WHAT IS HAPPENING TO THE IMPACT OF FINANCIAL DEEPENING ON ECONOMIC GROWTH?

by

Peter L. Rousseau and Paul Wachtel

DEPARTMENT OF ECONOMICS
VANDERBILT UNIVERSITY
NASHVILLE, TN 37235

www.vanderbilt.edu/econ

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Peter L. Rousseau
Vanderbilt University
Department of Economics
Box 1819 Station B, Nashville, TN 37235, USA
and National Bureau of Economic Research
peter.L.rousseau@vanderbilt.edu.

Paul Wachtel
Stern School of Business
New York University
44 West 4th Street
New York, NY 10012 USA
pwachtel@stern.nyu.edu

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Although the finance-growth relationship is now firmly entrenched in the empirical literature, we show that it is not as strong in more recent data as it was in the original studies with data for the period from 1960 to 1989. We consider several explanations. First, we find that the incidence of financial crises is related to the dampening of the effect of financial deepening on growth. Excessive financial deepening or too rapid growth of credit may have led to both inflation and weakened banking systems which in turn gave rise to growth-inhibiting financial crises. Excessive financial deepening may also be a result of widespread financial liberalizations in the late 1980s and early 1990s in countries that lacked the legal or regulatory infrastructure to exploit financial development successfully. However, we find little indication that liberalizations played an important direct in reducing the effect of finance. Similarly, there is little evidence that the growth of equity markets in recent years has substituted for debt financing and led to a reduced role of financial deepening on growth.

1. **Introduction**

   Among the strongest elements of the modern economists' canon is that financial sector development has a significant impact on economic growth. A generation ago, economists like Goldsmith (1969)[1] and McKinnon (1973) began to draw attention to the benefits of financial structure development and financial liberalization. In 1991 (p. 12) McKinnon could write with confidence that:

   > "Now, however, there is widespread agreement that flows of saving and investment should be voluntary and significantly decentralized in an open capital market at close to equilibrium interest rates."

Since the 1990s, a burgeoning empirical literature has illustrated the importance of financial sector development for economic growth. Despite the growing consensus, however, we find that the link between finance and growth in cross-country panel data has weakened considerably over time. At the very time that financial sector liberalization spread around the world, the influence of financial sector development on economic growth has diminished.

   The seminal empirical work that established the growth-finance link is King and Levine (1993), which extended the cross-country framework introduced in Barro (1991) by adding financial variables such as the ratios of liquid liabilities or claims on the private sector to gross domestic product (GDP) to the standard growth regression. They found a robust, positive, and statistically significant relationship between initial financial conditions and subsequent growth in real per capita incomes for a cross-section of about 80 countries. In the subsequent decade numerous empirical studies expanded upon this, using both cross-country and panel data sets for the post-1960 period.[2]

   In this paper we reexamine the core cross-country panel result and find that the impact of financial deepening on growth is not as strong with more recent data as it appeared in the original panel studies with data for the period from 1960 to 1989. We

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[1] Goldsmith, for example, found a positive relationship between economic growth and financial development using a comparative approach with data for thirty-five countries over the period from 1860 to 1963.

[2] Levine (1997) surveys the literature through the mid-1990s, and Levine (2005) offers a comprehensive treatment of the many contributions that have followed. See also Temple (1999).

consider various explanations for this clear shift. First, we suggest that financial deepening has a positive effect on growth if not done to excess. Rapid and excessive deepening, as manifested in a credit boom, can be problematic even in the most developed markets because it can both weaken the banking system and bring inflationary pressures. We test this hypothesis by looking at the finance-growth nexus among countries that have or have not experienced financial sector crises. We find that once crisis episodes are removed, the finance-growth relationship remains intact. Its weakening over time thus seems to be a result of an increased incidence of crises in later years.

Our second and related hypothesis is that the widespread liberalization of financial markets that occurred in the late 1980s and early 1990s made financial deepening less effective. This is reminiscent of Robert Lucas's (1975) critique of econometric policy evaluation advanced three decades ago. Policies that have promoted and/or forced increases in financial depth over the past two decades may have altered the basic structural relationship between finance and growth. This could occur if the observed benefits of financial deepening led many countries to liberalize before the associated legal and regulatory institutions were sufficiently well developed. As a consequence, the impact of financial deepening on growth would become smaller. Our evidence does not indicate that recent liberalizations are responsible for the breakdown of the finance-growth link. However, there may be an indirect link since premature financial development can lead to financial crises that have real effects.

Third, we examine the role of global equity markets that have grown in importance and prominence in the years over which the finance-growth relationship disappeared. However, we do not find any evidence to suggest that equity market growth has substituted for the role of credit markets and banks in particular.

We also examine some sample composition effects. For example, we distinguish between developed and developing countries. Although the finance growth relationship is somewhat stronger among developed countries, the decline in the impact of finance on growth in recent years is found in both groups.

Further we look at several estimation techniques in order to be confident of the robustness of our major finding, the virtual disappearance of the finance-growth

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relationship in recent data. The finance-growth literature uses various estimation approaches because of the difficulty in adequately controlling for endogeneity. We examine pure cross-section estimates, panels of five-year average growth rates, and dynamic panels in order to show that our basic result is robust to choice of estimation technique.

