FINANCIAL DEVELOPMENT, GROWTH AND POVERTY: HOW CLOSE ARE THE LINKS?

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Abstract

The causal link between finance and growth is one of the most striking empirical macroeconomic relationships uncovered in the past decade. As this branch of the literature matures, the focus shifts from growth to other aspects of economic prosperity and from financial depth to multidimensional measures of financial development. This paper reviews the evolution of the literature and contributes by (i) showing that financial depth is negatively associated with headcount poverty, even after taking account of mean income and inequality; (ii) illustrating the pitfalls in equating financial development with financial depth and (iii) proposing alternative measures of financial development that, though summary, capture its multidimensional nature.

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1. Introduction and summary

Among the most striking empirical macroeconomic relationships uncovered in the past decade is the apparently causal link between financial development and economic growth. This paper begins (Section 2) with a brief account of the key methodological elements underlying this discovery.

A second generation of empirical cross-country models recognized that, while financial depth and average GDP growth represent useful starting points for the measurement of cause and effect (input and output), neither is comprehensive or fully satisfactory.

On the *output* side, while average growth rates remain by far the most studied, there has also been more emphasis on the quality of growth in terms not only of volatility, but also income distribution, both of which are crucial to sustainability. Section 3 contributes to this emphasis presenting new evidence on the question of whether finance-intensive growth is pro-poor: we find that financial depth is negatively correlated with headcount poverty rates, even after taking account of the mean income and the share going to the top income groups.

Regarding the *input* side, financial depth remains central in empirical analysis despite its severe shortcomings whether as a cross-country or time series measure of financial development. Section 4 illustrates these shortcomings in a brief examination of four contrasting country cases (China, Korea, Russia and the United Kingdom). Recognizing these difficulties, second generation research has widened the focus on the input side to include *structural* characteristics of finance, such as the relative importance of banks and securities markets and *infrastructural and institutional* prerequisites, such as the legal and informational environment as well as the regulatory style. Use of data on these dimensions has allowed a richer interpretation of the processes by which financial development impacts wider economic conditions. Section 5 suggests drawing on some of these second generation findings to construct a more comprehensive composite indicator of financial development, using complementary institutional characteristics.

2. The scale of banking and the rate of growth

Of course rich countries have big banking systems, but whoever thought it was a causal link? Until about 10 years ago, most of those working in money and banking believed that monetary policy was only good for preserving stability. Using money to drive growth was like pushing on a string.

True, there was a 1970s "money and growth" literature which argued essentially that by manipulating the rate of inflation the government could correct an underinvesting economy by inducing a change in the private savings ratio. But that was an era in which it was somewhat less than respectable for economists to think that economic policy could alter economic *growth rates* on a sustained basis. Once full employment was achieved, all that could be hoped for was for growth in productivity to augment labour growth. A higher propensity to save out of income would result in a more capital-rich economy, but

one which, with diminishing marginal returns to capital, would eventually settle down at the same growth rate as before – driven by productivity. And productivity was not something that most economists felt comfortable talking about.

Instead of seeking to manipulate long-term growth rates, students of growth theory in that era were concerned instead to design policy that would ensure that the economy would select the long-term equilibrium growth path with the appropriate level of capital – not overinvesting (like Soviet Russia), and not underinvesting (like, perhaps, Britain in those days). Here's where that manipulative use of money through the inflation tax, to ensure sufficient saving, could come in.

But for most purposes, money and finance were seen as something that could go wrong, plunging the economy into a disequilibrium of involuntary unemployment as had occurred in the 1930s, and seemed to be re-emerging in the 1970s with the collapse of the Bretton Woods system and the oil crises. Avoiding crises seemed to be the main task of financial policy.

What changed? It is an interesting vignette of intellectual history. First, as more and more data accumulated on national economic growth rates across the world, it became evident that there were large and sustained differences in average growth rates between different countries. This tended to cast some doubt on the usefulness of models that had nothing to say about what might explain such differences. Then theoretical advances emphasizing increasing returns to scale and spillovers from investment in education and technology brought it home to economists that their analytical tools could be useful in analyzing market behavior that could influence the rate of growth of economies on a permanent basis. The intellectual liberation resulting from these theoretical advances -- and the availability of cross-country data -- unleashed a tidal wave of international cross-sectional growth regressions (for a survey see Easterly 2001). Each researcher had his or her favorite explanatory variables, many of them mutually correlated, and each (if advanced on its own) seeming to provide considerable explanatory power. But the theories couldn't all be right.

In an important contribution Levine and Renelt (1992) showed that the data could not discriminate between most of the alternatives. The volume of investment and the level of education provision seemed to be the about the only economic variables robust to the inclusion of alternative candidates. Not that the other variables were necessarily irrelevant, but they were too closely correlated among each other to be able to tell which was the driving force and which was merely tagging along. A researcher coming with a strong prior belief about any of some two dozen causal variables could find confirmation in the data, but what such a researcher could not do was refute an opponent who believed that another of the collection of supposed causal variables was instead the truly significant one. Levine and Renelt seemed to put paid to the prospect that a robust causal variable would be found.

Then, unexpectedly, from the apparent wreckage of most cross-country growth studies, a neglected variable bubbled to the surface. Almost uniquely, financial depth, when tested

in the same way, proved to survive. The discovery was made by King and Levine (1993). Overnight, the finance and growth literature was relaunched along an entirely new dimension.

The subsequent literature has been a large one, which I will not attempt to review here. For me its conclusions are summarized in two charts. The first one I call "*post hoc ergo propter hoc*", because, in itself, its force is no stronger than that. Nevertheless, it is suggestive that the mean GDP growth rate over the next 40 years of country groups sorted by financial depth is so clearly ranked (Fig. 1). King and Levine's 1993 papers of course went well beyond that. One of their main goals, as mentioned, was to show that this correlation survived the process of controlling for other candidate variables for explaining growth.[1] And it does, whether we look at contemporaneous or initial (1960) data on financial depth.

The other chart (Figure 2) draws on a later paper by Levine, with Loayza and Beck (2000), which is my favorite from this literature, because of the persuasive way it deals with another problem: that of reverse causality (endogeneity). After all, perhaps *post hoc ergo propter hoc* is not enough (especially if we look at shorter periods than 30 years). Perhaps persistently rapid-growth countries call forth deeper financial systems: if so, then observing a deep financial system in such a country may not be telling us anything about the power of finance to generate growth. The standard way of dealing with this problem in econometrics requires the use of instrumental variables, i.e. variables correlated with financial depth, but not otherwise linked to GDP growth. Employing, in the causal regressions, the predicted value of a country's financial depth from a regression using such instruments removes the potential reverse causality bias. Finding valid and strong instrumental variables is easier said than done, but LLB employ a recently discovered fact, namely that countries which have inherited variants of English common law tend to have deeper financial systems than those whose legal inheritance is from the Napoleonic code or the distinct German and Scandinavian traditions that are recognized. These legal origins date so far back as to exclude the possibility of feedback from recent growth processes, which helps ensure that they are valid instruments.[2]

Figure 2 shows the scatter of financial depth and growth rates in the LLB sample. Two lines are plotted. One is drawn by me as a naïve simple regression, and as such potentially contaminated not only by reverse causality, but by the omission of other causal factors. The other line, marked "model" is the projection of the multivariate relationship estimated by LLB. I learn two striking facts from this figure. First, the relationship is not a very close one: much of the variation in growth is due to other causes. And if a country moved from the lowest decile of financial depth (13%) to the highest (75%) it could expect to improve its growth rate by a lot (over 4 percent in this model) all other things being equal, but there are pairs of countries with a smaller

[1] Such as initial income level, education, government spending, inflation, trade openness, measures of political liberties and law and order.

[2] A third requirement for validity, that the instruments have no independent causal effect on GDP growth, is not easily tested. The well-known over-identification tests do not fully test this, contrary to what many authors seem to believe.

financial depth difference (30 percentage points) but a growth difference more than twice as great. Second, the modeled impact of finance on growth is much stronger than the naïve regression would have indicated. That is to say, the combined effect of reverse causality and omitted variables bias is to mask rather than to exaggerate the effect.[3]

3. Not mainly for the rich

Aggregate economic growth is, of course, the key to economic prosperity of rich and poor alike, and the finding that financial development contributes to it must be inform policy that seeks to achieve a reduction in global poverty.

Yet for some observers emphasizing finance seems to be getting the wrong end of the stick. Noting such characteristics as the high salaries paid on average in the financial sector, these observers suppose that if the financial sector prospers, this may mean a deterioration in the distribution of income: more for well-paid investment bankers, not much for their drivers or cleaners. Rajan and Zingales (2003) cite Tom Wolfe's novel *The Bonfire of the Vanities* as illustrative of the widely held view that finance benefits only, or mainly, the rich. If this casual prejudice was borne out in reality then one would become somewhat ambivalent about relying on financial development as a priority instrument for tackling poverty in developing economies.

