ARTURO GALINDO
ALEJANDRO MICCO
GUILLERMO ORDOÑEZ

# Financial Liberalization: Does It Pay to Join the Party?

Financial repression leads to segmented domestic financial markets in which some obtained credit (rationing) at very negative real interest rates, while non-favored borrowers had to obtain funds in expensive and unstable informal credit markets. Public controls over the banking system typically led to negative real interest rates for depositors. Financial repression became an obstacle to domestic savings and their efficient allocation, and financial intermediation languished.

—Carlos Díaz-Alejandro

Financial liberalization is a highly controversial policy. Despite the fact that almost all the regions of the world have undergone liberalization of their financial markets, its effect on the performance of different economic sectors remains a question. In our research, we find that financial liberalization reduces the cost of capital, boosting the relative growth rates of economic sectors that for technological reasons rely heavily on external (to the firm) finance. This result, however, depends on the quality of institutions supporting credit markets. The effects of financial liberalization are more notable in countries that have and enforce regulations to protect property rights. In this sense, the answer to the question in the title of the paper is not clear-cut. The impact of financial liberalization on growth depends on underlying institutional factors.

This paper interprets financial liberalization as the removal of restrictions that impede the free allocation of resources on two fronts: the domestic financial system and the capital account. Liberalization policies

Galindo, Micco, and Ordoñez are with the Research Department of the Inter-American Development Bank (IDB).

We thank Graciela Kaminsky and Sergio Schmukler for sharing their data with us. We also thank Arturo Bris, Bill Easterly, Florencio López-de-Silanes, Andrea Repetto, and Andrés Velasco for useful comments and suggestions. The opinions in this paper are our own and do not necessarily reflect those of the Inter-American Development Bank.

affecting the former include the removal of interest rate controls (lending and deposits), directed credit policies, and limitations on foreign currency deposits and foreign ownership. Policies affecting the latter contemplate the removal of restrictions on corporate borrowing abroad and the dismantling of multiple exchange rate mechanisms and capital controls. We use Kaminsky and Schmukler's dataset to quantify the degree to which countries have liberalized their financial markets on these two fronts, and we estimate the resulting effects on growth.[1]

Theory provides no straightforward answers on how liberalization is related to economic performance. Models of perfect markets in the tradition of Goldsmith, McKinnon, and Shaw suggest that removing restrictions on interest rates and credit controls can increase savings, expand the size of credit markets, and improve the efficiency with which funds are intermediated.[2] Through these mechanisms, liberalization can promote growth by effectively reducing the cost of funds for firms.[3]

Other forms of financial market liberalization can also be beneficial for economic performance. Removing restrictions that limit the use of foreign capital, such as allowing foreign players to invest in the financial system or lifting controls that prevent firms from tapping international capital markets directly, can significantly increase the size and efficiency of markets, while effectively reducing the cost of funds. Here again, such mechanisms promote growth.[4] Financial liberalization can also improve corporate governance, because foreign competition pressures local firms to adopt international accounting and regulatory standards. These improvements reduce agency costs that make it harder and more expensive for firms to raise funds in both the banking sector and the securities market.[5]

1. The dataset is from Kaminsky and Schmukler (2001).

2. Goldsmith (1969); McKinnon (1973); Shaw (1973).

3. On the relationship between increasing the size and efficiency of financial markets and growth, see King and Levine (1993) and Beck, Levine and Loayza (2000) for cross-country evidence, and see Rajan and Zingales (1998) for cross-industry, cross-country evidence. On the relationship between financial liberalization and efficiency, see Galindo, Schiantarelli, and Weiss (2002).

4. Foreign competition increases the efficiency of the domestic banking industry (see Claessens, Demirgüç-Kunt, and Huizinga, 2001; Klenow and Rodríguez-Clare, 1997). Access to foreign financial markets reduces the cost of capital to domestic firms, leading to higher investment and growth (Bekaert, Harvey, and Lundblad, 2001; Bekaert and Harvey, 2000; Henry, 2000a and 2000b).

5. For related discussions, see Claessens, Demirgüç-Kunt, and Huizinga (2001); Stulz (1999); Moel (2001).

At the same time, there are strong arguments against the growth-promoting effects of financial liberalization. Some authors claim that the efficient-markets paradigm, on which most arguments in favor of liberalization are built, is misleading when applied to the financial sector, particularly to capital flows. Removing one distortion may not be welfare-enhancing when other distortions are present. Financial markets are characterized by serious problems of asymmetric information and moral hazard, which may undermine the case for domestic financial liberalization.[6] Such considerations lead Stiglitz, for example, to argue in favor of certain forms of financial repression.[7] He claims that repression can have several positive effects, such as improving the average quality of the pool of loan applicants by lowering interest rates; increasing firm equity by lowering the price of capital; and accelerating the rate of growth if credit is targeted toward profitable sectors such as exports or sectors with high technological spillovers.

Finally, liberalization has also been linked to market segmentation and macroeconomic instability.[8] The financial reforms carried out in several Latin American countries in the 1970s were aimed at ending financial repression, yet they led to financial crises characterized by widespread bankruptcies, massive government interventions, nationalization of private institutions, and low domestic saving.[9] In a recent paper, Demirgüç-Kunt and Detragiache show that countries that have liberalized their financial sectors are more likely to run into banking crises than those that have not, depending strongly on the quality of institutions prevalent at the time of liberalization.[10]

Despite the conflicting views on the effects of financial liberalization, many countries have liberalized their financial systems, in different ways and with different results (see figure 1). Most regions of the world, except Latin America, have witnessed a continuous and gradual liberalization

