

## Comments

**Arturo Bris:** The impact of financial liberalization on growth is an empirically challenging question. The economic theory predicts an unequivocally positive effect of liberalization on growth. Identifying such an effect, however, is not so simple. First, financial liberalization policies are commonly coupled with other changes in the functioning and regulation of the financial system. A good example of this is Italy, where a general overhaul of the securities markets in 1991 brought in new legislation on takeovers, insider trading, market liberalization, derivatives trading, and trading systems, among others. Isolating the effects of liberalization is a hard task in such an environment. Second, as the authors clearly state in the article, it is difficult to argue that the causality between liberalization and growth is unidirectional. Any cross-sectional regression would suffer an endogeneity problem.

Galindo, Micco, and Ordoñez circumvent these difficulties by using the methodology pioneered by Rajan and Zingales.<sup>1</sup> The explicit assumption here is that financial liberalization fosters more growth in industries that are more financially dependent. By regressing a measure of industry growth on the product of a financial liberalization index and a measure of industry's financial development, the authors conclude that more liberalized countries grow faster. Moreover, because they use a panel of industry-country-year observations, they can control for fixed effects—like the effects of other regulatory changes.

My comments are organized as follows: I begin with some methodological issues and then comment on the interpretation of the results.

### *Methodological Issues*

An observation in this article is an industry-country-year. This is how the authors are able to control for other institutional changes at the country level. In equation 2, for instance, there are twenty-eight countries times

1. Rajan and Zingales (1998).

twenty years (approximately), which equals 560 country-year dummies that perfectly capture the effect of specific policy measures different from financial liberalization. To avoid multicollinearity, the regression must not include any other country-year specific variable (such as, say, the inflation rate), and the financial liberalization index must therefore be interacted with a measure of industry-specific financial dependence. This is an extremely intelligent approach. The only industry-specific variables used in the estimation, however, are the index of the industry's financial dependence and industry fixed effects. The index of financial dependence is taken from Rajan and Zingales; it is therefore estimated with U.S. data.<sup>2</sup> The industry fixed effects, in turn, are, by definition, equal across countries. Consequently, the regressions in the paper do not have any country-industry specific control. What if the semiconductor industry grows consistently more in Taiwan than it does in France? Or, since the paper and pulp industry is an export sector in Finland, should one expect the effect of financial liberalization on the industry's growth to be stronger in Finland than in the United States?

A second issue has to do with the interaction with the corporate governance variables. The authors argue that because the correlation between the corporate governance variables and the financial liberalization index is high, it is sensible that both variables become jointly insignificant at explaining growth. This is why, they say, individual *t* statistics are not reliable, and they instead use a test of joint significance. The test of joint significance rejects the hypothesis that both coefficients are zero. However, it is not convincing evidence that the corporate governance measures are significant alone. Table 3 then splits the sample depending on whether the industry (country) has an index of investor protection higher or lower than the sample median. As the authors recognize, the evidence is not conclusive.

Finally, a comment on the analysis of financial liberalization and the efficiency of the domestic financial system. The regression in table 5 uses credit to the private sector—a measure of financial development—and the financial liberalization index, as independent variables. The issue of multicollinearity is important here, but it is not acknowledged. My suggestion is to instrument either one, or else to orthogonalize the financial develop-

2. Rajan and Zingales (1998).

ment index with respect to the financial liberalization index in a first step, and then regress the annual value added growth on the liberalization index, and the orthogonal component of financial development.

### *Interpretation of the Results*

The main result of the paper is that industries in more liberalized countries grow faster. There are several channels through which liberalization affects growth, and the authors explore some of them. It is possible that the effect of liberalization varies with the country's institutional development. This question is analyzed in tables 2 and 3. The authors find weak evidence that corporate governance measures, when interacted with the domestic financial liberalization index, have a significant impact on growth. Because the measures of investor protection they use can be endogenous, they also use the legal origin of the country as a proxy for investor protection. The coefficient for the legal origin is significantly positive. In conclusion, liberalization has a stronger effect on growth in countries with English legal origin.

That interpretation is not convincing. On average English-legal origin countries are more liberalized. Thus it is possible that interacting an English-legal-origin dummy with the liberalization index only reinforces the effect of the latter variable. Moreover, the legal origin, as the rest of the corporate governance variables, is not time varying. Finally, the panel regression is estimated without year fixed effects. It seems to me that there is no gain here from estimating a panel regression other than an increase in the degrees of freedom. But then the interpretation of the results is highly problematic.

**Andrea Repetto:** Arturo Galindo, Alejandro Micco, and Guillermo Ordoñez provide us with interesting evidence on a number of important questions regarding financial markets and growth. First, they show that the effects of financial liberalization on growth are positive and large. Second, they establish that liberalizing domestic capital markets facilitates growth, but that liberalizing the capital account does not. Third, they show evidence of a larger effect of liberalization on growth in countries where creditor rights are better protected. Finally, they show that the effect of liberalization on growth goes beyond its effect on the size of the financial market.