But, as Rajan and Zingales note, a healthy financial system can be a powerful anti-monopoly tool, providing the lubrication for the emergence of competitors that can undermine the power of incumbent firms, and the means for poor households and small-scale producers to escape the tyranny of exploitative middlemen. In contrast, the undeveloped financial system, in their words, can be "clubby, uncompetitive and conservative". If so, financial development *could* be pro-poor. But is it?

To be sure, financial development promotes growth, and we have extensive evidence that growth worldwide has been a powerful mechanism for reducing poverty. Furthermore, the lowest quintile shares in the national rate of growth. To use the terminology of fiscal policy, growth is neither progressive nor regressive: it is – on average – neutral (Dollar-Kraay 2002). That means that the rich get more dollars from every increment of growth than do the poor, and that no improvement can be expected in relative poverty from the growth process *per se*, but it also means that absolute poverty declines.

But the Dollar-Kraay results do not amount to saying that "a rising tide raises all boats." The tidal analogy is quite imperfect. Of the many drivers of growth it could still be that financial development is regressive. This indeed is the prediction of the widely cited model of Greenwood and Jovanovic (1990). They argue that getting involved in the

[3] The finance-growth relationship continues to be studied, and even challenged, as in, for example, Favar (2003), who fails to find significant coefficients on finance in instrumented growth regressions. At bottom the main problem is typically one of weak instruments: OLS estimates still indicating causality. Such negative findings are not sufficient to revise the main-line view that finance causes economic development based, as it is, not only on the studies cited but on a wide range of cross-country studies, including those based on firm-level, industry-level and state-level evidence (see World Bank, 2001, and the papers cited therein).

financial sector and benefiting from the screening and risk pooling that it offers requires an initial set-up cost (either of participating in the group that establishes financial infrastructure, or eventually paying an access charge to those who have done so). Poor households will not be in a position to incur this cost, and will not find it worthwhile even to set aside savings for this outlay, hence falling even further behind in the distribution of wealth.

The regressiveness prediction of Greenwood and Jovanovic has not been borne out in the empirical literature. Specifically, Li, Squire and Zou (1997) find that financial depth entered strongly and significantly as a contributor to lower inequality (Gini index) and raise the average income of the lower 80% of the population.[4] The reasoning suggested by Li, Squire and Zou is that better financial development should alleviate credit constraints for poorer households, allowing them to make productive investments, for example in human capital. (They also note that the household Gini for wealth index in the past should also predict inequality of investment – though in that case it is perhaps easy to think of multiple paths through which past wealth inequality persists in predicting current income inequality.)

Inequality and poverty incidence are not, of course, the same thing, especially if we measure poverty in absolute terms, such as the share of the population earning less than $1 a day. Nor does analysis of the growth of the average income of the bottom quintile directly address the impact of financial development on poverty. Indeed, there appears to have been comparatively little reported empirical cross-country research on the possible impact of financial development on absolute poverty ratios.

Apparent gaps in the empirical literature often reflect the absence of significant and robust empirical relationships. Yet, in this case, there are already intriguing indications from cross-country evidence that finance may be surprisingly effective in reducing poverty.

One contribution employing indirect but highly suggestive evidence suggesting a pro-poor dimension to finance-rich growth comes from Dehejia and Gatti (2002), who study child labor, well-known to be a correlate of poverty.[5] Using a panel of countries at five or 10-year intervals, and controlling for the level of GDP per capita and other expected causes, they find that the incidence of child labor seems to be affected on a cross-country basis by the degree of financial depth. That this might reflect the enhanced ability of deep financial sectors to insulate poor households from shocks is further suggested by the fact that the impact of national income volatility on child labor is insignificant if analysis is confined to countries with deep financial systems.

The problems of reverse causality that plague the empirical analysis of the causal role of finance and growth may be less severe when it comes to exploring a causal role for finance in poverty. After all, only a small fraction of aggregate financial assets are held

[4] The first result is subjected to more robustness tests than the second, where the financial depth variable is correlated with other variables measuring overall development or per capita income.
[5] Though some research suggests that it may not reduce schooling by as much as is often thought.

by the poor, so poverty rates are very unlikely to influence financial depth in a significant manner. Anyway, although it is rarely possible to exclude the possibility of reverse causality altogether, we will proceed on the basis that assuming its absence is likely to be better than working with weak instruments.

Thus, the way is open to a fairly straightforward approach to seeing if there might be a possible causal link. Accordingly, drawing on a cross-section of some 70-odd developing countries[6] for which poverty data are available, we now show that a striking empirical relationship seems to emerge: deep financial systems appear to be associated with lower poverty.

The major determinant of variations in poverty incidence across developing countries is, not surprisingly, the mean level of GDP per capita: an unevenly-divided small cake leaves more people hungry than a large one. As shown in Equation A of Table 1, this variable alone explains 47 per cent of cross-country variation in absolute poverty (share of population below $1 a day). The point estimate implies that a 10 percent increase in mean per capita income translates into a 1.6 percentage point reduction in absolute poverty. Naturally, the way in which this income is distributed also matters: for example, calculating the mean income of the bottom 90% of the population (by subtracting the income earned by the top 10% income earners) greatly improves the fit – the RSQ now is 54% (Equation B). Interestingly, the income share of the top 10% also contributes to explaining cross-country poverty variance (likely because it also predicts a higher share for the *non*-poor that are in the lower 90%).[7] Anyway with this addition, the RSQ is up to 58% (Equation C).

Now it's time to add in the financial variables. Starting with the standard non-government ("private") credit variable. Here we prefer to exclude three countries which are outliers in a cross-country regression of credit on inflation and per capita GDP – their data for non-government credit are more than three standard errors away from the regression line.[8] One is Panama, an offshore center, the other two are Thailand and China. (We will return to China below, observing that most Chinese "non-government" credit is to state-owned or controlled firms.) With the remaining data, a striking negative coefficient is observed in the regression explaining poverty (Equation D). The additional variable improves the fit to 64%. Taken literally – and we should not do this except as a rough indication of the size of the effect – the estimates imply that a 10 percentage point in the ratio of private credit to GDP should (even at the same mean income level) reduce poverty ratios by 2.5 to 3 percentage points.

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[6] Note that the finance and growth studies typically study both rich and poor countries. Poverty shares in the advanced countries are all measured at essentially zero for these international cut-off lines of $1 and $2 a day.

[7] Though the Gini coefficient does not enter significantly. Alternative specifications using the share of the top 20%, or the bottom 10 or 20 percent, are inferior in fit. Results from including alternative aspects of the distribution as explanatory variables are reported in Table 6. The link between income inequality and poverty is also discussed in Besley and Burgess (2003), though by looking at standard deviation of log income (rather than, as here, the top decile share) their estimates are influenced by the mechanical partial induced between inequality and absolute poverty by conditioning on mean income.

[8] Results for the full sample are reported as Table 1 (Alternate).

This finding suggests that the theories that argue that financial development can help the poor may have some bite. The balance-sheet size of even a well-developed banking system will be adversely affected by inflation, as is repeatedly confirmed in the literature. Allowing for this either by including inflation as an additional regressor, or by substituting the residual in a regression of credit on per capita GDP and inflation[9], takes account of this. In both cases credit remains highly significant (Equations E and F, Table 1).

Political-institutional characteristics can affect financial development as they can affect other aspects of economic conditions. As a robustness check we included each of the omnibus governance variables included in the World Bank's database (Kaufman, Kraay and Zoido-Lobatón, KKZ 1999; Kaufman, Kraay and Mastruzzi 2003) as additional regressors. None were significant at the 95% level, and the credit variable retained its significance (Equations A-E, Table 2). An alternative way of attempting to ensure that hidden politico-institutional characteristics are not biasing the results is to include regional intercept dummies. Although these are collectively significant, they do not much alter the size or significance of the main variables (Equation F, Table 2).

(Using the higher poverty threshold of $2 a day gives broadly similar results, though not quite as strong an effect of credit; see Tables 3 and 4).

So much for the banking dimension to finance. How about capital markets? Their development has been shown to be equally important for growth. Do they also contribute to a greater lowering of poverty than implied by their effect on growth? The answer is that apparently they do not. Adding stock market capitalization and or market turnover to the basic equation does not significantly alter fit or the other coefficients and the new variables are not significant. Nor does bank concentration appear to be a significant contributor (Table 5).[10]

The empirical correlation which we have detected is suggestive, rather than conclusive evidence that emphasizing financial development is benign in regard to poverty in that it is more likely to reduce poverty than the average pro-growth initiative. But the analysis is at too aggregate a level to be fully convincing. Additionally, the ways in which financial development is being measured, based mainly on size, are clearly rather weak ones.