6. See Stiglitz (2000).

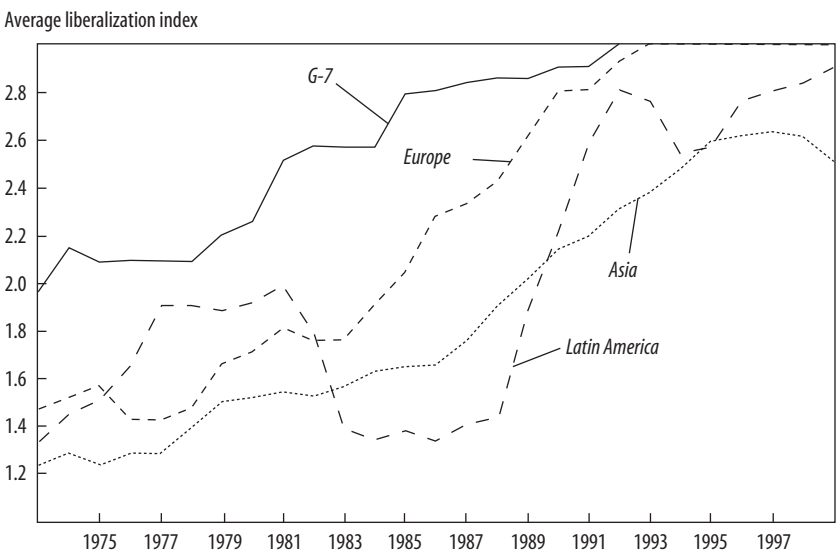
7. Stiglitz (1994).

8. Some economists hold that capital account liberalization allowing firms to list abroad leads to market fragmentation, reduces liquidity in the domestic market, and inhibits its development. See Moel (2001).

9. Díaz-Alejandro (1985).

10. Demirgüç-Kunt and Detragiache (1998). In a related paper, Stiglitz (2000) argues that in countries in which the capacity to honor contracts and to assemble information relevant to financial transactions is least advanced, there can be no presumption that capital will flow into uses for which its marginal product exceeds the opportunity cost.

**FIGURE 1. Financial Liberalization across Regions[a]**




a. Financial liberalization is based on the indicators developed in Kaminsky and Schmukler (2001). We take the simple average of liberalization in the capital account, the domestic financial system, and the stock market. This measures ranges from 1 to 3, with 3 representing full liberalization. Details on the construction of the index are in the data appendix. The average liberalization index is the simple average of the liberalization measure across countries in each year.

process. The Latin American experience with financial liberalization, however, distinctly reflects the conflicting views found in the literature. In response to the adverse effects of financial restrictions, many Latin American countries engaged in rapid liberalization strategies in the mid-1970s. This push was mainly driven by the Southern Cone countries, which pursued laissez-faire financial policies mainly supporting unrestricted private participation in financial markets without direct government regulation. As noted by Díaz-Alejandro, this led to massive bankruptcies and a generalized financial crisis throughout the region.[11] Countries then reversed their strategy, abandoning laissez-faire practices and introducing tighter regulations and restrictions to their financial systems. This came with a de facto nationalization of the banking sector. In the early 1990s, Latin America again took up the liberalization strategy. The main difference with respect

11. Díaz-Alejandro (1985).

to the previous wave of liberalization was the implementation of regulatory and supervisory mechanisms to head off the previous type of crisis.

The fact that many countries have engaged in liberalization policies despite the risks associated with them reveals that policymakers tend to expect some positive outcome. Until now, though, empirical research has not provided conclusive results on how liberalization affects economic performance. The first reason for this disappointing outcome is the lack of good, homogeneous measures of financial liberalization policies across countries and over time.[12] A second serious issue in virtually all studies of financial liberalization is the omitted variable problem, as the financial liberalization process tends to be a single aspect of a large package of reform policies. According to Fry, the simultaneity of reforms appears binding for researchers: "most clear-cut cases of financial liberalization were accompanied by other economic reforms (such as fiscal, international trade, and foreign exchange reforms). In such cases it is virtually impossible to isolate the effects of financial components of the reform package."[13] Empirical work that does not effectively control for other accompanying policies cannot draw conclusions about the impacts of financial liberalization.[14] Trade liberalization and the privatization of state enterprises, for example, have coincided with the liberalization of the financial sector in many countries. Once again, Latin America is a clear example of this (see figure 2).

This paper employs a dual strategy for dealing with these issues. First, we draw on our access to precise policy measures of financial liberalization.[15] Second, we extend the methodology developed by Rajan and

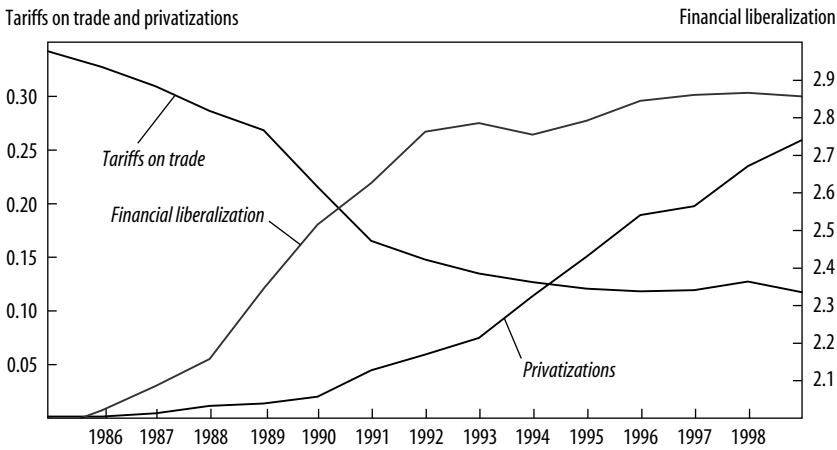
12. Lanyi and Saracoglu (1983), Fry (1978), and Roubini and Sala-i-Martin (1991) use negative levels of real interest rates as a proxy for financial repression. De Gregorio and Guidotti (1993) criticize this proxy and use credit to the private sector as a share of gross domestic product (GDP) to proxy liberalization. Few papers use policy measures; examples of this approach include Bekaert, Harvey, and Lundblad (2001); Laeven (2000); Galindo, Schiantarelli, and Weiss (2001).

