

# Chicago Fed Letter

## The role of financial services in economic growth

by Nicola Cetorelli

Academics and policymakers have shown an increasing interest in the role that a well-developed financial sector might play in defining a path of economic development characterized by sustainable, long-run economic growth. Theoretical modeling has suggested the importance to growth of a highly developed banking industry and capital markets. Extensive empirical evidence has corroborated this hypothesis. The research focus is now directed toward a deeper understanding of the *mechanics* of the relationship between financial development and economic growth. In other words, which characteristics of the financial industry seem to have an impact on capital accumulation? What is the role of the regulatory environment in which banks and capital markets operate? How does the quality of law enforcement, reflected in protection of creditors and property rights, affect the role played by banks and capital markets? How does the level of efficiency of these segments of the financial sector affect firms' access to investment funds and, therefore, capital accumulation? Finally, does it matter if banks are privately owned or government owned?

In this *Chicago Fed Letter*, I present empirical evidence on these issues. While the above questions have been asked before, I believe this is the first article to offer a broad, panoramic view of this important topic of research.<sup>1</sup> Overall, I find evidence of stronger growth in countries characterized by a good legal structure, a less restrictive banking regulatory regime, efficient banks and capital markets, and a low degree of government ownership in banking.

The empirical exercise proceeds in two steps. First, I measure the relationship between the growth rate and indicators of legal quality, banking regulatory restrictions, bank and capital market efficiency, and government ownership in banking for a set of countries from 1980 to 1990. This is the standard approach followed in most studies, beginning with the seminal work by King and Levine (1993). Second, I adopt a methodology used by Rajan and Zingales (1998), which measures the effects of the above-mentioned financial characteristics on the growth rates of a number of different industrial sectors *within* each country.

### Country growth rates and financial sector characteristics

I obtain the first set of results by estimating regressions based on the model in figure 1. Column 1 reports the results of a first regression, where the level of development of the credit industry is captured by total domestic credit to the private sector over gross domestic product (GDP), while the level of activity in the capital markets is captured by total stock market capitalization over GDP. If the development of either sector of the financial industry is important for overall industry growth, then we should find a positive and statistically significant coefficient associated with the two measures, indicating that countries with higher levels of financial development also display, on average, higher levels of growth. This is confirmed by the results in column 1. For example, the regression results suggest that a country whose level of bank development in 1980 was in the top quartile of the cross-country distribution would have experienced a 2% higher yearly average industry growth rate than a country with a level of bank development in the lowest quartile. This is a potentially large contribution to growth.

I now explore the role of some of the financial sector's most important characteristics. First, I look at the legal environment financial markets operate in. I use two common measures. The first is an index of the quality of accounting standards, computed for each country by the Center for International Financial Analysis and Research (CIFAR). This composite indicator reflects the standards of disclosure of firms' annual reports (for more details, see Rajan and Zingales, 1998). The poorer such standards, the more difficult it would be for a firm to raise external finance on capital markets. This should translate into a higher information cost that a supplier of funds (such as a bank) has to sustain to determine the quality of an entrepreneur. All else equal, if financial markets have a positive role in enhancing capital accumulation, we would expect a noticeably stronger impact in countries with better accounting standards. The results in column 2 are consistent with this prediction, as the coefficient for the accounting standard index is positive and significant.

The second measure of the quality of the legal environment is a more general index of the efficiency and integrity of the legal system, computed by Business International Corporation (see Rajan and Zingales, 1998). This index gives an indication of the extent to which laws are enforced. In general, a lower ranking will imply higher transaction costs and, consequently, lower efficiency of financial markets. The expectation, therefore, is that countries with a higher quality legal system should experience faster growth. The results in column 3 confirm this. Notice that in this regression, the coefficient of accounting standards loses significance. This is presumably due to some degree of collinearity with the quality of law index. Indeed, the correlation between the two measures, (not shown in the figure), is above 0.5 and highly significant.