4. The pitfalls in measuring financial development with banking depth – country cases

The focus so far here, as in much of the early literature, has been on banking depth as the main measure of financial development. But when one considers the likely channels through which a more developed financial system likely helps promote growth and reduce poverty, it becomes evident that, though useful and readily available, banking depth is unlikely to be a wholly reliable summary indicator. Indeed, financial

[9] This auxiliary regression is reported in Table 7.
[10] Once again the $2 a day threshold gives similar results (not shown).

development itself is a proxy for what we really are interested in, which is some measure of the quantity and quality of financial services that households, firms, and governments received in total (as well as which part of this they get from domestic financial service providers – the decline in this share is likely to attenuate the link between domestic finance and growth).

Current theories about these channels of effect emphasize four key functions of finance are central: mobilizing savings (thereby creating concentrations of capital that allow exploitation of economies of scale); allocating capital (helping judge where returns are most likely to be obtained); monitoring the use of loanable funds by entrepreneurs; and transforming risk by pooling and repackaging it (cf. Levine 1997). When put this way, it becomes less surprising that legal structures may have a role in determining the scale and the efficiency of finance (making them so useful as econometric instruments), given that the intertemporal contracts that underlie each of these functions need to be actively supported by a legal and judicial system. Regulatory and information infrastructures in the economy may also evidently be important. Also, it becomes evident that summarizing the development of a financial system by a single measure of the scale of its banking is not likely to fully capture variations in the degree and effectiveness with which it performs these functions. Nor has the literature neglected these points.

Thus, if we are to speak of financial development contributing to growth, the concept of development we have in mind must be far more subtle and complex than simply size. Indeed size measures can be quite misleading in a number of ways which will now be illustrated by reference to several specific country experiences.

China

Among large countries, China has the deepest banking system of all (bar a few places like Luxembourg, which are important offshore centers and the scale of whose banking system is based on the export of financial services). The ratio of China's bank deposits to GDP is still rapidly growing – the M2 to GDP ratio now exceeds 170%. And we know that China's economy has been growing very rapidly for the past couple of decades. Yet China's banking system does not normally receive accolades for having importantly contributed to this rate of growth. Instead, commentators like Lardy (1998) point to the quasi-fiscal use of China's banking system as a means of keeping afloat state-controlled enterprises: at a time when rapid liberalization of the Chinese economic system had left many enterprises—no longer able to function profitably on the basis policy-influenced relative prices that were far from those of the world economy—high and dry. China's state-controlled banks – and that accounts (one way or another) for more 95 percent of the system, had responded by advancing the needed funds to these enterprises on the basis of public interest. These were not the engines of growth – though it could be argued that keeping them going offered a degree of political and social insulation to the process of adjustment to a more coherent set of market prices that *was* an essential prerequisite of growth. As a result of this practice, non-performing loans at the Chinese banks rose very rapidly in the late 1990s and the government has already had to make special provisions to ease the burden on the banks.

China is, of course, a vast country of contrasting economic structures. Provincial level data exploiting this variation offer another opportunity for applied econometricians to test their favorite theories. In a recent working paper Genevieve Boyreau-Debray (2003) examines the banking-depth and growth relationship across 26 Chinese provinces. Interestingly, and perhaps not surprisingly, she finds the opposite relationship to that found in cross-country studies. The provinces with the greatest banking depth are the provinces that have been growing more slowly (Figure 3). (Boyreau-Debray does examine some other aspects of the financial environment: greater diversity in provincial finance does seem to help growth for example.)[11]

The Chinese case not only raises the question of measurement: it also confronts us with the challenge of explaining just why China can have done so very well in terms of growth this past quarter century with a financial system that, though deep, has not been performing the theoreticians' functions of a market-driven financial system to any considerable extent. Undoubtedly, there is a financial dimension here, namely the scale of investible resources: if the Chinese savings ratio averaged over 35 percent for two decades, these savings have certainly built up the stock of capital in China. Just as with other East Asian miracles, I think it's fair to say Chinese growth can be largely attributed to the accumulation of capital and the successful shift in the application of available labor away from subsistence agriculture to higher productivity activities using this capital.

This helps us understand better how to view the role of finance in growth. You can get a long way *without* a state of the art financial system. Even if available savings are not allocated to the most effective enterprises, the sheer volume of capital accumulation (even if not the most appropriate or best-judged design), combined with the huge productivity gain from shifting workers from subsistence agriculture to the modern economy allows very rapid growth. At the same time, for all the rapid growth that China has had, it is still not at the global production frontier. Per capita income is still less than $1,000 measured at market prices, and less than $5,000 measured at purchasing power parities.[12] Even the higher figure puts it into the same class (only) as Eritrea, Macedonia, Algeria or Peru. Still a long way to go to match Korea, say (with its PPP per capita income at $18,000): it will need a better financial system to get to the frontier.

Russia

A more dramatic example of the way in which banking depth can be misleading comes from the former Soviet Union countries, where deposit growth through the 1980s left them with deep banking systems as it appeared. The ratio of M2 to GDP in Russia in 1990 was 81%. But here the holding of bank deposits was distorted by a number of features, including the widespread rationing (why spend your bank deposits if there is nothing to buy). Indeed, the true value of bank deposits was much lower in that price controls held prices of consumer goods far below their market-clearing values. If valued at market-clearing prices, aggregate bank deposits were much smaller, and (though

[11] Most of the international (cross-country) studies exclude the Chinese data for one stated reason or another.

[12] The PPP measure is better for judging living standards; perhaps less good for assessing convergence to international levels of productivity.

output figures were also somewhat flattered by the artificial prices) the true money to GDP ratio was surely much smaller. In the event, rapid inflation fueled by the printing press following price liberalization soon made the initial stock of bank deposits in Russia almost worthless. Russians were slow to return to trusting their banking system, which remained small, and collapsed again in the exchange rate and debt default crisis of 1998. Even today, the Russian banking system does very little of the classic activities for which the theoreticians would have us look. A decade after the collapse of the old system, by end-2000, the M2/GDP ratio had recovered, but only to 22%. Three-quarters of household deposits are with the state-owned Sberbank, which accounts for over a quarter of the total banking system and still lends more than half of its resources to the state. It is evident that Russia did not have what we would regard as a developed financial system when it had a high M2/GDP ratio and it does not have one now.

A feature common to Russia and China is that much of the banking resources were being lent to the public sector either as part of a plan (pre-reform Russia)[13] or in a vestigial survival of plan-type allocation. The use, by econometricians like Levine, of lending to the private sector as a better measure than simply M2 or total credit is one way of getting around this problem.

Britain and Korea

One further dimension must be mentioned to complete the catalog of shortcomings of monetary aggregates as measures of financial development. Let me do this by way of two examples: the United Kingdom and Korea. In deference to our hosts today, I will begin with the British data. Figure 4 shows a time series of money (wide money as measured in *International Financial Statistics*) and bank credit to the private sector each deflated by GDP. The series end in 1980 because of a major change in data definitions that year; but the series is long enough to show some interesting and, to observers of UK monetary policy, well-known features. The first of these is the declining monetary depth throughout the 1950s.[14] High monetary depth was clearly not a sufficient condition for sustaining rapid growth in the Britain in the 1950s. On the other hand, the share of private credit in GDP does start to grow fairly steadily from 1958 on and this coincides with a period of higher average GDP growth in the 1960s; but before we get too excited about a possible correlation look what happens at the beginning of the 1970s: a huge credit boom followed by a crash. Of course the crash is mainly related to the first oil crisis, but somewhat exacerbated by the collapse of a property bubble that had been fuelled by credit.[15] This experience points to a myriad of other considerations that need to be brought into the picture in any particular instance, and especially over the short- to medium-term, to determine the relation between financial aggregates and growth; microeconomic policies on credit; wider macroeconomic stabilization issues; and business cycle effects.

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[13] Even if lending is to the private sector, heavy involvement of the state in allocating this credit can have much the same effect as if credit was simply going to the state. This is the underlying rationale for the use by some researchers of the ratio of central bank assets to total banking assets as a supplementary banking indicator of financial development.

[14] Essentially this was the working off of an inherited over-liquid situation created by war-time borrowing. The problem was addressed by the famous Radcliffe Report of 1958.

[15] The credit boom had been unleashed be a relaxation of quantitative credit controls.