13. Fry (1995, p. 179).

14. Bekaert, Harvey, and Lundblad (2001), as well as Galindo, Schiantarelli, and Weiss (2001), try to isolate the impact of financial liberalization by controlling for other reforms and macroeconomic events occurring simultaneously. While this allows some identification, it remains unclear whether the set of controls is large enough to isolate the effect of financial reform.

15. Kaminsky and Schmukler (2001) compile a homogeneous dataset incorporating several dimensions of financial liberalization for twenty-eight developed and developing countries from 1973 to 2001. Their data are ideal not only for analyzing whether liberalization

**FIGURE 2. Financial Liberalization across Regions[a]**




Source: Lora (2001); World Bank (2001).

a. For details on the financial liberalization measure, see the note to figure 1. Privatizations are measured as the cumulative value of sales and transfers of public companies as a proportion of GDP for each year. Tariffs on trade refer to the average tariff.

Zingales in such a way that we can identify the impact of financial liberalization in the context of multiple reforms.[16] Using this methodology and data—together with a time series of cross-industry, cross-country data—we explore the impact of financial liberalization on economic performance, study which forms of liberalization appear to have the greatest effects, analyze how liberalization policies can have different effects depending on the quality of the underlying institutions that prevail in each country, and explore the mechanisms through which financial liberalization operates.

The rest of the paper is organized as follows. The next section presents the data and the econometric framework. We then discuss the evidence on the impact of financial liberalization on growth and explore the relationship between liberalization and financial sector development. A final section concludes.

is valuable for financial development and growth, but also for providing specific policy recommendations.

16. Rajan and Zingales (1998).

## Empirical Method and Data

Estimating the impact of financial liberalization in a context of multiple reforms is a challenging task. Additional identification conditions are needed to determine the specific impact of financial liberalization as opposed to other simultaneous reforms. To do this, we presume that because financial liberalization promotes the development and efficiency of the financial system, it reduces the cost of external funds faced by firms.[17] The impact of financial liberalization therefore differs according to each firm's need for external funds. Firms that rely extensively on external funds will benefit more from financial liberalization than those that require little capital. We base our analysis on the requirements for external finance (the difference between investment and operating income) of several industries at the three- and four-digit levels of the International Standard Industrial Classification (ISIC).[18]

Using this identification technique, we estimate whether financial liberalization affects industry growth by interacting measures of financial liberalization with the proxy for industry demand for external funds in a cross-country, cross-industry time-series growth regression, controlling for country-time-specific and country-industry-specific characteristics. Controlling for these specific factors significantly reduces the omitted variable problem. Moreover, by estimating the interactive term, we can fully isolate the impact of financial liberalization from other events that can occur simultaneously.

We estimate the following empirical model using time series of cross-industry, cross-country data:

$$\text{GROWTH}_{ijt} = \alpha_0 + \alpha_1 \text{SHARE}_{ijt-1} + \alpha_2 \text{FINLIB}_{it} * \text{REQ}_j + \mu_{ij} + \lambda_{it} + \varepsilon_{ijt}, \quad (1)$$

17. Rajan and Zingales test whether financial development fosters growth. Their assumption is that financial development can have an impact on firms that require external capital, by reducing problems associated with moral hazard and adverse selection. Implicitly, this is a second stage in our argument, once liberalization has led to financial development.

18. Given that the U.S. market is relatively frictionless, we assume that such technological demands for external capital would apply in other countries once market distortions are removed.

where the dependent variable is the growth rate of real value added of sector $j$ in country $i$ at time $t$, $SHARE_{ijt-1}$ is the share of industry $j$ in country $i$ of total value added in manufacturing at the beginning of the period, $FINLIB_{it}$ is the measure of financial liberalization of country $i$ at time $t$ (in some regressions we use financial development to replicate previous studies), and $REQ_j$ is the requirement of industry $j$ for external funds. Additionally we include $\mu_{ij}$, a country-industry fixed effect, and $\lambda_{it}$, a country-year effect.[19] Finally, $\varepsilon_{ijt}$ is the error term. Our test of how financial liberalization affects growth is mainly on the size and significance of $\alpha_2$.

This methodology is very clean, in the sense that the inclusion of country-year effects corrects for other types of events possibly correlated with financial liberalization, such as the general liberalization trend in Latin America during the 1990s. When combined with the interaction of financial liberalization with the external dependency measure, the methodology allows for a full identification of financial liberalization's contribution to sectoral growth.

Our sectoral value added data come from the United Nations Statistical Division and cover the twenty-eight countries for which Kaminsky and Schmukler have information on financial liberalization for the period 1972–98.[20] The measure of sectoral dependence on external financing is taken from Rajan and Zingales.[21] We thus cover a total of thirty-seven industries in twenty-eight countries for twenty-seven years.

## Financial Liberalization and Growth

Table 1 reports a first set of results on how financial liberalization affects growth. The first column reports results on the impact of financial development, as in previous studies. In keeping with this literature, our measure of financial development is the ratio of private credit to gross domestic product (GDP). We find that sectors with higher external dependency grow faster in countries that have a well-developed financial sector. The sign of the coefficient is positive and significant. The line at the bottom of the table, labeled differential in growth, shows the impact on growth dif-

19. The country-industry fixed effect allows industry shares to differ across countries in the long run. Results are qualitatively the same if we use only the industry fixed effect.