## 1. Financial characteristics and industry growth

The results below are based on the following model specification:

$$Growth_{j,k} = Constant + A \times \text{Industry Indicator Variables}_j + B \times \text{Country Controls}_k + \alpha \times \text{Share of total value added}_{j,k} + \Lambda \times \text{Financial Characteristics}_k + Error_{j,k}$$

	1	2	3	4	5	6
Bank size	0.081***	0.091***	0.060***	0.059***	0.041***	0.052**
Market capitalization	0.025***	0.016**	0.027***	0.027***	0.014*	-0.021
Accounting standards		0.070***	0.032	0.030	-0.004	-0.02
Rule of law			0.013***	0.013***	0.011***	0.004*
Bank powers				-0.001	0.003	0.014**
Bank efficiency					-0.003	0.006*
Market trading volume					0.042***	0.105**
Government-owned banks						0.014
R <sup>2</sup>	0.13	0.19	0.26	0.26	0.27	0.19
Observations	1,150	984	984	984	966	617

Notes: The dependent variable is 1980–90 growth in value added for each of 41 manufacturing sectors  $j$  in 36 countries  $k$  (both developed and developing countries). The indicator variables control for sector-specific factors that may affect industrial growth; the country controls include the logarithm of GDP per capita and the fraction of total manufacturing value added of each sector in each country in 1980. The estimated coefficients of these variables as well as those of the industry indicators are not reported. \*\*\*, \*\*, and \* indicate statistical significance, respectively, at the 1%, 5%, and 10% level, based on heteroscedasticity-robust standard errors.

Next, I explore the role of the regulatory environment affecting the operation of the banking industry, using Barth, Caprio, and Levine's (1999) cross-country indicator of restrictions on banks' operating activity.<sup>2</sup> Their indicator signals whether banks in a country can, for example, be active in the securities, insurance, or real estate markets, and whether banks can own or control non-financial firms (and vice versa). We might expect that where banks face greater restrictions in their potential range of activities, credit may be poorly allocated and/or less credit may be available to entrepreneurs. This would imply that in a more restrictive regulatory environment, a country may experience slower growth. However, my results (column 4) do not support this prediction. While the coefficient on banking restrictions is negative (a higher index means stricter restrictions), it is not statistically significant from zero.

I pointed out above that a poor system of law or a heavily regulated banking industry may affect banks' and capital markets' degree of efficiency and through

this channel the ability of the financial industry to promote capital accumulation and growth. Now, I test directly the effect of efficiency in the banking sector or capital markets on growth in non-financial industries. Column 5 in figure 1 shows the results of a regression that includes a common proxy for the efficiency of a country's banking sector, measured by the average interest rate margin that banks in that country charge to their clients. I also include an indicator of the volume of trade in stock markets, which is commonly considered an indicator of efficiency of capital markets.<sup>3</sup> The result does not indicate a significant effect for the margins variable, while there is stronger evidence that industries do grow more, all else equal, in countries where capital markets promote a higher level of trading activity.

Finally, I investigate the importance of government ownership in the banking industry. Recent research has pointed out that government-owned financial institutions may be less efficient than privately owned institutions.<sup>4</sup> Column 6 shows the results of a regression in

which the share of total bank assets that are government owned is included as a proxy of the relative degree of importance of government ownership (see Demirgüç-Kunt and Levine, 1999). As the results indicate, the coefficient of the state variable is not significant, hence it does not provide evidence consistent with the hypothesis of a negative role played by a government active in the credit industry.

### A better identification strategy

The above regression analysis highlights some significant associations between financial industry characteristics and growth in nonfinancial sectors. However, while extremely popular, the specification model in figure 1 is usually criticized because it may be exposed to an *omitted variable bias* and it is hard to rule out the possibility of *reverse causality*. For practical reasons (e.g., lack of data or limits on degrees of freedom), the vector of country controls will always omit some variables, thus raising the concern that the estimated coefficient of the included regressors may be biased (this would explain, for example, the observed instability of some of the estimated coefficients across the regressions of figure 1). Also, with a cross-sectional regression it is hard to make the case for causality clearly running from the right-hand-side regressors to the left-hand-side dependent variable. In other words, we cannot be sure whether industrial growth is spurred on by a well-developed financial industry, or whether a country with significant growth potential, or that has already experienced fast growth, attracts the establishment and development of banks and capital markets. (Rajan and Zingales, 1998, clearly summarize these issues.)

