35.78**	25.59*
SPAIN	13.11	19.33*	18.46	16.06	24.60	23.83
TURKEY	16.66*	16.31*	24.45**	17.06*	16.66*	25.81**
MEXICO	6.82	6.83	30.51**[c]	8.59	9.06	37.27**[c]
CHILE	10.20	8.88	10.43	13.23	11.61	14.30

Notes:

One asterisk denotes statistical significance at the 5 per cent level and two asterisks indicate statistical significance at the 1 per cent level.

k = number of lags in VAR.

[b] The values here are not reported because they fail the serial correlation and heteroscedasticity tests.

[c] For this cointegration test k = 5. This was necessary since only for k = 5 were no serial correlation and no heteroscedasticity evident.

TABLE 2B

CAUSALITY TESTS (WEAK EXOGENEITY TESTS)

(CAUSALITY BETWEEN LPC AND LGDP)

VARIABLE →	LPCY (H_0: VARIABLE IS WEAKLY EXOGENOUS)			LGDP (H_0: VARIABLE IS WEAKLY EXOGENOUS)		
COUNTRY ↓	k = 2	k = 3	k = 4	k = 2	k = 3	k = 4
FRANCE	-	-	6.54*	-	-	6.78**
GERMANY	7.43**	4.73*	1.56	16.67**	12.33**	9.98**
UK	1.32	3.96*	-	12.70**	14.33**	-
JAPAN	-	0.85	-	-	13.16*	-
US	9.66**	7.14**	7.50**	8.12**	4.96*	2.88
S.KOREA	4.83*	-	-	11.93**	-	-
INDIA	-	-	17.54**	-	-	0.46
GREECE	-	24.37**	18.01**	-	2.30	0.76
SPAIN	-	13.97**	-	-	0.42	-
TURKEY	15.57**	13.99**	19.98**	0.34	0.00	0.06
MEXICO	-	-	3.86*	-	-	18.79**
CHILE	-	-	-	-	-	-

Notes:

As in Table 2A

TABLE 3

SUMMARY OF RESULTS

COINTEGRATION AND CAUSALITY TESTS

COUNTRY	COINTEGRATION		FINANCE CAUSES GROWTH		GROWTH CAUSES FINANCE	
	LDEPY	LPC	LDEPY	LPCY	LDEPY	LPCY
FRANCE	NO	YES	-	YES	-	YES
GERMANY	NO	YES	-	YES	-	YES
UK	NO	YES	-	YES	-	YES
JAPAN	YES	YES	YES	YES	NO	NO
US	NO	YES	-	YES	-	YES
S. KOREA	YES	YES	YES	YES	YES	YES
INDIA	YES	YES	YES	NO	YES	YES
GREECE	YES	YES	YES	NO	YES	YES
SPAIN	YES	YES	NO	NO	YES	YES
TURKEY	NO	YES	-	NO	-	YES
MEXICO	NO	YES	-	YES	-	YES
CHILE	YES	NO	NO	-	YES	-