Although the finance-growth nexus has become firmly entrenched, this is not the first study to question its importance. Economists as disparate as Joan Robinson and Robert Lucas have expressed doubts about the link.[3] In addition, some authors have been less than enthusiastic about the strength of the recently established empirical consensus and there are indications that the relationship varies and lacks robustness.[4]

A few earlier papers have noted that the relationship between financial deepening and growth varies considerably across countries (e.g. Demetriades and Hussein 1996; Rousseau and Wachtel 1998; Arestis, Demetriades, and Luintel 2001). Rousseau and Wachtel (2002) show that the relationship varies with the inflation rate; financial deepening does not affect growth when annual inflation is above a threshold of about 13 percent. Rioja and Valev (2004) also show that the relationship varies with the level of economic development. Specifically, deepening has a larger impact on growth with a moderate level of financial sector development. However, none of the earlier studies has provided an explanation for why the relationship has weakened over time.

A recent paper by Loayza and Ranciere (2006) addresses the dual role of financial deepening discussed above. They distinguish between the short run impact of credit expansions on growth and the long run positive impact of financial deepening on growth. The short run effect is sometimes negative, particularly during episodes of financial crisis. Our approach to this dual role of finance is somewhat different. First, we investigate how banking crises and liberalizations affect the impact of financial deepening on growth. Second, we relate these phenomena to the secular decline in the

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[3] Lucas (1988) suggests that the role of finance is "over-stressed" and Robinson (1952, p. 80) asserts that "where enterprise leads, finance follows."

[4] The titles of some recent papers express the growing skepticism: e.g. "How much do we really know about growth and finance?" Wachtel (2003) and "Finance causes growth: Can we be so sure?" Manning (2003).

impact of financial deepening observed in the classical cross-country panel regression framework.

The next section describes the data and the by now standard approach to panel estimates of growth equations. In Section 3 we present baseline estimates and show that the finance-growth nexus has weakened over time. In Section 4 we examine the hypotheses suggested above regarding the possible causes of the decline in the effect of financial deepening on growth. Section 5 presents some additional evidence on the relationship between the strength of the finance-growth link and the levels of economic development and financial depth in a country. Our conclusions are in Section 6.

2. Data and methodology

Our study includes cross sectional and panel data on financial and macroeconomic indicators for 84 countries over the period from 1960 to 2004.[5] Data are from the 2007 edition of the World Bank's *World Development Indicators* database. The selection of countries is based on data availability from this source. To ensure comparability with King and Levine's original study and others, we use three familiar measures of financial development, namely the ratios to GDP of liquid liabilities (M3), liquid liabilities less narrow money (M3 less M1), and credit allocated to the private sector. M3 as a percent of GDP has become a standard measure of financial depth and an indicator of the overall size of financial intermediary activity in cross-country studies. M3 less M1 removes the pure transactions asset and the credit measure isolates intermediation to the private sector from credit allocated to government or state enterprises.

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[5] The 84 countries are Algeria, Argentina, Australia, Austria, Bangladesh, Barbados, Belgium, Bolivia, Brazil, Cameroon, Canada, Central African Republic, Chile, Colombia, Costa Rica, Cote d'Ivoire, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Finland, France, Gambia, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Republic of Korea, Lesotho, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, Sierra Leone, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand, Trinidad and Tobago, Togo, Turkey, United Kingdom, United States, Uruguay, Venezuela, and Zimbabwe.

King and Levine's version of the Barro growth regression, and the starting point for our analysis, has the form

$$Y_{it} = \alpha_0 + \alpha F_{it} + \beta X_{it} + u_{it,} \tag{1}$$

where Y_{it} is the growth rate of real per capita GDP, F_{it} is a measure of financial sector development, and X_{it} is a set of baseline explanatory variables that have been shown empirically to be robust determinants of growth. The X variables include the log of initial real per capita GDP, which should capture the tendency for growth rates to converge across countries and over time, and the log of the initial secondary school enrollment rate, which should reflect the extent of investment in human capital. We include the ratio of trade (i.e., imports plus exports) to GDP and the ratio of government final consumption to GDP as additional explanatory variables.

Following King and Levine, we start with cross sectional estimates where the dependent variable is the average annual growth rate over our entire data period (i.e., 1960-2004). To reduce any simultaneity bias that might result from the influence of economic growth on the development of the financial sector, we use initial values from the start of the cross section for all explanatory variables in the regression. Following the subsequent literature, we also exploit the time series variation in the data by estimating equation (1) with a panel of 5-year averages. In these regressions we use instrumental variables to reduce any simultaneity bias. Specifically, we attempt to extract the predetermined component of the financial variable by using its initial value (in each 5-year average) along with the initial values of government expenditure and trade as percentages of GDP as instruments in each regression equation. All panel estimates include time period fixed effects. Finally, we will also present estimates with system GMM dynamic panel estimation techniques that have become common in the literature.[6] Our fundamental result, that the finance growth relationship weakened dramatically, is robust to the choice of estimation approach.