20. Kaminsky and Schmukler (2001).

21. Rajan and Zingales (1998).

**TABLE 1. Financial Development, Financial Liberalization, and Industry Growth[a]**

| *Explanatory variable* | *(1)* | *(2)* | *(3)* |
|---|---|---|---|
| Industry's share in $t-1$[b] | −3.766 (0.551)*** | −3.722 (0.539)*** | −3.723 (0.539)*** |
| Credit to private sector * External dependence | 0.107 (0.032)*** | | |
| Total liberalization * External dependence | | 0.036 (0.011)*** | |
| Domestic financial system liberalization * External dependence | | | 0.033 (0.013)*** |
| Capital account liberalization * External dependence | | | 0.003 (0.011) |
| Differential in growth[c] | 1.60 | 1.33 | 1.33 |
| *Summary statistic* | | | |
| No. observations | 18,344 | 19,546 | 19,546 |
| No. counties | 27 | 28 | 28 |
| Country-year dummies | Yes | Yes | Yes |
| Country-industry dummies | Yes | Yes | Yes |

*** Significant at 1 percent.

a. The dependent variable is the annual real value added growth for each ISIC industry, in each country and in each year. Credit to the private sector is as percentage of GDP. Total liberalization is measured as the average of domestic financial system, stock market, and capital account liberalization. Domestic financial system liberalization is measured as the average of domestic banking system and stock market liberalization. All variables are interacted with industries' external financial requirements (external dependence). The financial development impact considers only twenty-seven countries because we do not have data on credit over GDP for Taiwan (see data appendix). Errors are measured considering clusters by country and industry; this was done following Bertrand, Duflo, and Mullainathan (2002) to correct the bias in the estimated standard errors that serial correlation introduces. Standard errors are reported in parentheses.

b. The industry's share of total value added in manufacturing in year $t-1$.

c. Differential in real growth rate measures (in percent) how much faster an industry at the seventy-fifth percentile level of external dependence grows with respect to an industry at the twenty-fifth percentile level when it is located in a country at the seventy-fifth percentile of financial development rather than in one at the twenty-fifth percentile.

ferentials across sectors and countries. For example, the differential in column 1 is 1.60. This should be interpreted as follows: the relative growth rate of an industry in the seventy-fifth percentile of external requirements relative to an industry in the twenty-fifth percentile, in a country with high financial development (in the seventy-fifth percentile of financial development), is 1.60 percentage points higher than that in a country with a weak financial sector (in the twenty-fifth percentile). These are large numbers considering that the average rate of real growth in the sample is around 5.1 percent and that the median is 3.8 percent. These results are similar to those in the literature.[22]

22. The equivalent differential in growth in the case of Rajan and Zingales is 1.1, with a mean of 3.4 percent of industry's real growth in their sample. For robustness, we employ an alternative measure of financial development that recognizes that the impact of develop-

The basic results of this paper are presented in column 2, which reports the results of exercises using the financial liberalization measure instead of financial development as a regressor. These results suggest that financial liberalization boosts growth in sectors with higher external dependence: after liberalization takes place, industries that depend more on external financing (seventy-fifth percentile) grow 1.33 percent faster than industries with low dependence on external financing. In other words, firms that depend on external funds will grow relatively faster than firms that do not after the country eliminates capital controls and multiple exchange rates; allows the firms to borrow abroad; eliminates interest rate controls (lending and deposits) and other restrictions such as directed credit policies or limitations on foreign currency deposits; allows foreigners to own domestic equity; and eliminates restrictions on repatriation of capital, dividends, and interest. Once again, this figure is very significant given the average values of sectoral growth in our sample.[23]

To identify the mechanism through which financial liberalization boosts growth, we break down our measure into two components, the liberalization of the domestic banking system and stock market and the liberalization of the capital account. As shown in column 3, we find that the liberalization of domestic financial markets is the key component of the impact of liberalization on growth; capital account liberalization appears to have very little impact on the growth rate of sectors that are intensive in their use of external finance.

To obtain the long-run effect of financial liberalization, we divide the estimated coefficient for financial liberalization by the absolute value of the lagged sector-share coefficient.[24] The results (in column 2) suggest that in the long run after liberalization takes place, the share of industries that depend more on external financing (at the seventy-fifth percentile level) will be 0.35 percent higher than that of industries that are less externally dependent (at the twenty-fifth percentile level). This is an important effect if we consider that the average sector-share in our sample is 3.3 percent.

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ment on growth is not instantaneous. Using this moving average of the past three years of the financial development measure yields results that are qualitatively the same.

23. As robustness checks, we allow for different lag structures of the financial liberalization measures and also different constructions of the liberalization variable (principal components). Results are qualitatively the same.

24. It is important to note that in this setup we do not require the absolute value of the coefficient in the sector share lag to be smaller than one to have stability.

As already mentioned, the effects of financial liberalization are likely to vary with financial and institutional developments. Removing financial controls may be efficiency-enhancing only in the absence of serious imperfections in the information and contracting environment. Following La Porta and others, we explore whether specific institutional variables that have been proven to promote financial development are also associated with the impact of liberalization on growth.[25] The usual suspects for explaining cross-country differences in financial sector development in this literature are the legal origin of law codes, rule of law, creditor protection, and effective protection of creditor rights.[26]

Presumably, economies that have weak legal protection for creditors are less likely to benefit from liberalization. The literature shows that this is a dominant feature explaining the development of financial markets. If protective measures are not in place, the liberalization of restrictions on intermediation is dampened by the adverse effects of institutional disarrays and does not promote financial sector development. The absence of legal protections that guarantee the ability of creditors to minimize their financial loss in case of borrower default can counteract the potential efficiency effects that financial liberalization can induce.