An alternative approach that is less exposed to these potential problems exploits information on specific characteristics of industrial sectors. As Rajan and Zingales (1998) pointed out, industrial sectors differ from one another for sector-specific reasons (e.g., technology) in terms of their firms' degree of dependence on external sources of finance. For instance, firms in a sector such as leather or tobacco will typically generate larger amounts of cash flow that could be used to finance investment than firms in sectors such as pharmaceuticals

## 2. Within-industry effects of financial characteristics

The results below are based on the following model specification:

$$Growth_{j,k} = Constant + A \times \text{Industry Indicator Variables}_j + B \times \text{Country Indicator Variables}_k + \alpha \times \text{Share of total value added}_{j,k} + \gamma \times \text{External Financial Dependence}_j \times \text{Financial Characteristics}_k + \text{Error}_{j,k}$$

	Effect on industry growth of								
	Bank size	Market capitalization	Total financial development	Accounting standards	Rule of law	Bank powers	Bank efficiency	Market trading volume	Government-owned banks
Coefficient $\gamma$	0.127***	0.061**	0.07***	0.135***	0.004**	-0.02**	-0.005*	0.094***	-0.075***
R <sup>2</sup>	0.29	0.28	0.29	0.42	0.34	0.38	0.33	0.28	0.23
Observations	1,150	1,150	1,150	984	1,085	1,035	1,071	1,140	741

Notes: The reported coefficients  $\gamma$  are those of the interaction term between external financial dependence and the financial variable in each column. The dependent variable is 1980–90 growth in value added for each of 41 manufacturing sectors  $j$  in 36 countries  $k$  (both developed and developing countries). The indicator variables control for industry-specific or country-specific factors that may affect industrial growth. The estimated coefficients of these indicator variables, as well as that of the share of total manufacturing value added, are not reported. \*\*\*, \*\*, and \* indicate statistical significance, respectively, at the 1%, 5%, and 10% level, based on heteroscedasticity-robust standard errors.

or computers. Then, if financial development affects industry growth because it allows firms to have better access to investment funds, firms in sectors that are highly dependent on external finance should grow much faster in countries with a more developed financial sector than the same types of firms in less developed economies.

This empirical exercise is based on the model in figure 2. The effects of the characteristics of the financial industry are captured by the estimated coefficient of the term of interaction between the degree of external financial dependence of an industrial sector with each of our financial variables (first row in figure 2). With this identification strategy, it is possible to include vectors of both industry and country indicator variables, which absorb the effect of any sector- or country-specific factors affecting industry growth. (The country indicator variables substitute for the vector of country controls used in figure 1.) This is the most effective way to deal with the omitted variable issue mentioned above. This identification strategy is also less exposed to the issue of reverse causality, in that it is based on specific mechanisms through which those financial characteristics should have an impact on industry growth. If, for example, bank efficiency implies lower cost of credit to entrepreneurs and higher quantity of funds available, then firms in sectors that are especially dependent on bank credit will benefit disproportionately more from being in a country with higher bank efficiency. The direction of

causality would be reversed if, instead, the development of the financial sector were due to growth in industries that are especially dependent on bank finance. While this is possible, it is much less likely. The results in figure 2, therefore, should be interpreted as more robust than those yielded by the simpler cross-country regressions.

I begin with a regression where the external financial dependence of an industry sector is interacted with the level of bank development (called “bank size” in the figure) of a country. The positive and significant coefficient is evidence consistent with the hypothesis that bank development matters for growth: Firms in sectors that depend more than others on external sources of finance (banks and capital markets) for their investment projects are shown to grow faster in countries with a more developed banking industry. In column 2, the interaction term is with the level of stock market capitalization. Applying the same reasoning to interpret this result, the positive and significant coefficient of the interaction term confirms the important role of capital markets for growth. Likewise, the overall importance of financial development is captured by the significant coefficient of the interaction with the aggregate indicator, the sum of total domestic credit and total market capitalization (column 3).