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[6] Our use of the "System GMM" estimator parallels that introduced to the finance-growth literature by Levine, Loayza, and Beck (2000). We complement this with a small sample correction of the standard errors as described in Windmeijer (2005).

3. The decline in the finance-growth relationship

Table 1 contains results from the baseline cross section growth equations for each of the three measures of financial depth for the full data period, 1960-2004, and two subperiods. The first subperiod, 1960-89, coincides with the time period analyzed by King and Levine and others that established the consensus results that have become so important. The results for 1960-89 and for the full period are largely consistent with this consensus.[7] For the 1960-89, the coefficients on the financial variables are all positive and significant at the 5 percent level; the same is true for the full period except for the ratio of private credit to GDP. The contrast with the second subperiod is dramatic; none of the finance variables is significant in the cross section for 1990-2004. The coefficients on the log of initial real GDP is negative and statistically significant for the 1960-89 and 1960-2004 periods, which is consistent with the notion of beta convergence, but they are not significant for 1990-2004. The positive and significant coefficients on the log of the initial secondary school enrollment rate in all specifications suggest that human capital investment matters for growth. The other control variables - government expenditure and trade as percentages of GDP - are not always significant in these cross section results but robustness tests (not shown) indicate that their presence or absence does not have much effect on the finance coefficients.

The dramatic difference between the initial and recent time periods found in the cross section estimates of Table 1 is repeated when we look at panels with five-year averages estimated with both standard two-stage least squares and with dynamic system GMM. Tables 2 and 3 present these same equations estimated with the alternative techniques. With all three estimation approaches, the effect of financial depth on growth, which is always significant in the first 30-year period, disappears in the next 15. Whereas all of the finance coefficients are significant at the 5 percent level in the early time period, none are significant in the more recent data and the coefficients fall to near zero

To examine further the differences over time in the effect of financial depth on

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[7] The slight differences in these results from earlier published work with the same data definitions arise because later editions of the World Bank's *World Development Indicators*, such as the one that we use from 2007, provide some observations for earlier years that were missing from previous editions.

growth, we estimated the baseline equation separately with the cross section of data from each 5-year period. That is, from 1960 to 2004 there are nine cross sections. Instrumental variable regressions with each of the three measures of financial depth are summarized in Table 4 which shows only the finance coefficients from each cross section regression.[8]

The coefficient on M3 as a percent of GDP is positive and statistically significant for five successive time periods running from 1965 to 1989 but insignificant in the earlier and subsequent periods. The same is true for the coefficients on M3 less M1 with the exception of one time period in the 1980s when the coefficient is not quite significant. In contrast, the coefficient on the private credit ratio is only significantly different from zero in two time periods. But the coefficient on private sector credit is clearly positive (averaging .025) from the late 1960s until 1989 and then falls to zero or below. The coefficient on the M3 ratio falls to zero from 1990 on, as does the coefficient on M3 less M1. Chow tests for the regressions in each table reject the hypothesis of coefficient stability across the nine time periods at the 1 percent level.

These tables provide a clear story. The effect of finance on growth is a disappearing phenomenon. In the next section we examine several hypotheses that might explain the result.

4. Understanding the changes in the finance-growth relationship

In this section we relate changes in the finance-growth relationship to the hypotheses stated in the introduction (section 1). We start by relating the finance effect to the incidence of financial crises. The disappearance of the finance effect on growth over time may be related to the incidence of financial crises since such episodes are often associated with too-rapid financial deepening. There is a thin line between financial deepening that comes from the expansion of financial intermediary activity and financial deepening that is the consequence of a credit boom. In the first instance increased intermediation is likely to be growth enhancing, while in the second instance credit standards deteriorate, nonperforming loans proliferate and a banking crisis ensues. The effect of financial deepening on growth disappears in a financial crisis and the incidence

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[8] The equations estimated include all the control variables used in Tables 1-3.

of financial crises increased in the late 1980s. Thus, the reduced effect of finance on growth may be due to the increased incidence of financial crises.

We investigate this hypothesis by isolating episodes of financial crisis and examining the impact of financial deepening on growth in non-crisis episodes. We use the identification and dating prepared by Caprio and Klingebiel (2003) for systemic banking and financial crises around the world. Of the 84 countries in our sample, 45 have experienced at least one major crisis. We characterize a 5-year country observation as a crisis period if the country was in crisis at any time during the period. The table below shows the number of countries in crisis at any time during each 5 year period.

	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	00-04
Major crisis	0	0	1	4	16	25	23	24	15
Minor crisis	0	0	1	3	5	15	22	15	8

Instrumental variable estimates of the baseline growth equations that allow the finance coefficient to vary when there is either a major or minor financial crisis are shown in Table 5. Each equation shows the finance variable for all observations and then the finance variable interacted with dummies for crisis episodes. The size of the coefficient on the finance variable indicates the impact of finance on growth in non-crisis observations. These effects are all positive, statistically significant, and larger than the corresponding coefficients in Table 2, which does not account for crisis episodes. The interaction with the major crisis dummy indicates the difference in the finance effect when a country is in crisis. In every case, the finance effect is significantly smaller at the 5 percent level when there is a financial crisis. In fact, the impact of financial deepening in these crisis periods is often near zero. The minor crisis episodes also have a negative impact on the finance coefficients but the changes are small and not statistically significant.