To test this hypothesis, we reestimate equation 1 including interactive terms between the liberalization measure, and the different proxies for legal protections. Specifically, we estimate

$$(2) \qquad \mathrm{GROWTH}_{ijt} = \alpha_0 + \alpha_1 \mathrm{SHARE}_{ijt-1} + \alpha_2 \mathrm{FINLIB}_{it} * \mathrm{REQ}_j + \alpha_3 \mathrm{FINLIB}_{it} * \mathrm{REQ}_j * \mathrm{LEG}_i + \mu_{ij} + \lambda_{it} + \varepsilon_{ijt},$$

where LEG is any of the legal protection proxies mentioned above. $\alpha_3$ captures the differential effect, if any, of countries with different degrees of legal protection.[27] Higher values of LEG indicate greater legal protection. Hence, one would expect $\alpha_3$ to be positive if our claims are accurate.

Table 2 reports our results regarding the differential impact of financial liberalization across countries. Column 1 reports the regression without any interaction with legal protection. The results are thus equivalent to

25. La Porta and others (1997, 1998).

26. Effective protection of creditor rights is the product of the rule of law index and creditor rights. It intends to capture the extent to which creditor rights regulations can be enforced. See Galindo and Micco (2002) for a discussion.

27. The sources and definitions of the measures used as proxies of legal protection are found in the data appendix.

**TABLE 2. Financial Liberalization and Growth: Interactions with Legal Protections**[a]

| *Explanatory variable* | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* |
|---|---|---|---|---|---|
| Industry's share in $t-1$[b] | −3.722 (0.538)*** | −3.735 (0.537)*** | −3.739 (0.536)*** | −3.722 (0.538)*** | −3.769 (0.526)*** |
| Dom. financial system liberation (DFSL)*External dependence | 0.036 (0.011)*** | 0.010 (0.016) | 0.005 (0.013) | 0.028 (0.041) | 0.021 (0.011)** |
| DFSL*External Dependence*Effective Creditor Rights | | 0.086 (0.039)** | | | |
| DFSL*External Dependence *Creditor Rights | | | 0.072 (0.031)** | | |
| DFSL*External Dependence*Rule of Law | | | | 0.012 (0.049) | |
| DFSL*External Dependence*English Legal Origin | | | | | 0.100 (0.041)** |
| Differential in growth[c] (institutional measure in average) | 1.3*** | | | | |
| Differential in growth (institutional measure in percentile 25) | | 0.7 | 0.9** | 1.2* | |
| Differential in growth (institutional measure in percentile 75) | | 1.9*** | 2.2*** | 1.4*** | |
| Differential in growth (no English legal origin) | | | | | 0.8** |
| Differential in growth (English legal origin) | | | | | 4.5*** |
| *Summary statistic* | | | | | |
| No. observations | 19,546 | 19,546 | 19,546 | 19,546 | 19,546 |
| No. countries | 28 | 28 | 28 | 28 | 28 |
| Country-year dummies | Yes | Yes | Yes | Yes | Yes |
| Country-industry dummies | Yes | Yes | Yes | Yes | Yes |
| *F* test[d] | | 8.15*** | 6.11*** | 8.62*** | 6.74*** |
| Prob > *F* | | 0.000 | 0.002 | 0.000 | 0.001 |

* Significant at 10 percent.

** Significant at 5 percent.

*** Significant at 1 percent.

a. The dependent variable is the annual real value added growth for each ISIC industry, in each country and in each year. DFSL is the domestic financial system liberalization, measured as the simple average of domestic banking system and stock market liberalization. All institutional variables (effective creditor rights, creditor rights, and rule of law) are normalized between 0 and 1, with 1 representing the best possible situation. English legal origin is a dummy that takes the value 1 when the country has an English legal origin and 0 otherwise. Standard errors consider clusters by country and industry and are reported in parentheses.

b. The industry's share of total value added in manufacturing in year $t-1$.

c. Differential in real growth rate measures (in percent) how much faster an industry at the seventy-fifth percentile level of external dependence grows with respect to an industry at the twenty-fifth percentile level when it is located in a country at the seventy-fifth percentile of financial development rather than in one at the twenty-fifth percentile. Significance level for each impact is calculated by the linear combination test: DFSL * REQ + DFSL * REQ * LEG (at the considered percentile) = 0, where REQ is the external dependence indicator and LEG the institutional variable considered.

d. *F* joint test: DFSL * REQ = DFSL * REQ * LEG = 0, where REQ is the external dependence indicator and LEG the institutional variable considered.

those above, except that they now focus on domestic financial liberalization. Column 2 reports the results of including the interaction of the liberalization measure and effective protection of creditor rights. Note that the significance of the liberalization measure itself drops, while the significance of the interaction term with the institutional variable is important. The loss of significance is attributed to the fact that both regressors are importantly collinear (0.76); hence, the relevant test is one on joint significance. We report this at the bottom of table 2. Joint significance is always above standard levels, independent of the legal protection proxy used. Columns 2 and 3 thus suggest that liberalization has a greater impact in countries that afford creditors greater protection. As above, we present the differential growth impact. When we compare this impact in countries in the seventy-fifth percentile of legal protection with those in the twenty-fifth, the results suggest that the differential impact is higher where creditor protection is in place. Column 4 shows the same exercise, using rule of law instead of effective creditor rights measures. Results are not strong, though their interpretation follows those of columns 2 and 3.

These measures of legal protection could be endogenous, in that the need for financial development may create pressure to improve legal protection. They could also be time-varying, but owing to data limitations, we assume they are fixed. To address these problems, we use the legal origin as a proxy for legal protection (column 5).[28] Our result is consistent with previous research: countries with a common law origin tend to have higher degrees of protection.[29] This result again suggests that greater legal protection magnifies the impact of financial liberalization on growth.

Liberalization only seems to boost growth if structural legal conditions, such as the protection of property and creditor rights, are embedded in the law codes and are effectively enforced. Without these requirements, liberalization does not seem to facilitate the firm's access to external funds. To check the robustness of these results, table 3 splits the sample between countries with high and low legal protection. Results hold, although they are not entirely conclusive.