The case of Korea reinforces these points, especially in regard to the vulnerabilities that can be created by the high leverage and weakened creditworthiness associated with credit booms. The Korean experience of the 1960s and 1970s could be seen as – and I think are – part of the positive feedback interaction between monetary deepening and a strengthening of the economic structure. But if we look at the last 20 years, the Korean data seems to show a negative association between banking depth and growth. This is especially so if we take the conventional base of the core banks – the so-called deposit money bank of *International Financial Statistics*. Here the rapid acceleration in monetary depth of the late 1990s seems to coincide with the collapse in growth rates. But such a sharp break in trend as we see at 1996-97 alerts the applied economist to the likelihood that something else is happening in the background that (even if there is no change in the statistical definitions used to construct the series – and there is none here) alters the interpretation or representativeness of the series. Indeed, something was going on and – interestingly it was a phenomenon which confused Korean policy-makers at the time, pulling some statistical wool over their eyes and blinding them to an impending disaster. As is explained by Cho (2001), Korean financial institutions and their customers, maneuvering around both macroeconomic policy (including monetary targets) and prudential controls, began to employ forms of credit which were off the balance sheets of the commercial banks. Monetary aggregates – based on the balance sheets of the banks – were reassuringly stable, and prudential warning bells remained silent even as rapid increases in corporate leverage, especially short-term indebtedness, heightened the vulnerability of the entire economy. Adding back in the credit issued by near-banks[16] shows the true evolution of credit in Korea: a steady and rapid rate of increase until the crisis. The effect of the adjustment is to reinforce the appearance: rapid credit growth precedes a crisis. And this is, of course, a fairly universal observation (Honohan 1997; Demirgüç-Kunt and Detragiache 2001, etc.).

Another message of the Korean and UK experience is the increasing slipperiness of the data as the financial sector increases in complexity and scale. We saw how crucial the dividing line between commercial banks and near-banks was for interpreting the scale of Korean intermediation. Rolling forward the UK data reveals several huge changes in the measured aggregates (both increases and decreases) as statistical conventions were revised over the years from 1980 to try to keep appropriate track of financial innovations. Between 1986 and 1987, the definition of bank deposits was revised, bringing the measured ratio in *IFS* of M2 (money plus quasi-money) to GDP from 46.8% in 1986 to 80.5% the following year. How can cross-country comparisons be relied upon if even within a country two acceptable definitions of monetary depth can be so widely differing for consecutive years. As a rule of thumb, I suggest that any country which has a monetary depth of 100% has already satisfied the minimum scale criterion for having reached the frontier in financial development: a necessary condition, but not a sufficient one.

[16] The "Other Banking Instititutions" of *International Financial Statistics*. There may be a slight overstatement here in that some bank credit received by nonbank financial institutions is double-counted; but this is small.

So, in summary, several drawbacks have been noted to the use of banking aggregates as proxies for overall financial development. Monetary depth will be a misleading indicator of financial development if the savings so mobilized are being monopolized by the state. That is not to say that the liquidity and money transmission services being provided by narrow banking systems are of no importance, but they are arguably simpler to achieve: the hugely important credit dimension cannot be neglected. Turning to private credit, an issue of quality arises: if expanded too rapidly or too much, credit creates risks both microeconomic (poor judgement on the allocation of credit) and macroeconomic (excessive leverage creates linked vulnerabilities to various adverse shocks).

Two other quantitative bank-related measures of financial development have been proposed and I mention them here for completeness. Neither is unproblematic. First is the value-added of the banking sector as measured in the national income and expenditure accounts.[17] To the extent that the value-added does represent the contribution of the sector to GDP, it would appear to be a potentially good measure. In particular, if the prices charged and profits received indicate social value provided, then it may take us beyond the aggregates. However, it is largely an input-based measure in an environment often characterized by lack of competition, and one in which many of the social benefits of intermediation may not be captured by the intermediaries. Protection and lack of competitiveness in the financial system are likely to increase unit costs and profitability, thereby expanding this measure while holding the effectiveness of the system well below its potential.

The other bank-related measure is one of efficiency: interest rate spreads or margins.[18] This potentially disposes of the problem of uncompetitive systems, but is very partial in its focus: scale has fallen out altogether. Also, since interest spreads vary widely depending on the credit and maturity risks, as well as the monitoring costs that are involved, they may be considered exceptionally problematic in a cross-country comparison.

Scale and activity of equity and bond markets

Though bank-dominated financial systems remain the norm in developing countries, increasing emphasis has been placed in recent years on the development of securities markets (mainly for debt and equities, though the growth of derivatives markets has been especially rapid). A comprehensive statistical view of financial system development clearly needs to take these markets into account also and this has been done largely with the use of aggregates such as total market capitalization, and the liquidity of the stock market as measured by the turnover ratio. Some studies suggest that market activity, as measured by the turnover ratio, predict growth (Levine and Zervos 1998; Beck and Levine 2002).[19]

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[17] There are some important technical issues here related to the allocation of banking margins – the so-called "imputed service charge".

[18] Spreads are measured by subtracting one interest rate from another; margins by expressing net interest receipts of an intermediary as a percentage of total assets or some other relevant aggregate.

[19] Personally I have some doubts that the turnover ratio is simply capturing churning; is it not likely that instead it is acting as a proxy for the degree of genuine reliance on the stock market for financing. Markets in which there is little trading of the listed shares are likely to be those in which the share of corporate

However, attempts to judge the relative success of economies with large banking systems and those with large or active stock exchanges have so far proved, in my reading, inconclusive (cf. Demirgüç-Kunt and Levine 2002). It seems that countries have done rather well with a wide variety of relative bank- and market-intensities. Perhaps each of these advanced countries has seen an adaptation of its financial structure to accommodate both the particular needs of its nonfinancial sectors and its inherited legal, administrative and informational infrastructure.

5. Using data on infrastructure to construct a composite indicator of financial development

Indeed, intriguingly, what is found consistently across many studies is that the functioning of financial markets is more effective where certain governmental, informational and legal pre-conditions are also present. In this section we consider how such findings could be drawn upon to help construct a more balanced and comprehensive measure of financial development that captures these additional dimensions.

Perhaps a *caveat* is not out of order here. We have also seen how similar variables have been employed as econometric *instruments* for banking depth in the finance and growth literature. But a variable cannot logically be both a valid instrument and an appropriate component in a composite financial development indicator. After all, a valid instrument must have its effect on the dependent variable (growth in the case above) only through the variable being instrumented. Its exclusion from the main causal regression must be justified. In devising a composite indicator, care should be taken to avoid being trapped in a contradiction where we assert that a particular environmental or infrastructural variable has a direct effect, and in addition rely on the results of some study where it has been employed as an instrument.[20]

Bearing this caution in mind, but forging bravely ahead, let me assert as a stylized summary of the literature that legal, regulatory and informational infrastructure has a strong impact on the degree to which particular financial structures (banking systems of a certain depth, stock markets of a certain level of activity) are actually effective in delivering the benefits that we would like to see: long-term growth, insulation, access to SMEs and microenterprises, and poverty reduction. Some of this infrastructure may also have an independent direct effect.

If infrastructure is a crucially important component of financial development, it seems that a summary measure of financial development should include it in some way. In the remainder of the paper I would like to sketch an approach to devising a composite indicator, and offer a preliminary examination of whether it would make much difference in practice as compared with conventional size-based measures of financial development.

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outsiders in ownership is also low, and that the stock market may not therefore be performing much of a governance function.

[20] There has to be some question as to whether some of the institutional variables that have been employed as instruments really do satisfy the necessary exclusion criteria: as mentioned above this is not something that is easily tested.

We can picture the situation as a multiple-input, multiple output situation at the center of which the measured structures x_i of the financial system sit: influenced by the infrastructural inputs z_j, influencing the outputs y_k. Other factors w_l will also be relevant. Examples of structures: banking depth, stock market turnover; examples of infrastructure: legal system, quality and style of regulation, informational infrastructure; examples of output: GDP growth, stability of output and employment, poverty. If the process can be written:

$$y_k = f^*_k(x, z, w) = f_k(g_k(x, z), w) \tag{1}$$

then we can think of the function g_k as capturing the contribution of finance (structure and infrastructure) to the output k. An overall objective function $W(y)$ may be postulated to aggregate the outputs. Then the marginal contribution of a financial structure variable x_i to the objective function W can be written

$$\frac{dW}{dx_i} = \sum_k W_k f_{k1} g_i = \sum_k \frac{\partial W}{\partial y_k} \frac{\partial f_k(g_k(x,z),w)}{\partial g_k} \frac{\partial g_k(x,z)}{\partial x_i} \tag{2}$$

If f is linear in its two components, then this expression will be independent of the other non-financial factors w.

In a linear approximation then, a composite financial development indicator would be a weighted average of the various components:

$$D = a + \sum_i b_i x_i + \sum_j c_j z_j \quad \text{where } b_i = \sum_k W_k f_{k1} g_{ki} \; ; \; c_j = \sum_k W_k f_{k1} g_{kj}$$

So much for the algebra. Let me illustrate with some examples which will serve to illustrate the diversity of the data sources being employed in the recent literature to dig behind the aggregates and try to uncover the mechanisms that are at work in linking finance to wide economic goals.

I will take three particular infrastructural dimensions: legal, regulatory and ownership, and look at just a handful of papers that illustrate the way in which infrastructure interacts with the financial system itself in influencing outputs along – again – three major dimensions, growth, stability and distributional aspects.