Since excessive credit creation can lead to instability and crisis, and financial liberalization is usually associated with the rapid development of financial institutions, capital flows, and increases in liquid liabilities, the disappearance of the finance effect on growth over time could also be related to the rapid liberalization of financial markets in many countries in the latter period. In particular, policy makers have busily touted the

benefits of liberalization of financial markets and the growth of financial institutions throughout the 1980s and 1990s. However, the increases in financial depth in many countries took place without the requisite development of lending expertise, mechanisms for monitoring, and supervisory and regulatory skills. So the relationships observed in the early data may have disappeared as efforts to liberalize financial markets became widespread.

In order to explore the impact of liberalizations we use the dating of equity market liberalizations in Bekaert, Harvey and Lundblad (2005). They use a variety of sources to date an important element of financial sector liberalization, the liberalization of access by foreigners to the domestic equity market. This classification scheme can be applied to virtually all of the countries in our sample, and it turns out that a large number of countries experienced liberalization, although most of the liberalization occurred within a rather short period of time in the late 1980s and the early 1990s. Thus, we can associate our 5-year average growth observations with the liberalization status of the country. We separate our observations into four groups indicating whether a country was always liberalized, never liberalized, the pre-liberalization periods of countries that liberalized, and the corresponding post liberalization observations.

Instrumental variable estimates of the base line growth equations that allow the finance coefficient to vary with the country's liberalization status are shown in Table 6. Each equation shows the finance variable for all observations and then the finance variable interacted with dummies for three of the liberalization groups (the always-liberalized group is omitted). Thus, the coefficients on the interaction variables are differences in the finance effect from the effect for always-liberalized countries. The signs of the interaction coefficients offer some indication that the finance effect is larger in never liberalized countries and smaller in countries prior to liberalization, but they are never significantly different from zero. Of course, it might be difficult to identify the effect of liberalizations on the finance-growth relationship because the liberalization itself often promotes growth. Indeed, Bekaert, Harvey and Lundblad find that that equity market liberalizations increase growth rates by a full percentage point. Further, it might be hard to distinguish a liberalization effect from the effect of time since all the post-

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liberalization observations occur later in our sample and time period fixed effects are included in all of the equations. [9]

Next, equity markets have grown in size and importance around the world in just the years in which the effect of financial deepening on growth seems to have disappeared. It therefore is reasonable to suggest that equity market financing has acted as a substitute for credit market financing so that the impact of financial deepening has been mitigated in recent years by the increasing role of equity markets. The positive impact of equity markets on growth has been demonstrated with panel data sets like ours by Levine and Zervos (1998) and Rousseau and Wachtel (2000). In order to investigate this hypothesis we define a broad financing measure which is the sum of M3 and the market capitalization of the stock market as a ratio to GDP.[10] The stock market data is not widely available until the 1980s and even then is not available for every country. Nevertheless we estimated the baseline equation for the countries that were available for each cross section after 1980 with the broad financing measure. The table below shows the coefficients on the broad financing measure from each cross section with its standard error in parentheses and the number of countries. The finance effect is present though not quite statistically significant in the 1980s but disappears afterwards even when the equity and credit markets are considered together.

	1980-84	1985-89	1990-94	1995-99	2000-04
Broad finance	0.018	0.010	-0.003	-0.002	0.002
	(.013)	(.009)	(.006)	(.004)	(.005)
No. countries	39	44	51	61	45

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[9] For example, an additional explanation might be that there are distinct characteristics of the two decades, the 1970s and 1980s, that made the financial ratios seem to cause growth at that time but not otherwise. Those decades are dominated by the oil shocks and periods of high inflation in many countries. It could well be that greater financial depth is associated with growth because these countries were better able to withstand the large nominal shocks that characterized the period. This would in fact be a benefit of deeper financial institutions but would not imply that increases in financial depth cause growth.

[10] The data on stock market capitalization are from the *World Development Indicators* database and worksheets underlying Rousseau and Wachtel (2000).

The conclusion to be drawn from these tests is clear. The decline in the finance coefficients over time is not an inexplicable or transitory time effect. The coefficients are smaller in recent years because of the increased incidence of financial and banking crises. Financial deepening promotes growth as long as it is not excessive. Once excessive growth of money and credit leads to a crisis in the banking system, the benefits of financial deepening disappear until the crisis is cleaned up. The change in the finance effect is not due to liberalization as measured by financial sector openness and it is not due to the increasingly important role of equity markets.

5. Additional evidence

In this section we examine sample composition effects that might affect the relationship between finance and growth. To begin we distinguish between developed and developing countries using the World Bank's classification and estimate the baseline growth equation for each group. Table 7 shows the panel estimates for both country groups for the initial sample period (1960-89) and the subsequent period (1990-2004) with the M3 as a percentage of GDP as the finance variable. The finance effect is significant for both in the earlier period though it is larger for the developed countries. In the later period it is much smaller for the developed countries and disappears for the undeveloped countries.