28. Our proxy for legal protection is a dummy variable that is one for countries with common law legal origin and zero otherwise. It is necessary to mention that common law countries, on average, were not more liberalized than the rest of countries in all the sample years (for example, non-common-law countries are more liberalized in the '90s than common-law countries).

29. See La Porta and others (1998).

**TABLE 3. Financial Liberalization and Growth: Sampling by Legal Protections**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | *Effective creditor rights* | | *Creditor rights* | | *Rule of law* | | *English origin* | |
| *Explanatory variable*[a] | *Below median* | *Above median* | *Below median* | *Above median* | *Below median* | *Above median* | *No* | *Yes* |
| Industry's share in $t-1$[b] | −3.953 (0.416)*** | −3.551 (0.878)*** | −3.797 (0.501)*** | −3.70 (0.738)*** | −4.004 (0.775)*** | −2.978 (0.398)*** | −4.341 (0.346)*** | −3.078 (0.911)*** |
| Domestic financial system liberalization | 0.022 (0.015) | 0.053 (0.015)*** | 0.015 (0.012) | 0.051 (0.017)*** | 0.035 (0.016)** | 0.034 (0.009)*** | 0.023 (0.011)** | 0.110 (0.039)*** |
| Differential in growth[c] | 0.81 | 1.96*** | 0.56 | 1.89*** | 1.30** | 1.26*** | 0.85** | 4.07*** |
| *Summary statistic* | | | | | | | | |
| Observations | 9,135 | 10,411 | 7,578 | 11,968 | 8,657 | 10,889 | 14,452 | 5,094 |
| No. countries | 14 | 14 | 12 | 16 | 14 | 14 | 21 | 7 |
| Country-year dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-industry dummies | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

** Significant at 5 percent.

*** Significant at 1 percent.

a. The dependent variable is the annual real value added growth for each ISIC industry, in each country and in each year. Domestic financial system liberalization is measured as the simple average of domestic financial system and stock market liberalization and is interacted with industries' external financial requirements (external dependence). Each regressions is run using two samples, namely, the number of countries that fall below and above the median score for the category. Standard errors consider clusters by country and industry and are reported in parentheses.

b. The industry's share of total value added in manufacturing in year $t-1$.

c. Differential in real growth rate measures (in percent) how much faster an industry at the seventy-fifth percentile level of external dependence grows with respect to an industry at the twenty-fifth percentile level when it is located in a country at the seventy-fifth percentile of financial development rather than in one at the twenty-fifth percentile.

## Financial Liberalization, Financial Development, and Efficiency

The previous section shows that financial liberalization, in particular domestic financial liberalization, boosts growth in sectors requiring external capital. It does so either by increasing the size of the financial market (for example increasing the amount of credit to the private sector) or by improving the allocative efficiency of credit. We perform two exercises to analyze the channels through which liberalization affects growth. First, we study the relationship between the size of the financial sector (measured as credit to the private sector over GDP) and financial liberalization. Then we test whether financial liberalization has an effect on growth beyond its effect on the size of the financial system. If so, we interpret the result as an efficiency impact.

### *Financial Liberalization and the Size of the Financial System*

Table 4 reports the correlation between financial liberalization and the size of the financial system. We include interactive terms between the liberalization measure and the different proxies for legal protections of creditors. In addition to these variables, we include the lag of log per capita GDP and country fixed effects as controls. Our measure of the size of the financial system is the current ratio of credit to the private system over GDP.

Our results suggest that financial liberalization increases the size of the financial system in countries with relatively developed institutions. Specifically, countries with a low level of creditor protection do not take full advantage of the possible effects of liberalization. At the bottom of the table, we include estimates of the impact of financial liberalization on the size of the financial system in the extreme countries. For example, column 2 shows that in a country with low effective creditor rights (in the twenty-fifth percentile), liberalization has a minimum correlation with credit market development. An increase in liberalization leads to an increase in the size of credit markets on the order of 4.1 percentage points of GDP. In countries in which creditor rights are highly protected (in the seventy-fifth percentile), an increase in liberalization expands the size of credit markets by 23.2 percentage points of GDP. We obtain similar results for the case of creditor rights and rule of law.

Finally, column 5 reports the results of a similar exercise using a completely exogenous proxy for legal protections: the origin of the legal code.

**TABLE 4. Financial Liberalization and the Size of Financial Systems: Interactions with Legal Protections[a]**

| *Explanatory variable* | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* |
|---|---|---|---|---|---|
| Log of real GDPpc ($t-1$) | 0.094 (0.030)*** | 0.047 (0.021)** | 0.064 (0.025)*** | 0.077 (0.025)*** | 0.058 (0.024)** |
| Domestic financial system liberalization (DFSL) | 0.117 (0.036)*** | –0.021 (0.024) | –0.014 (0.029) | –0.008 (0.067) | 0.066 (0.025)*** |
| DFSL*Effective creditor rights | | 0.525 (0.110)*** | | | |
| DFSL*Creditor rights | | | 0.335 (0.095)*** | | |
| DFSL*Rule of law | | | | 0.192 (0.090)** | |
| DFSL*English legal origin | | | | | 0.331 (0.067)*** |
| Impact of financial lib. on development (in % GDP) | 11.7*** | | | | |
| Impact of financial lib. on development (in % GDP) (institutional variable in percentile 25) | | 4.1** | 7.0*** | 8.3** | |
| Impact of financial lib. on development (in % GDP) (institutional variable in percentile 75) | | 23.2*** | 23.7*** | 17.1*** | |
| Impact of financial lib. on development (in % GDP) (no English legal origin) | | | | | 6.6*** |
| Impact of financial lib. on development (in % GDP) (English legal origin) | | | | | 39.7*** |
| *Summary statistic* | | | | | |
| No. observations | 681 | 681 | 681 | 681 | 681 |
| No. countries | 27 | 27 | 27 | 27 | 27 |
| Country dummies | Yes | Yes | Yes | Yes | Yes |