Legal infrastructure

In their highly influential 1997 and 1998 papers, La Porta et al. (LLSV) assembled a database on the major distinguishing characteristics of legal systems in different countries as they impact financial contracts and control. In essence the major distinctions lie in the relative protection that is provided to a firm's managers, controlling shareholders and other insiders as against outsider financiers including both creditors and minority shareholders. Fairly systematically, the relative protection formally granted correlates

with the degree of development of the relevant market. Stronger shareholder rights are, on a cross-country basis, associated with a greater number of listed firms and with higher stock market capitalization; stronger creditor rights are associated with a higher level of bank credit and bond finance.[21, 22]

Looking behind the national aggregates to the performance of individual firms, Beck, Demirgűç-Kunt and Maksimovic (2002) draw on a recent survey of some 4,000 firms – small and large – in 54 countries that were asked for their perception of financing, legal and corruption constraints to their growth. The responses allow one to pinpoint where in the economy these constraints are biting. Uniformly, while all sizes of firms report constraints, uniformly it is the smaller firms whose growth is being more affected by a given level of self-reported constraint. Disappointingly, the answers to more detailed questions on the specific nature of the constraint (11 specific questions about legal constraints, for example) fail to predict firm growth rates, making it difficult to draw detailed inferences on what are the most damaging legal difficulties.[23] Interestingly the main explanatory power comes from comparing average experience across countries: the within-country variation in self-reported legal (and other) constraints is not highly correlated with individual firm performance. Thus (even though the systemwide "law and order" variable from the abovementioned KKZ database does not add much explanatory power to the self-reported legal constraints in predicting differences in firm growth), it does seem to be cross-country differences in legal conditions that matter rather than just the idiosyncratic experiences varying from firm to firm.[24]

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[21] These papers have led to an explosion of research refining and deepening the results. For example, Emre Ergungor (2002) shows that it is mainly in common law countries that creditor rights explain variations in banking sector development (and he also explains why this should be expected).

[22] An ongoing debate concerns the primacy of legal origin and geographic endowments in creating the environment for subsequent financial and wider economic development. Using a sample of 70 former colonies, Beck, Demirgűç-Kunt and Levine (2003) find evidence for both hypotheses. However, it is initial endowments that are more robustly associated (than legal origin) with financial intermediary development and they also explain more of the cross-country variation in financial intermediary and stock market development than does legal origin. But this debate does not affect the validity of legal origin as an instrument. Just why legal origin should matter is discussed by Beck, Demirgűç-Kunt and Levine (2002), perhaps because some legal traditions do a better job at defending private interests against the state, or perhaps (and what evidence there is favors this one) law in some traditions is better able to adapt itself to varying commercial conditions. Political – and as such time-varying – influences from interest groups on the policies determining financial development are emphasized by Rajan and Zingales (2002).

[23] Details of the self-reported financing constraints are more informative in this regard: high collateral requirements, banking bureaucracy, high interest rates, need for the borrower to have a special connection with the bank, and "banks lack money to lend" all correlated with firm growth.

[24] Note a hidden assumption here, namely that defining good-for-finance legal systems is unproblematic. We already highlighted the fact that different legal systems attach different priorities to the main players. Most writers on this topic assume that enforcement of creditor rights is the key thing, but a respectable theoretical proposition can be made to the effect that lenience in this regard might encourage entrepreneurship: however, the empirical evidence, including that cited here, seems to argue against such a soft proposition. In developing countries policy discussion focuses as much (or more) on the judicial and administrative enforcement of the law as on how to tilt the legal protections in law: few would disagree with the importance of enforcement.

Regulatory

If the content of the law may be less important than the fact that it is enforced, an argument can be made that the opposite is true for prudential regulation. Practitioners of regulation typically see the regulators as disinterested technocrats for whom the only requirements are adequate legal powers and sufficient skilled resources. However, the wider perspective of the economic analyst points to self-serving or politically biased regulatory performance. And the informational and skill requirements for the effective pursuit of some regulatory strategies is simply beyond reach in most countries, with the result that the damaging side-effects of regulatory capture and rent-seeking may be incurred without any compensating gain in stability. The World Bank's extensive survey of regulatory practice in 107 countries (a second wave has recently been conducted) allows the impact of regulatory style on financial stability and financial development to be assessed quantitatively. Barth, Caprio and Levine (BCL 2002) et al find that the regulatory choices made on some three dozen different dimensions tend to cluster into one of two styles, which they term the "grabbing hand" and the "helping hand". The interventionist "grabbing hand" approach relies heavily on discretionary official supervision of bank activities; the "helping hand" approach empowers market discipline by, for example, ensuring information disclosure, and removing discretion that could turn into excessive forbearance. Perhaps unsurprisingly (given the loaded terminology) they proceed to show that helping hand policies work better for promoting bank development, performance and stability—at least in the sense of limiting the frequency of systemic banking failures and reducing non-performing loans. But the less discretionary approach may come at a cost in terms of amplifying short-term fluctuations, as shown in evidence presented by Caprio and Honohan (2002).

Ownership (government and foreign)

A third infrastructural characteristic (overlapping to be sure with the regulatory classification above) relates to ownership. If government decides to take a large ownership share in the banking system, or to exclude foreign-owned banks systematically from a large share in the system, will financial sector performance improve or diminish? A growing literature has studied these issues with generally market-friendly findings. The cross-country findings by La Porta et al (2000), showing that a higher degree of state ownership was associated with lower financial sector development, lower growth and lower productivity, and a higher risk of crises have been confirmed by several subsequent studies (including Barth et al 2003).

The case of foreign ownership is more highly contested, given the widely observed tendency for the typical foreign-owned bank to lend to larger firms, and the fear that their commitment to the host country might be limited, with the result that they might have a greater tendency to exit in a downturn. However, data-based findings (surveyed by Clarke et al. 2002[25]), suggest that these concerns are over-done and that entry of foreign banks tends to improve the efficiency and stability of the financial system. Even small

[25] See also Levine (2002) confirming in a striking way the favorable impact of foreign banks on bank spreads. More widely, the role of competition in improving performance but potentially adding to vulnerability is examined in the papers presented at a World Bank conference in Washington DC in April 2003, see http://www.worldbank.org/research/interest/confs/bank_concentration.htm.

firms report easier access to finance in systems with larger foreign bank penetration (as is shown by Clarke et al. 2001, using the 400-firm database mentioned above).

Numerical implications

Drawing from these studies, we may propose an extended set of measures of financial development, combining not only scale and competitive efficiency, but also the presence of these major infastructural preconditions. Unfortunately, a metastudy of the existing literature based on the framework outlined in (1) and (2) above is not altogether straightforward.

For one thing, there does not seem to be any existing discussion in the literature on the policy weights to be assigned to the different components of outturns (the W_k). Much of the literature seems to proceed as if growth were the only objective, but this surely cannot be so. Aggregate national fluctuations cannot easily be insured, so the second moment must be of some relevance. Likewise the poverty dimension may be important if, as has been suggested by the empirical evidence provided above, some policy approaches are more effective in reducing poverty than others, conditional on growth. Finally, it is likely that growth at the production frontier (attained in advanced economies) has somewhat different determinants than growth that is mainly a convergence to that frontier. If they embody new technology, access by new firms to finance may be even more important for growth at the frontier than away from it. For the present then, the literature does not tell us much about how to value these different components, which we need to do according to equation (2) above.

The second difficulty is a more practical one, namely that the various empirical studies have not all been set up to closely conform with equation (1). Different variables are used on both sides of the equation and so forth. So arriving at an acceptable summary is a task which, though not insurmountable, has not yet been accomplished.

But we can already begin to see whether the composite indicator has the potential to be substantially different from the size-based measures. Could it, for example, result in a considerable re-ordering of the international league table of financial development?

As an initial illustration along these lines, we took the developing countries already examined in the poverty exercise above and assembled data on (i) governance and legal institutions (KKZ and LLSV data) and (ii) regulatory approach (BCL data) and ownership (also from BCL). The same indicators are not always available for all countries, indeed, for only 17 of the poverty countries are they all available. Table 8 (panel A) shows that pairwise the indicators are not highly correlated among themselves or with the size and activity measures (Table 8 shows the correlations on the basis of the common sample, those based on the much larger maximal samples are broadly similar). Even when aggregated in an ad hoc manner[26] to three sub-aggregates the correlations are all moderate (panel B). This suggests that re-ranking is quite possible depending on the weights used.

[26] Essentially by normalizing and adding together, with algebraic sign corresponding to the literature's consensus on the direction of impact on growth.

Indeed, Figure 6 illustrates the contrast for about 20 countries, using an aggregate of (i), (ii) and (iii) as a preliminary non-size composite. Countries substantially above or below 45 would be re-ranked by an index that combined the size and non-size data. The way in which re-ranking would occur can be seen by rotating the chart to the right: the angle of rotation indicating the relative weight on the non-size component. It can be seen in particular that China, which as mentioned has the largest banking system as a share of GDP, would lose this title with quite a moderate weight (0.3) on the the non-size composite (when both are normalized to zero mean and unit variance).