Continuing in the same fashion as in figure 1, I now analyze the importance of the legal environment. In column 4,

I have interacted the level of external finance of each industry sector with the indicator of accounting standards, which displays a positive and significant coefficient. The important role played by a functioning legal system is confirmed by the regression in column 5, where the interaction with the indicator of the rule of law is also positive and significant.

Next, column 6 in figure 2 shows the results of a regression where the interaction is with the indicator of bank regulatory restrictions. With the standard cross-sector specification, I do not find evidence of a significant role played by the regulatory environment banks

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operate in. Adopting this alternative specification, however, I observe that firms in sectors more dependent on external finance grow less in countries with a more restrictive banking environment (column 6). This would be consistent with the hypotheses discussed above, that where banks face more restrictions in their potential range of activities, credit may be poorly allocated and/or less credit may be available to entrepreneurs, thus dampening the growth potential of those sectors that rely more heavily on bank credit.

Next, I again explore the role of the two variables proxying for the level of efficiency of banks and capital markets. The results are presented in columns 7 and 8, respectively. While the cross-section regressions above indicated a non-significant effect of the level of bank efficiency, the new regressions indicate that both an efficient banking industry and capital markets have a growth enhancing effect. Finally, column 9 presents the result of a regression where external financial dependence is interacted with the variable measuring the importance of government-owned banks. Although the cross-section regression had not indicated any significant effect

on growth associated with a heavy government presence in the banking sector, the results of the alternative model specification are consistent with a negative role of government-owned banks. Firms in highly dependent sectors grow less in countries where the government has a more important presence in the banking industry.

### Conclusion

This empirical exercise provides evidence on the role of specific characteristics of the financial industry in economic growth. Specifically, my results indicate the importance of the sophistication of the legal environment, the banking regulatory regime, the level of efficiency of both banks and capital markets, and the degree of government ownership in banking to growth in industry sectors and the overall economy.

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<sup>1</sup>For general reference, see Robert King and Ross Levine, 1993, "Finance and growth: Schumpeter might be right," *Quarterly Journal of Economics*, Vol. 108, No. 3, pp. 717-737; Asli Demirgüç-Kunt and Vojislav Maksimovic, 1998, "Law, finance, and firm growth," *Journal of Finance*, Vol.

53, No. 6, pp. 2107-2137; Ross Levine and Sara Zervos, 1998, "Stock markets and economic growth," *American Economic Review*, Vol. 88, No. 3, pp. 537-558; Raghuram Rajan and Luigi Zingales, 1998, "Financial dependence and growth," *American Economic Review*, Vol. 88, No. 3, pp. 559-586; and Nicola Cetorelli and Michele Gambera, 2001, "Banking market structure, financial dependence, and growth: International evidence from industry data," *Journal of Finance*, Vol. 56, No. 2, pp. 617-648.

<sup>2</sup>James R. Barth, Gerard Caprio, and Ross Levine, 2000, "Banking systems around the world: Do regulation and ownership affect performance and stability?," in *Prudential Supervision: What Works and What Doesn't*, Frederic Mishkin (ed.), Cambridge, MA: NBER Press.

<sup>3</sup>The source for both indicators is Asli Demirgüç-Kunt and Ross Levine, 1999, "Bank-based and market-based financial systems: Cross-country comparisons," World Bank, working paper.

<sup>4</sup>See, e.g., Paola Sapienza, 1999, "What do state-owned firms maximize? Evidence from the Italian banks," Northwestern University, mimeo; and Rafael L. La Porta, Florencio Lopez-De-Silanes, and Andrei Shleifer, 2001, "Government ownership of banks," Harvard University, mimeo.

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