** Significant at 5 percent.

*** Significant at 1 percent.

a. The dependent variable is the credit to private sector as percent of GDP. DFSL is domestic financial system liberalization, measured as the simple average between domestic system and stock market liberalization. The impact of financial liberalization on financial development is measured in percent of GDP, for countries at both the twenty-fifth and seventy-fifth percentile in each institutional variable considered. Significance level for each impact is calculated by the following linear combination test: DFSL + DFSL * LEG (at the considered percentile) = 0, where LEG is the institutional variable considered. All institutional variables (effective creditor rights, creditor rights, and rule of law) are normalized between 0 and 1, with 1 representing the best possible situation. English Legal Origin is a Dummy that takes the value 1 when the country has an English legal origin and 0 otherwise. Only twenty-seven countries are used because we do not have data on credit over GDP for Taiwan (see the data appendix). Standard errors consider clusters by country and industry and are reported in parentheses.

Not surprisingly, the results suggest that common law countries tend to benefit strongly from liberalizing because they are more oriented toward creditor protection.

### *Financial Liberalization and Domestic Financial System Efficiency*

The expansion of credit markets is not the only way that liberalization affects financial activity. As pointed out by Galindo, Schiantarelli, and Weiss, liberalization can also increase the allocative efficiency of credit and reduce agency costs in the securities market.[30] An indirect way to test this hypothesis is to return to our initial growth estimations and test whether liberalization has any impact on growth beyond increasing the size of credit markets. We therefore repeated the growth exercise of the previous section, this time including financial development and liberalization simultaneously. If liberalization has any effect beyond developing the size of credit markets, the liberalization variable itself must remain significant in our baseline regression.

Column 1 of table 5 shows that liberalization remains significant even when we control for financial development. This is a striking result considering that financial liberalization and financial development are correlated. It means that liberalization has an impact on growth beyond contributing to the development of the financial system. As in the previous exercise, we decompose the liberalization measure into domestic and external liberalization policies (columns 2–4). Domestic liberalization once again appears dominant.

## Conclusions

Financial market liberalization, particularly in the domestic banking system and stock markets, can be a growth-promoting policy under certain conditions. Using an econometric methodology that allows us to identify the effects of financial liberalization in a context of multiple reforms, we find that, on average, financial liberalization boosts the growth rates of industries that, for technological reasons, rely more on external financing than do other industries. The results presented in table 1 suggest that

30. Galindo, Schiantarelli, and Weiss (2001); Doidge, Karolyi, and Stulz (2001) explore the securities market issues.

**TABLE 5. Financial Liberalization and Domestic Financial System Efficiency[a]**

| *Explanatory variable* | *(1)* | *(2)* | *(3)* | *(4)* |
|---|---|---|---|---|
| Industry's share in $t-1$[b] | –3.920 | –3.921 | –3.921 | –3.910 |
| | (0.596)*** | (0.596)*** | (0.596)*** | (0.597)*** |
| Credit to private sector*External dependence | 0.096 | 0.094 | 0.094 | 0.111 |
| | (0.035)*** | (0.035)*** | (0.035)*** | (0.034)*** |
| Total financial liberalization*External dependence | 0.023 | | | |
| | (0.012)* | | | |
| Domestic financial liberalization *External dependence | | 0.024 | 0.024 | |
| | | (0.013)* | (0.011)** | |
| Capital account liberalization*External dependence | | 0.000 | | 0.011 |
| | | (0.012) | | (0.010) |
| *Summary statistic* | | | | |
| No. observations | 17,774 | 17,774 | 17,774 | 17,774 |
| No. countries | 28 | 28 | 28 | 28 |
| Country-year dummies | Yes | Yes | Yes | Yes |
| Country-industry dummies | Yes | Yes | Yes | Yes |

* Significant at 10 percent.
** Significant at 5 percent.
*** Significant at 1 percent.

a. The dependent variable is the annual value added growth for each ISIC industry, in each country and in each year. Financial development is measured as credit to the private sector as percent of GDP. Total financial liberalization is the simple average of domestic financial system, stock market, and capital account liberalization. Domestic financial liberalization is the average of domestic financial system and stock market liberalization. All variables are interacted with industries' external financial requirements. Standard errors consider clusters by country and industry and are reported in parentheses.

b. The industry's share of total value added in manufacturing in year $t-1$.

sectors with higher external dependence grow 1.33 percent faster after liberalization than industries with low external financing requirements. This is a proof that liberalization lowers the cost of external funds for firms.

The effects of liberalization differ significantly across countries, however, and they are strongly related to the quality of the institutions governing credit markets. Table 2 shows that countries characterized by a low level of legal protection (creditor rights and rule of law) benefit less from financial liberalization than countries with strong institutions. This result is consistent with previous literature showing the importance of adequate institutions for the development of financial markets.

We identify two transmission channels from financial liberalization to growth. First, we find that financial liberalization is associated with deeper credit markets. Once again this result is conditional on the quality of underlying institutions. Previous research based on similar methods indicates that the development of the financial sector—understood as an increase in the size of credit markets—tends to reduce the cost of funds

and to foster the growth of sectors dependent on external capital. Second, we find evidence that financial liberalization also leads to efficiency gains in financial intermediation. That is, it not only increases the size of credit markets, but also improves the efficiency with which funds are allocated.

Throughout the paper, we have estimated the long-run effects of financial liberalization. This paper does not explore the short-run dynamics, and thus it does not provide an adequate setup for analyzing the impacts of short-run events such as financial crises. Recent research shows that financial liberalization can lead to financial crises under certain conditions—and growth collapses during and immediately after a financial crisis. Since we are not modeling the short-run dynamics, our methodology only captures these effects very indirectly. Demirgüç-Kunt and Detragiache's research on financial crises shows that liberalization increases the likelihood of a crisis when basic institutions governing credit markets are weak (that is, when rule of law is weak, creditors are unprotected, and regulation is deficient).[31] We find that under these same conditions, liberalization also has a lower effect on growth. Our findings can be related to the financial crisis hypothesis, but we believe that they are also capturing long-run effects on financial market development.