In the paper, the authors take advantage of the identification framework originally proposed by Rajan and Zingales.<sup>1</sup> This framework allows them to circumvent a number of methodological problems that plague regressions using aggregate data—such as causality issues and reform endogeneity—and thus to provide clear-cut evidence on the relationship between financial liberalization and growth.

I have two sets of comments: first a number of methodological issues, all of them easy to incorporate, and then suggestions for future research.

My first methodological comment refers to the identification approach. Specifically, the authors rely on a differences-in-differences-in-differences (DDD) estimation method. That is, they first compare the growth of one industry in a country that liberalized to the growth of the same industry in a country that did not liberalize. This step corresponds to the first two Ds. Then they compare, within the same country, an industry with low external financial needs to one with high external financial needs. This comparison corresponds to the third D. The method is quite appealing because it is easy and simple to use, but it has some drawbacks. First, it assumes that in the absence of liberalization, industries located in different countries would have experienced the same growth rate paths, an assumption that might prove wrong. Second, it assumes that the error terms are uncorrelated over time—a problem inherent in most of the literature based on this approach. If this assumption is incorrect, then OLS estimates are consistent, but the standard estimate of the coefficients' variance-covariance matrix is not. In this context, Bertrand, Duflo, and Mullainathan show that differences-in-differences methods tend to overreject the null hypothesis of no effect of the treatment when there is an autocorrelation bias in standard errors.<sup>2</sup> Fortunately, they also provide us with fixes for this problem.

A related methodological comment is that OLS yields inconsistent estimates when the error term is autocorrelated and the lagged endogenous variable is an explanatory variable. Papers by Arellano and Bond and by Arellano and Bover solve this and similar econometric problems by developing a number of estimators based on the generalized method of moments.<sup>3</sup>

1. Rajan and Zingales (1998).

2. Bertrand, Duflo, and Mullainathan (2002).

3. Arellano and Bond (1991); Arellano and Bover (1995).

Finally, the authors use both the level of the liberalization variables and their principal components. I have trouble with these latter measures, since principal components are difficult to interpret, as a marginal change represents the marginal change in a linear combination of a number of variables. Also, principal components do not consider all the information in the data. Moreover, they depend on the units of measurement. The findings of the paper are robust to different measures of financial liberalization, so I think the authors can safely omit the results based on principal components.

The results in the paper have a number of interesting implications. I now turn to my suggestions for further research. A simple, yet crucial question that can be addressed without any further work is how long the effects of financial liberalization on growth last. The estimates the authors provide correspond to the short-run effects. The finding that the coefficient on the lagged industry share is significant indicates that there are also long-run effects on growth, which might be different from the short-term effects.

The authors' results suggest that financial liberalization reduces the cost of external finance to financially dependent industries. Kaminsky and Schmukler's liberalization index focuses on changes that make it easier to bring together savers and borrowers. For instance, the index considers changes on the regulation of deposit interest and lending rates, as well as regulatory changes on the acquisition of shares in the domestic stock market by foreigners. However, the index does not consider policies that change the cost at which investors—both creditors and shareholders—see their claims honored. In the period of analysis, several countries passed laws that changed the legal protection of investors. To look at the role of this channel in facilitating growth, it might be worth developing measures similar to those in La Porta and others, but that vary over time.<sup>4</sup>

An intriguing result is that capital account liberalization does not matter for growth. Why is there an asymmetry between domestic and external financial markets? Is it because capital account liberalization increases market volatility? Is it perhaps, because foreign money pulls out at the first sign of trouble? Or is it because it is more difficult to legally enforce international than local lending contracts? If so, is it then the case that export-

4. La Porta and others (1998).

oriented industries are more sensitive to liberalization, since they can pledge their external proceeds as collateral?

Another question that follows from the paper's results is how growing industries adjust to financial liberalization. Do fast-growing industries reshuffle resources across existing firms? Does the entry rate of firms increase? Do incumbents grow faster? Rajan and Zingales argue that financial development disproportionately favors new entrants over incumbents.<sup>5</sup> According to the authors, established firms tend to finance new projects on retained earnings and have more collateral, a reputation, and perhaps relationships with lenders that allow them to have better access to project financing. If so, then we should observe that liberalization has a positive impact on the growth rate of entrants rather than on the growth rate of incumbents, particularly in industries that depend heavily on external financing.

Finally, if countries with poor corporate governance develop substitute mechanisms that protect external finance—such as collateral and high ownership concentration—then are these industries more sensitive to financial liberalization? A recent paper by Braun finds strong evidence of the effects of collateral on growth, using the same methodological framework of this paper.<sup>6</sup>

Overall, Arturo, Alejandro and Guillermo have provided us with new information that will certainly turn out useful for policymakers and researchers trying to better understand the way financial markets work.

5. Rajan and Zingales (2001).

6. Braun (2002).

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