The effect of both time and level of development on the finance coefficient can be related to changes in the per capita income of the countries in the sample. In order to examine this, we used a rolling regression technique to investigate the relationship between per capita income and the finance effect more closely.[11] In results not shown here, we find that for very low income countries (income below 3,000 year 2000 USD); the effect of financial deepening is positive but not significant. The effect is imprecisely estimated because in many of these countries increased financial depth might be due to

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[11] The rolling regression techniques was first applied to study of the finance-growth nexus by Rousseau and Wachtel (2002). In that paper we showed that the cross-sectional relationship between finance and growth vanished in high inflation environments.

directed finance and poor lending standards. However, in the middle income range (from $3,000 to $12,000), there seems to be clear evidence of a finance growth relationship. The relationship disappears among very high income countries. These results indicate that the finance growth nexus appears to be stronger in certain economic environments. Countries with moderately developed financial sectors or countries with middle levels of per capita income have a stronger and significant impact of financial deepening on economic growth.

We also use the rolling regression technique to investigate the relationship between the level of financial development and the impact of finance with IV panel regressions for the baseline equation and the M3 ratio as the finance variable.[12] Figure 1 shows the evolution of the finance coefficient for 20-country rolling windows; the solid line gives the estimated coefficients and 5 percent confidence intervals are given by the dotted lines. The countries are ordered by the average level of financial depth (after adjusting for global time effects) and rolled in as the ratio of M3 to GDP increases.

The initial regression includes the 20 countries with the lowest levels of financial depth and rolls in additional countries and rolls out the initial countries one by one so that each coefficient is estimated with a 20-country window. Thus, the coefficients depicted in Figure 1 reflect the effects of finance on growth among countries with relatively similar levels of financial sector development. The horizontal axis measures the average ratio of M3 to GDP among the 20 countries corresponding to each particular point estimate.

The results are striking; financial deepening matters when the M3 to GDP ratio is around the middle of the observed range (about 40%). The 20-country window that corresponds with this peak positive effect includes M3 to GDP ratios that range from 32% to nearly 60%. Among the financially less developed countries the coefficient is usually negative, is quite variable, and is imprecisely measured. Among the financially most developed countries the coefficient is about zero but rising slowly with the level of financial depth; although finance differs a lot among these countries it has little relationship to growth.

6. Conclusion

We examine the robustness of some now-classic findings on the cross-country relationship between financial development and economic growth, and found that the finance-growth relationship that was estimated with data from the 1960s to the 1980s simply disappeared over the subsequent fifteen years. One might conclude that the underlying relationship that is so widely used is simply unstable and that with additional data it might well reappear. Alternatively, we investigate some simple hypotheses that might explain the time effects.

First, we test whether the incidence of domestic banking and financial crises affects the impact of deepening. Here the evidence is very strong. Financial deepening has a strong impact on growth throughout the sample period as long as a country can avoid a financial crisis. In crisis episodes, which are more often than not due to excessive deepening, the benefits of financial deepening, not surprisingly, disappear.

Second, we test to see whether an affect analogous to the Lucas critique is at work. In the context of our problem, it would imply that financial deepening causes growth as long as the relationship is not exploited. We use international equity market opening as an indicator of liberalization and the effort to develop financial markets. We find that the effect of financial deepening does not weaken when liberalizations occur.

Third, we test to see whether the disappearance of the finance effect is due to the omission of the role of equity markets on growth. This is of particular concern because of the increasing role of equity markets in many countries in the recent years. We do not find any indication that our result is due to the absence of equity markets. Although market capitalization is not available for all of the countries in our sample, when it is included the effect of finance broadly defined still declines after the 1980s.

All of this does not detract from the basic point that at one time countries with higher levels of financial development tended to have higher growth rates than those with lower levels of financial development. The question of *how* these countries acquired large financial sectors and *how* they may have served as engines of growth, however, remains imperfectly understood. Did finance emerge due to the presence of deeper institutional fundamentals that had a direct impact on growth as Acemoglu, Johnson, and Robinson

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[12] The overall estimate for the entire sample is given in Table 1.

(2001) suggest? Or is Joan Robinson correct that growth is the prime mover behind financial development? Our study, while by no means arguing that financial factors is no longer important for economic development, serves simply as a reminder that the link between finance and growth is more complex than the simple relationships suggest. It would appear that deepening needs to be accompanied by appropriate policies for financial sector reform and regulation. Thus, the systematic study of the financial development experiences of individual countries becomes all the more critical as the next step in furthering our understanding of the nexus.