## Data Appendix

### *Value Added*

Data on value added for each industry in each country were obtained from the *Industrial Statistics Yearbook* database compiled by the United Nations Statistical Division.[32] We use the United States consumer price index (CPI), obtained from the International Monetary Fund's *International Finance Statistics* (IFS) database, to deflate our series.[33] In some cases we interpolate data on value added for four-digit industries, so as not to lose important information. The results hold when we do not interpolate four-digit industry data.

31. See Demirgüç-Kunt and Detragiache (1998).
32. UNIDO (2001).
33. IMF (2002).

### *External Capital Dependence*

Our measure of sectoral dependence on external financing is taken from Rajan and Zingales.[34] They define it as the fraction of capital expenditures not financed with cash flow from operations, where the latter is the sum of Compustat funds from operations, decreases in inventories, decreases in receivables, and increases in payables, while the former is the ratio of capital expenditures to net property, plant, and equipment. Their dataset covers thirty-seven industries, of which twenty-eight correspond to three-digit ISIC codes and nine correspond to four-digit ISIC code.

### *Financial Development*

Our measure of financial development is credit to the private sector in percent of GDP, obtained from *World Development Indicators.*[35] We do not consider Taiwan in the analysis of financial development because the World Bank database does not provide data on this country.

### *Financial Liberalization*

Our sample comprises the twenty-eight countries for which Kaminsky and Schmukler have data on financial liberalization for the period 1973–98.[36] These data include information on capital accounts, domestic financial sectors, and stock market liberalization. For capital market liberalization, they study whether corporations are allowed to borrow abroad and whether multiple exchange rate mechanisms or other sorts of capital controls are in place. Regarding domestic financial liberalization, they explore interest rate controls (lending and deposits) and other restrictions, such as directed credit policies or limitations on foreign currency deposits. Their analysis of stock market liberalization encompasses the degree to which foreigners are allowed to own domestic equity and restrictions on repatriation of capital, dividends, and interest. Each variable at each point in time is measured according to an index ranging from 1 to 3, depending on the intensity of liberalization: 1 if there is no liberalization (restrictions are widespread or there are outright prohibitions), 2 if there is partial liberalization, and 3 if there is full liberalization. The countries and regions with information are listed in table 6.

34. Rajan and Zingales (1998).
35. World Bank (2001).
36. Kaminsky and Schmukler (2001).

**TABLE 6. Legal Protections Indicators**

| *Region and country* | *Creditor rights* | *Rule of law* | *Effective creditor rights*[a] | *Legal origin* |
|---|---|---|---|---|
| *Asia* | | | | |
| Hong Kong | 1.00 | 0.82 | 0.82 | English |
| Indonesia | 1.00 | 0.40 | 0.40 | French |
| Korea | 0.75 | 0.54 | 0.40 | German |
| Malaysia | 1.00 | 0.68 | 0.68 | English |
| Philippines | 0.00 | 0.27 | 0.00 | French |
| Taiwan | 0.50 | 0.85 | 0.43 | German |
| Thailand | 0.75 | 0.63 | 0.47 | English |
| Average Asia | 0.71 | 0.60 | 0.46 | |
| *Latin America* | | | | |
| Argentina | 0.00 | 0.54 | 0.00 | French |
| Brazil | 0.25 | 0.63 | 0.16 | French |
| Chile | 0.50 | 0.70 | 0.35 | French |
| Colombia | 0.00 | 0.21 | 0.00 | French |
| Mexico | 0.00 | 0.54 | 0.00 | French |
| Peru | 0.25 | 0.25 | 0.06 | French |
| Venezuela | 0.50 | 0.64 | 0.32 | French |
| Average Latin America | 0.21 | 0.50 | 0.13 | |
| *Europe* | | | | |
| Denmark | 0.75 | 1.00 | 0.75 | Scandinavian |
| Finland | 0.25 | 1.00 | 0.25 | Scandinavian |
| Ireland | 0.25 | 0.78 | 0.20 | English |
| Norway | 0.50 | 1.00 | 0.50 | Scandinavian |
| Portugal | 0.25 | 0.87 | 0.22 | French |
| Spain | 0.50 | 0.78 | 0.39 | French |
| Sweden | 0.50 | 1.00 | 0.50 | Scandinavian |
| Average Europe | 0.43 | 0.92 | 0.40 | |
| *G-7* | | | | |
| Canada | 0.25 | 1.00 | 0.25 | English |
| France | 0.00 | 0.90 | 0.00 | French |
| Germany | 0.75 | 0.92 | 0.69 | German |
| Italy | 0.50 | 0.83 | 0.42 | French |
| Japan | 0.50 | 0.90 | 0.45 | German |
| United Kingdom | 1.00 | 0.86 | 0.86 | English |
| United States | 0.25 | 1.00 | 0.25 | English |
| Average G-7 | 0.46 | 0.92 | 0.42 | |

Source: First and fourth columns: La Porta and others (1998); remaining columns: Kaufmann and others (2002).

a. Effective creditor rights in third column is the product of creditor rights in first column and rule of law in second column.

### *Institutional Variables*

Measures of institutional development such as creditor rights, rule of law, and legal origin were obtained from La Porta and others and from Kauffman, Kraay, and Zoido-Lobatón.[37] These measures range between 0 (complete lack of those properties) and 1 (total presence). We present these indicators in table 6.

37. La Porta and others (1998); Kauffman, Kraay, and Zoido-Lobatón (2002).