Further work will be needed to fill out the data set and choose weights in a systematic manner.

6. Conclusion

Probing financial development by means of cross-country regressions has greatly enriched our understanding of the processes most likely to be at work. The apparent importance of financial development for contributing to sustainable economic growth has been underlined. Second generation models have probed additional dimensions of both cause (finance) and effect (sustainable economic development). We have shown that finance-intensive growth (at least as measured by banking depth) is empirically associated with lower poverty ratios. On the other hand, depth alone is an insufficient measure of financial development, and we have suggested an approach to defining a more comprehensive summary statistic, drawing on results in the literature.

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Figure 1: "*post hoc ergo propter hoc*",
Mean GDP growth rate 1960-2000 of country groups sorted by 1960 financial depth
(Source: *World Development Indicators* (GDP), *International Financial Statistics* (Liquid liabilities)

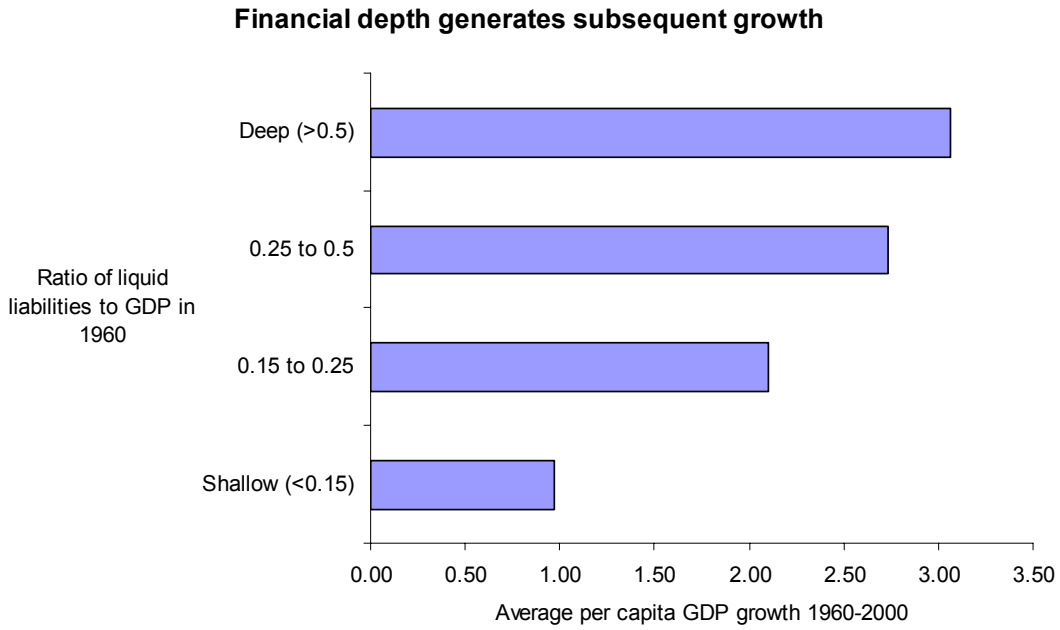

Figure 2: Modeling the effects of reverse causality
Source: Levine, Loayza, Beck (2000); World Bank (2001).

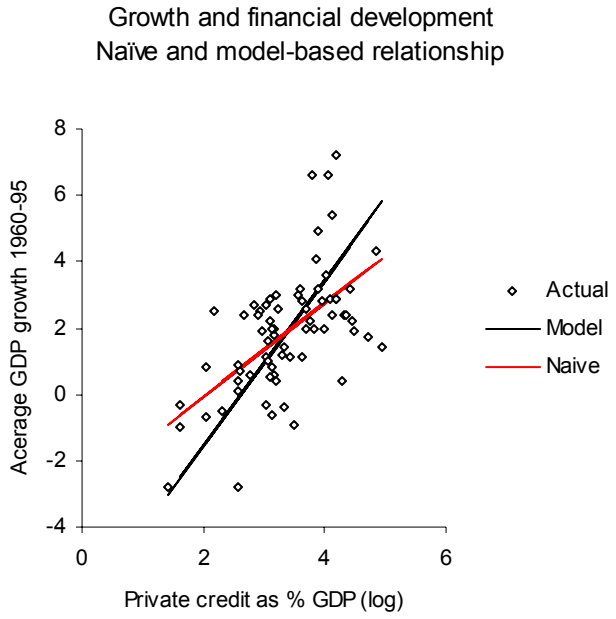

Figure 3: China: Provincial banking depth and growth
Source: Boyreau-Debray (2003)

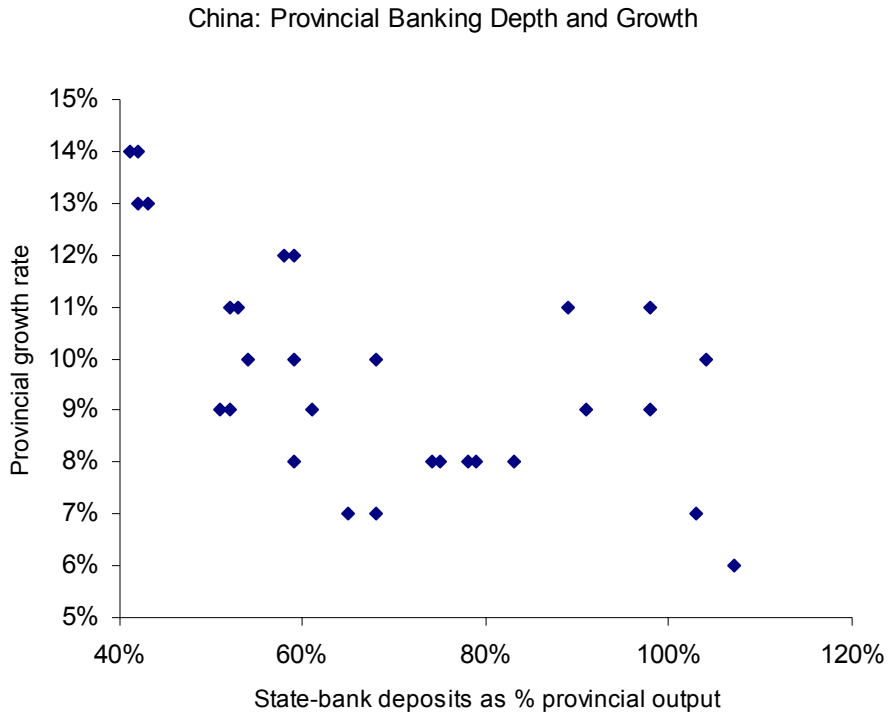

Figure 4: UK – Money and Growth, 1951-1980
Source: *International Financial Statistics*

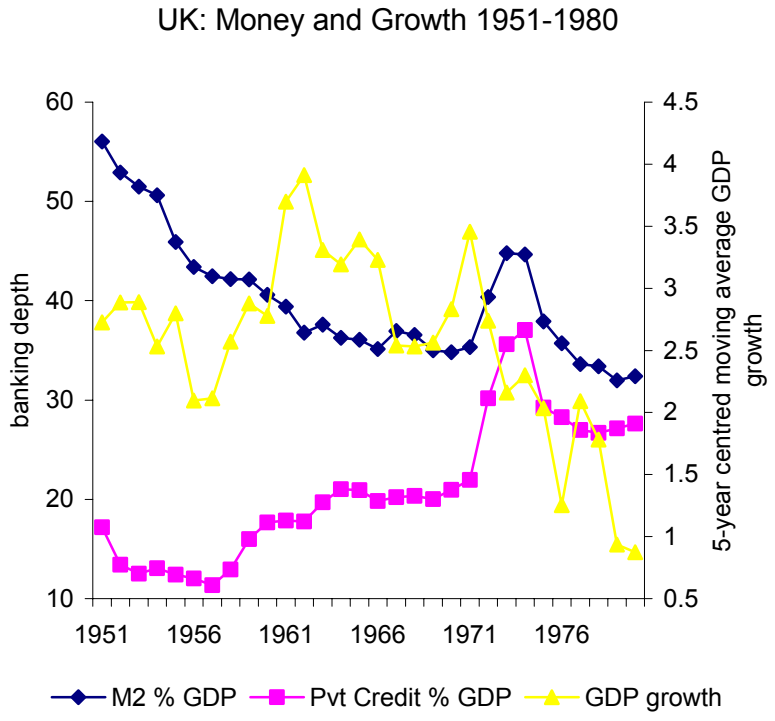

Figure 5: Korea – Money and Growth 1961-2002
Source: *International Financial Statistics*