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TABLE 1

OLS Growth Regressions with Pure Cross Section Data

Dependent variable: % Growth of per capita real GDP

	1960-2004			1960-1989			1990-2004		
Log of initial real per capita GDP (2000 US$)	-0.583** (0.178)	-0.641** (0.178)	-0.611** (0.186)	-0.552** (0.181)	-0.645** (0.199)	-0.565** (0.216)	-0.041 (0.226)	-0.159 (.226)	-0.077 (0.231)
Log of initial secondary school enrollment rate	1.311** (0.389)	1.346** (0.411)	1.570** (0.347)	0.987** (0.342)	1.067** (0.359)	1.370** (0.327)	1.430** (0.462)	1.374** (0.464)	1.444** (0.417)
Initial liquid liabilities (M3) (% of GDP)	0.026** (0.009)			0.042** (0.010)			-0.003 (0.006)		
Initial M3 less M1 (% of GDP)		0.032** (0.016)			0.058** (0.017)			0.007 (0.010)	
Initial private sector credit (% of GDP)			0.013 (0.011)			0.027** (0.013)			-0.001 (0.006)
Initial government expenditure (% of GDP)	0.042 (0.053)	0.075 (0.053)	0.051 (0.046)	0.077 (0.048)	0.113** (0.051)	0.075* (0.044)	-0.123** (0.051)	-0.120** (0.055)	-0.120** (0.045)
Initial trade (% of GDP)	-0.008 (0.006)	-0.008 (0.006)	-0.002 (0.004)	-0.020** (0.009)	-0.019** (0.010)	-0.005 (0.006)	0.012* (.005)	0.009* (0.005)	0.010** (0.004)
R² (No. observations)	0.42 (77)	0.44 (70)	0.44 (83)	0.38 (75)	0.35 (68)	0.39 (80)	0.36 (74)	0.35 (70)	0.37 (83)

Notes: Coefficient estimates are from OLS regressions with standard errors in parentheses. Growth rates are averaged across each data period and all explanatory variables are measured at the start of the period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 2
Instrumental Variables Growth Regressions with 5-Year Panel Data

Dependent variable: % Growth of per capita real GDP

	1960-2004			1960-1989			1990-2004		
Log of initial real per capita GDP (2000 US$)	-0.059 (0.106)	-0.096 (0.110)	-0.026 (0.115)	-0.053 (0.128)	-0.157 (0.137)	-0.155 (0.145)	-0.164 (.207)	-0.156 (.206)	-0.069 (.206)
Log of initial secondary school enrollment rate	0.852** (0.175)	0.851** (0.179)	0.936** (0.172)	0.626** (0.197)	0.667** (0.200)	0.782** (0.194)	1.632** (0.440)	1.577** (0.455)	1.650** (0.418)
Liquid liabilities (M3) (% of GDP)	0.014** (0.004)			0.028** (0.006)			-0.001 (0.006)		
M3 less M1 (% of GDP)		0.025** (0.007)			0.046** (0.010)			0.002 (0.009)	
Private sector credit (% of GDP)			0.005 (0.004)			0.024** (0.007)			-0.005 (0.005)
Government expenditure (% of GDP)	-0.082** (0.022)	-0.074** (0.023)	-0.077** (0.022)	-0.075** (0.028)	-0.060** (0.028)	-0.062** (0.028)	-0.105** (0.039)	-0.110** (0.041)	-0.107** (0.037)
Trade (% of GDP)	0.008** (0.003)	0.007* (0.003)	0.010** (0.003)	0.004 (0.005)	0.002 (0.005)	0.009** (0.005)	0.011** (0.004)	0.012** (0.005)	0.012** (0.004)
R^2 (No. observations)	0.26 (637)	0.26 (632)	0.25 (657)	0.30 (423)	0.30 (423)	0.29 (427)	0.18 (214)	0.19 (209)	0.19 (230)

Notes: Coefficient estimates are from two-stage least squares regressions using 5-year averages of the data with standard errors in parentheses. Instruments include initial values of all right-hand side variables, with initial values taken as the first observation of each 5-year period. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 3
System GMM Growth Regressions with 5-Year Panel Data

Dependent variable: % Growth of per capita real GDP

	1965-2004			1965-1989			1990-2004		
Log of initial real per capita GDP (2000 US$)	-0.128 (0.150)	-0.121 (0.154)	-0.031 (0.164)	-0.143 (0.156)	-0.240 (0.169)	-0.103 (0.153)	-0.243 (0.265)	-0.157 (.246)	-0.040 (0.290)
Log of secondary school enrollment rate	0.687** (0.238)	0.682** (0.240)	0.720** (0.259)	0.437 (0.276)	0.421 (0.287)	0.526* (0.279)	1.708** (0.589)	1.523** (0.603)	1.651** (0.565)
Liquid liabilities (M3) (% of GDP)	0.008** (0.004)			0.028** (0.007)			0.001 (0.005)		
M3 less M1 (% of GDP)		0.013** (0.007)			0.044** (0.011)			0.004 (0.008)	
Private sector credit (% of GDP)			-0.001 (0.005)			0.017** (0.007)			-0.010* (0.006)
Government expenditure (% of GDP)	-0.055* (0.033)	-0.052 (0.032)	-0.045 (0.031)	-0.091** (0.037)	-0.076** (0.035)	-0.080** (0.033)	-0.078** (0.073)	-0.098 (0.072)	-0.092 (0.064)
Trade (% of GDP)	0.008** (0.004)	0.008** (0.004)	0.008** (0.004)	0.011* (0.006)	0.011 (0.007)	0.014** (0.006)	0.007* (004)	0.009** (0.005)	0.010** (0.004)
Hansen J-Test (p-value) (No. observations)	0.57 (576)	0.70 (571)	0.50 (595)	0.91 (363)	0.87 (363)	0.95 (366)	0.18 (213)	0.38 (208)	0.12 (229)