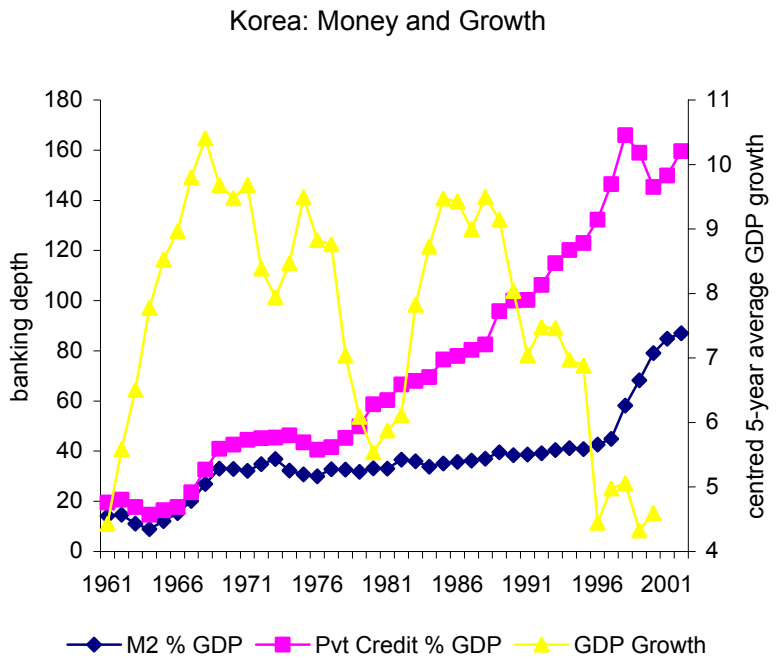

Figure 6: Financial Depth and Financial Infrastructure – Cross Country Comparison
(Most recent year available)
Source: See note to Table 8.

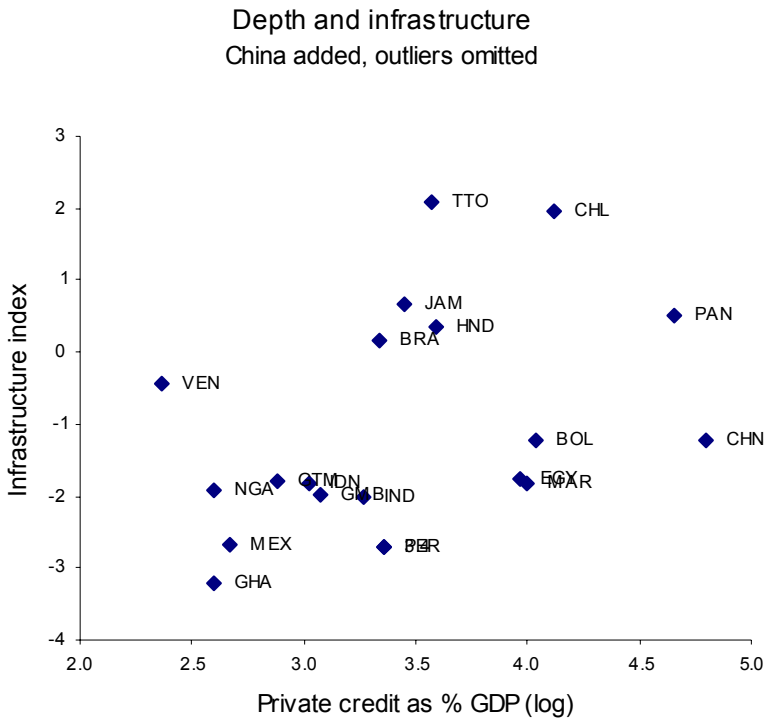

Table 1. Poverty and Financial Depth
(Dependent Variable: $1 per Day Poverty Ratio)

Equation:	1.A		1.B		1.C		1.D		1.E		1.F	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	152.0	**9.0	229.8	**9.9	184.4	**7.3	164.9	**6.3	184.3	**7.6	152.1	**5.8
GDP per cap (log)	-16.6	**7.8										
GDP per cap lower 90% (log)			-17.3	**9.0	-15.3	**8.2	-13.4	**6.7	-15.4	**8.6	-11.9	**5.8
Share of top 10%					0.635	**3.4	0.708	**3.8	0.671	**3.7	0.709	**3.8
Private credit							-0.260	**2.5			-0.354	**3.3
Private credit residual									-0.353	**3.2		
Inflation											-0.096	*2.4
R-squared / NOBS	0.462	73	0.535	73	0.601	73	0.636	71	0.652	70	0.663	70
Adjusted R-squared	0.454		0.529		0.590		0.620		0.636		0.642	
S.E. of regression	15.8		14.7		13.7		13.3		13.0		12.9	
Log likelihood	-304.2		-298.8		-293.2		-282.6		-277.1		-276.0	

** and * indicate significance at the 1% and 5% levels, respectively.
Cross section excluding China, Panama and Thailand
Data Sources for all tables: Poverty data from http://www.worldbank.org/research/povmonitor/; Inequality from *World Development Indicators*, except Gini from *Human Development Report*; Financial from IFS; Institutions from Kaufmann, Kraay and Mastruzzi (2003)

Table 1 (alternate). Poverty and Financial Depth
(Alternate data set: including China, Panama and Thailand. Dependent Variable: $1 per Day Poverty Ratio)

Equation:	1.G		1.H		1.J		1.K		1.L		1.M	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	152.8	**9.2	230.8	**10.2	186.1	**7.5	174.4	**6.8	187.8	**7.7	165.8	**6.4
GDP per cap (log)	-16.7	**8.1										
GDP per cap lower 90% (log)			-17.4	**9.3	-15.5	**8.5	-14.3	**7.3	-15.6	**8.7	-13.2	**6.7
Share of top 10%					0.629	**3.4	0.655	**3.5	0.625	**3.4	0.646	**3.5
Private credit							-0.134	**1.9			-0.185	*2.5
Private credit residual									-0.184	*2.5		
Inflation											-0.081	*2.1
R-squared / NOBS	0.467	76	0.541	76	0.605	76	0.625	74	0.634	73	0.643	73
Adjusted R-squared	0.460		0.534		0.594		0.609		0.618		0.622	
S.E. of regression	15.5		14.4		13.5		13.3		13.2		13.1	
Log likelihood	-315.3		-309.7		-304.0		-294.7		-289.9		-288.9	

** and * indicate significance at the 1% and 5% levels, respectively.
Cross section: all available countries

Table 2. Poverty and Financial Depth
(Dependent Variable: $1 per Day Poverty Ratio)

Equation:	2.A		2.B		2.C		2.D		2.E		2.F	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	194.7	**6.1	186.9	**6.8	191.4	**7.4	194.1	**6.5	185.5	**6.2	149.5	**4.9
GDP per cap lower 90% (log)	-16.2	**6.9	-15.6	**7.8	-16.0	**8.3	-16.2	**7.1	-15.5	**7.0	-11.3	**4.5
Share of top 10%	0.649	**3.4	0.666	**3.6	0.666	**3.6	0.649	**3.5	0.669	**3.6	0.485	*2.2
Private credit residual	-0.368	**3.2	-0.361	**3.1	-0.364	**3.3	-0.371	**3.3	-0.355	**3.1	-0.262	*2.5
Institutions (KKF)	2.14	0.5	0.716	0.2	1.82	0.8	2.01	0.6	0.243	0.1		
Which institution	Corrupt		Govteff		Regqual		Regqual		Rulelaw		Regional dummies	
R-squared / NOBS	0.654	70	0.652	70	0.656	70	0.654	70	0.652	70	0.727	70
Adjusted R-squared	0.632		0.631		0.635		0.633		0.631		0.692	
S.E. of regression	13.1		13.1		13.1		13.1		13.1		12.0	
Log likelihood	-276.9		-277.0		-276.7		-276.9		-277.1		-268.6	

** and * indicate significance at the 1% and 5% levels, respectively.

Cross section excluding China, Panama and Thailand; Regression F includes five intercept dummies corresponding to World Bank regional groupings. The omitted (base) region is South Asia. Of the others, the Middle East and North Africa dummy is significant at the 1% level with a negative coefficient.