Notes: Coefficient estimates are from "system" GMM regressions using 5-year averages of the data with standard errors in parentheses. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 4

Summary of Instrumental Variables Growth Regressions with Individual 5-Year Cross Sections

Dependent variable: % Growth of per capita real GDP

	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Liquid liabilities (M3) (% of GDP)	-0.005 (0.019)	0.044** (0.013)	0.029** (0.013)	0.040** (0.016)	0.029* (0.015)	0.020* (0.012)	-0.000 (0.012)	-0.001 (0.008)	0.002 (0.008)
M3 less M1 (% of GDP)	-0.002 (0.030)	0.062** (0.020)	0.041* (0.022)	0.043* (0.025)	0.046 (0.031)	0.062** (0.020)	0.012 (0.021)	-0.001 (0.015)	0.003 (0.011)
Private sector credit (% of GDP)	0.009 (0.024)	0.034* (0.019)	0.024 (0.018)	0.022 (0.020)	0.011 (0.017)	0.036** (0.013)	-0.003 (0.011)	-0.005 (0.007)	0.001 (0.007)

Notes: Coefficient estimates are for the financial variables listed in the left column of the table from separate two-stage least squares regressions using 5-year averages of the data with standard errors in parentheses. The growth regression summarized in each cell includes initial income, secondary education, government expenditure, and trade as controls along with the single financial variable listed. Instruments include initial values of all right-hand side variables, with initial values taken as the first observation of each 5-year period. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 5
Instrumental Variables Growth Regressions with 5-Year Panel Data
by Crisis Status, 1960-2004

Financial Variable:	Dependent variable: % Growth of per capita real GDP		
	M3 (% GDP)	M3-M1 (% GDP)	Credit (% GDP)
Log of initial real per capita GDP (2000 US$)	-0.073 (0.105)	-0.103 (0.110)	-0.091 (0.116)
Log of secondary school enrollment rate	0.817** (0.175)	0.845** (0.179)	0.940** (0.171)
Finance	0.020** (0.004)	0.029** (0.007)	0.012** (0.004)
Finance x major financial crisis	-0.017** (0.005)	-0.020** (0.009)	-0.015** (0.005)
Finance x minor financial crisis	-0.006 (0.006)	-0.007 (0.010)	-0.008 (0.006)
Government expenditure (% of GDP)	-0.085** (0.022)	-0.078** (0.023)	-0.079** (0.022)
Trade (% of GDP)	0.006* (0.003)	0.006* (0.004)	0.009** (0.003)
R^2 (No. observations)	0.27 (637)	0.26 (632)	0.26 (657)

Notes: Coefficient estimates are from two-stage least squares regressions using 5-year averages of the data with standard errors in parentheses. Instruments include initial values of all right-hand side variables, with initial values taken as the first observation of each 5-year period. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 6
Instrumental Variables Growth Regressions with 5-Year Panel Data
by Liberalization Status, 1960-2004

Financial Variable:	Dependent variable: % Growth of per capita real GDP		
	M3 (% GDP)	M3-M1 (% GDP)	Credit (% GDP)
Log of initial real per capita GDP (2000 US$)	-0.036 (0.107)	-0.076 (0.112)	0.007 (0.117)
Log of secondary school enrollment rate	0.816^{**} (0.178)	0.837^{**} (0.180)	0.935^{**} (0.174)
Finance	0.014^{**} (0.004)	0.023^{**} (0.007)	0.005 (0.004)
Finance x never liberalized	0.005 (0.005)	0.009 (0.007)	-0.001 (0.004)
Finance x pre-liberalization	0.001 (0.006)	-0.005 (0.009)	-0.005 (0.007)
Finance x post liberalization	0.003 (0.006)	0.006 (0.008)	0.003 (0.006)
Government expenditure (% of GDP)	-0.090^{**} (0.022)	-0.081^{**} (0.023)	-0.080^{**} (0.022)
Trade (% of GDP)	0.008^{**} (0.003)	0.006^{*} (0.004)	0.010^{**} (0.003)
Exclude liberalization variables (p-value)	0.79	0.45	0.79
R^2 (No. observations)	0.26 (630)	0.27 (619)	0.25 (646)

Notes: Coefficient estimates are from two-stage least squares regressions using 5-year averages of the data with standard errors in parentheses. Instruments include initial values of all right-hand side variables, with initial values taken as the first observation of each 5-year period. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.

TABLE 7

Instrumental Variables Growth Regressions with 5-Year Panel Data
for Developed and Less Developed Countries

| | Dependent variable: % Growth of per capita real GDP | | | | | |
| | Developed | | | Less Developed | | |
	1960-2004	1960-1989	1990-2004	1960-2004	1960-1989	1990-2004
Log of initial real per capita GDP (2000 US$)	-0.426[**] (0.209)	-0.418[*] (0.254)	-0.650 (0.411)	-0.585[**] (0.210)	-0.552[**] (0.256)	-0.354 (0.392)
Log of secondary school enrollment rate	0.569[**] (0.236)	0.407 (0.267)	1.435[**] (0.625)	1.624[**] (0.333)	1.447[**] (0.371)	2.371[**] (1.075)
Liquid liabilities (M3) (% of GDP)	0.035[**] (0.010)	0.045[**] (0.017)	0.019 (0.014)	0.008[**] (0.004)	0.019[**] (0.005)	-0.006 (0.005)
Government expenditure (% of GDP)	-0.112[**] (0.036)	-0.103[**] (0.047)	-0.127[*] (0.070)	-0.068[**] (0.030)	-0.067[*] (0.040)	-0.122[**] (0.048)
Trade (% of GDP)	-0.001 (0.006)	-0.006 (0.008)	0.004 (0.008)	0.013[**] (0.004)	0.013[**] (0.006)	0.016[**] (0.005)
R2 (No. observations)	0.21 (360)	0.24 (238)	0.17 (122)	0.32 (277)	0.36 (185)	0.22 (92)

Notes: Coefficient estimates are from two-stage least squares regressions using 5-year averages of the data with standard errors in parentheses. Instruments include initial values of all right-hand side variables, with initial values taken as the first observation of each 5-year period. The regressions include a dummy variable for each time period. The symbols ** and * indicate statistical significance at the 5% and 10% levels.
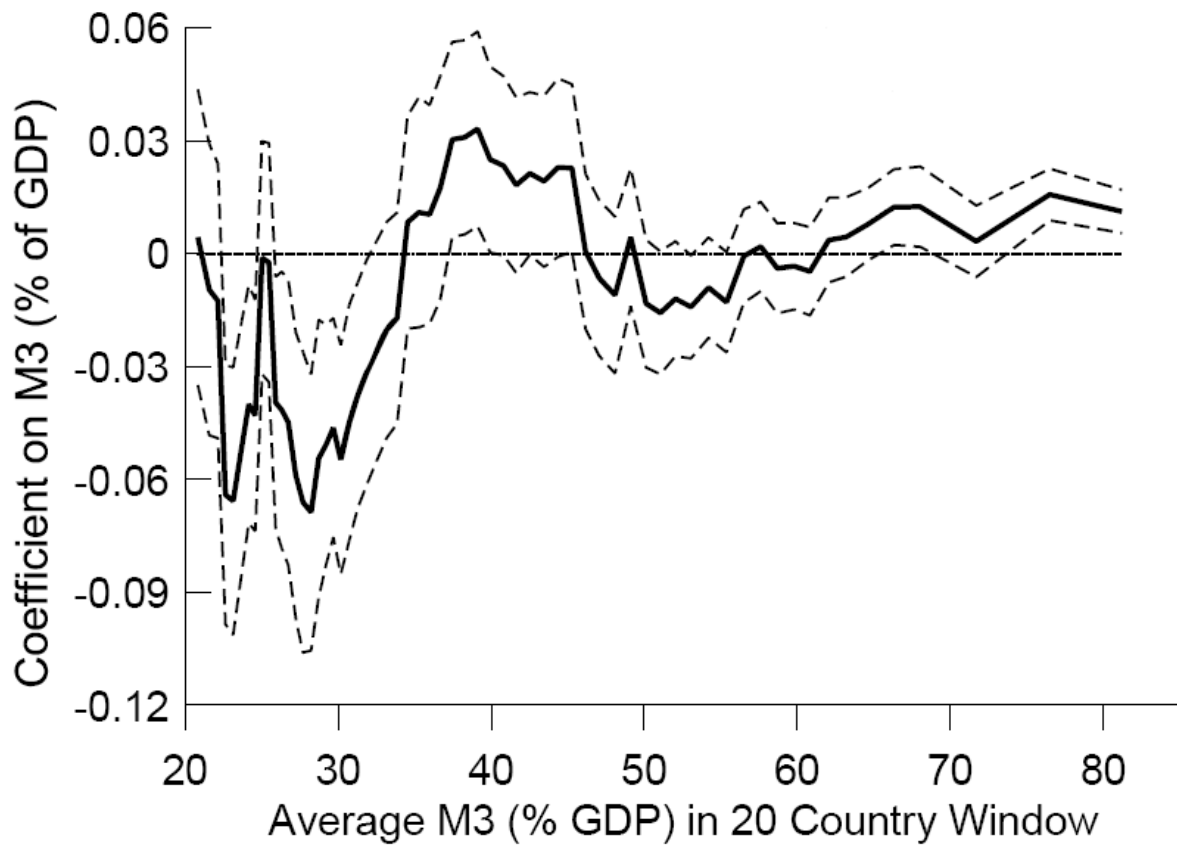
Fig. 1. Evolution of finance coefficients in rolling 20-country window ordered by increasing M3 (% GDP), 1960-2004