Table 3. Poverty and Financial Depth
(Dependent Variable: $2 per Day Poverty Ratio)

Equation:	3.A		3.B		3.C		3.D		3.E		3.F	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	215.1	**9.4	313.5	**9.7	269.4	**7.3	251.3	**6.4	266.6	**7.3	233.3	**5.9
GDP per cap (log)	-21.8	**7.6										
GDP per cap lower 90% (log)			-22.4	**8.4	-20.6	**7.6	-18.9	**6.3	-20.4	**7.6	-16.8	**5.4
Share of top 10%					0.639	*2.3	0.714	*2.5	0.666	**3.7	0.701	*2.5
Private credit							-0.232	1.5			-0.355	*2.1
Private credit residual									-0.355	**3.2		
Inflation											-0.110	1.8
R-squared / NOBS	0.439	75	0.492	75	0.527	75	0.547	73	0.552	72	0.663	72
Adjusted R-squared	0.431		0.485		0.514		0.527		0.532		0.642	
S.E. of regression	22.1		21.0		20.4		20.4		20.1		20.0	
Log likelihood	-337.6		-333.9		-331.2		-321.5		-316.2		-315.4	

** and * indicate significance at the 1% and 5% levels, respectively.

Cross section excluding China, Panama and Thailand

Table 4. Poverty and Financial Depth
(Dependent Variable: $2 per Day Poverty Ratio)

Equation:	4.A		4.B		4.C		4.D		4.E	
Dependent variable:	Pov2		Pov2		Pov2		Pov2		Pov2	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	267.6	**5.5	273.2	**6.6	273.1	**6.9	311.1	**6.9	255.6	**5.6
GDP per cap lower 90% (log)	-20.5	**5.8	-20.9	**6.8	-20.9	**7.1	-24.0	**7.0	-19.6	**5.8
Share of top 10%	0.663	*2.3	0.654	*2.3	0.659	*2.3	0.566	*2.0	0.686	*2.4
Private credit residual	-0.357	*2.1	-0.373	*2.1	-0.365	*2.2	-0.427	*2.5	-0.337	1.9
Institutions (KKF)	0.21	0.0	1.65	0.3	1.43	0.4	1.65	1.6	-2.17	0.4
Which institution	Corrupt		Govteff		Polstabl		Regqual		Rulelaw	
R-squared / NOBS	0.552	72	0.553	72	0.553	72	0.569	72	0.553	70
Adjusted R-squared	0.525		0.526		0.527		0.543		0.526	
S.E. of regression	20.2		20.2		20.2		19.9		20.2	
Log likelihood	-316.2		-316.1		-316.0		-314.8		-316.1	

** and * indicate significance at the 1% and 5% levels, respectively.
Cross section excluding China, Panama and Thailand

Table 5. Poverty and Other Dimensions of Financial Development
(Dependent Variable: $1 per Day Poverty Ratio)

Equation:	5.A		5.B		5.C		5.D	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	189.5	**6.5	212.3	**6.6	203.9	**6.7	213.7	**6.0
GDP per cap lower 90% (log)	-15.5	**7.7	-15.6	**7.2	-16.5	**7.4	-16.2	**6.8
Share of top 10%	0.617	**3.3	0.666	*2.3	0.523	**2.7	0.649	*2.3
Private credit residual	-0.368	**3.1	-0.361	**2.9	-0.329	**2.9	-0.371	*2.6
Bank concentration	-4.86	0.6					-3.62	0.3
Stock market capitalization			4.66	0.5			4.72	0.5
Stock market turnover					1.24	0.6	1.10	0.6
R-squared / NOBS	0.638	68	0.669	46	0.671	45	0.673	45
Adjusted R-squared	0.615		0.636		0.638		0.622	
S.E. of regression	12.9		11.0		11.1		11.3	
Log likelihood	-267.9		-172.9		-169.4		-169.2	

** and * indicate significance at the 1% and 5% levels, respectively.
Cross section excluding China, Panama and Thailand

Table 6. Poverty and Financial Depth: Additional Distributional Variables
(Dependent Variable: $1 and $2 per Day Poverty Ratios)

Equation:	2.A		2.B		2.C		2.D		2.E		2.F	
Dependent variable:	Pov1		Pov1		Pov1		Pov2		Pov2		Pov2	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	182.7	**5.5	146.5	**2.5	181.4	**7.3	269.6	**5.4	102.7	1.2	264.4	**7.2
GDP per cap lower 90% (log)	-15.4	**8.4	-15.3	**8.3	-15.3	**8.4	-20.5	**7.5	-20.1	**7.7	-15.3	**7.5
Share of top 10%	0.668	**3.2	0.950	*2.2	0.373	0.7	0.672	*2.3	2.005	**3.3	0.300	0.4
Share of second 10%	0.090	0.1	1.228	0.6			-0.182	0.1	5.197	1.8		
Share of lowest 10%			3.175	0.7					15.16	*2.5		
Gini (hdr)					0.270	0.6					0.690	0.5
Private credit residual	-0.353	**3.2	-0.369	**3.3	0.353	**3.2	-0.354	*2.1	-0.369	*2.6	0.356	**2.1
R-squared / NOBS	0.652	70	0.655	70	0.654	70	0.552	72	0.590	72	0.554	72
Adjusted R-squared	0.631		0.628		0.633		0.525		0.559		0.527	
S.E. of regression	13.1		13.2		13.1		20.2		19.5		20.2	
Log likelihood	-277.1		-276.8		-276.9		-316.1		-312.9		-316.0	

Pov 1 (2) are the $1 ($2) per Day Poverty Ratios
** and * indicate significance at the 1% and 5% levels, respectively.
Cross section excluding China, Panama and Thailand

Table 7. Predicted Financial Depth (Auxiliary Regression)
(Dependent Variable: Private Credit as share of GDP)

Equation:	7.A		7.B	
	Coeff.	t-Stat	Coeff.	t-Stat
Constant	55.1	*2.5	-41.6	**2.7
GDP per cap (log)	11.1	**4.0	8.82	**4.5
Inflation	-0.175	**2.9	-0.123	**3.0
R-squared / NOBS	0.226	75	0.269	72
Adjusted R-squared	0.205		0.248	
S.E. of regression	21.3		14.6	
Log likelihood	-334.2		-293.8	

** and * indicate significance at the 1% and 5% levels, respectively.
Note: 7.A includes all countries; 7.B excludes China, Panama and Thailand

Table 8: Correlations matrix: size, activity and institutional variables

Panel A: Individual series

	PVTCRED GDP	MKTCAP	TURN OVER	BNK CONC	PROPERTY RIGHTS	MEAN KKZ	OFFICIAL PC	CAPINDEX PC	RESTRICT PC	PRIVATE INDEXPC	FOREIGN OWNED	STATE OWNED
Private credit % GDP	1.00	0.52	-0.23	-0.06	0.18	0.58	-0.12	-0.02	-0.30	0.37	0.12	-0.21
Market capitalization % GDP	0.52	1.00	-0.03	0.31	0.38	0.58	-0.72	0.19	-0.34	0.44	-0.17	-0.17
Market turnover % GDP	-0.06	0.31	0.12	1.00	0.02	-0.04	-0.49	0.24	0.25	-0.22	-0.11	0.36
Bank concentration	-0.23	-0.03	1.00	0.12	-0.27	-0.15	-0.15	0.07	0.01	0.02	-0.44	0.58
Property rights	0.18	0.38	-0.27	0.02	1.00	0.66	-0.09	0.12	0.01	0.01	0.06	-0.09
Governance (mean KKZ)	0.58	0.58	-0.15	-0.04	0.66	1.00	-0.28	0.17	-0.19	0.07	0.28	-0.12
Official regulation	-0.12	-0.72	-0.15	-0.49	-0.09	-0.28	1.00	-0.40	0.21	-0.03	0.33	0.23
Capital requirements	-0.02	0.19	0.07	0.24	0.12	0.17	-0.40	1.00	-0.13	-0.09	0.18	-0.10
Line of business restrictions	-0.30	-0.34	0.01	0.25	0.01	-0.19	0.21	-0.13	1.00	-0.37	-0.04	0.39
Market discipline	0.37	0.44	0.02	-0.22	0.01	0.07	-0.03	-0.09	-0.37	1.00	-0.31	-0.15
Foreign owned banks (%)	0.12	-0.17	-0.44	-0.11	0.06	0.28	0.33	0.18	-0.04	-0.31	1.00	-0.23
State owned banks (%)	-0.21	-0.17	0.58	0.36	-0.09	-0.12	0.23	-0.10	0.39	-0.15	-0.23	1.00

Panel B: Sub-aggregates

	PVTCREDGDP	PHINST	PHREG	PHOWN
Depth	1.00	0.49	0.45	0.11
Institutions	0.49	1.00	0.38	0.15
Regulation	0.45	0.38	1.00	-0.11
Ownership	0.11	0.15	-0.11	1.00

Note: For the individual series, the mnemonics in the colums headings are as in the sources. MEANKKZ is the mean of the six KKZ governance indexes. The sub-aggregates in panel B are computed as follows: Depth is PVTCREDGDP; Institutions is Average of normalized PROPERTYRIGHTS and MEANKKZ; Regulation is the algebraic sum of OFFICIALPC, CAPINDEXPC, RESTRICTPC and PRIVATEINDEXPC: all except the last with minus sign; Ownership is FOREIGNOWNED minus STATEOWNED.
Source: Based on data in Barth, Caprio and Levine, 2002; Kaufmann, Kraay, Mastruzzi, 2003; Levine, Loayza and Beck, 2000; *International Financial Statistics*.