Commentary

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Bekaert, Harvey, and Lundblad (BHL) are to be congratulated for producing another paper on equity market liberalizations in emerging markets, and it is a pleasure to discuss their work. Yet, there are three reasons why I may not be an impartial discussant: (i) Having devoted most of my fledgling career to the study of capital account liberalization in emerging markets, I am favorably disposed to the research topic; (ii) my published work contains extensive citations to the authors' papers; and (iii) I am in broad agreement with the lion's share of the authors' conclusions about the effects of equity market liberalization on the cost of capital.

The BHL paper has three central themes. First, liberalization reduces the cost of capital. Second, dating liberalizations is difficult and we should try to do a better job of pinning down precise liberalization dates. Third, and most importantly, the liberalization-induced fall in the cost of capital increases the growth rate of gross domestic product (GDP) per capita by 1 percentage point per annum.

I believe the first message. There is broad consensus that liberalization reduces the cost of capital by up to 100 basis points, depending on how you date the liberalization (Bekaert and Harvey, 2000; Henry, 2000a; Martell and Stulz, 2003; Stulz, 1999). All of the evidence we have supports this qualitative conclusion and suggests that the effects are economically significant, even if we can't precisely pin down the magnitude of the effects (Henry 2000b, 2003).

I also believe the second message. Liberalizations are difficult to date. While there is broad agreement that liberalization reduces the cost of capital, there is some disagreement about the exact timing of liberalizations. This matters, in principle, because the size of the effect depends on what liberalization

date one chooses. On the other hand, changing liberalization dates has virtually no effect on the qualitative conclusion that liberalization reduces the cost of capital. Because more precise dates are likely to strengthen our previous conclusions about the financial effects of liberalization, and because this is a conference on the real effects of finance, most of my comments will be directed toward the third message, which is summarized in Table 4 of BHL's paper—equity market liberalization increases the growth rate of GDP per capita by 1 percent per annum.

I don't believe the third message. The claim that stock liberalizations increase the growth rate of GDP per capita by 1 percent per annum is inconsistent with the assumptions of the neoclassical growth model on which the analysis is based. The rest of my comments will be devoted to developing this thought in detail, but, first, a small digression.

The paper uses the terms "equity market liberalization" and "financial liberalization" interchangeably. Doing so is potentially confusing. Financial liberalization refers to the removal of domestic financial repression—government-imposed interest rate ceilings, restricted use of savings for consumer credit purposes, and the like (McKinnon, 1973; Shaw, 1973). The McKinnon-Shaw literature studies the effects of financial liberalization on interest rates and growth, but financial liberalization, per se, has nothing to do with granting foreigners access to domestic capital markets.

In contrast, the BHL paper summarizes the empirical effects of equity market liberalization, a decision by a country's government to allow foreigners to purchase shares in the domestic equity market. Strictly speaking, equity market liberalization is a specific type of capital account liberalization, which is a decision to allow capital in all forms to move freely in and out of the domestic market. In other words, the distinction between financial liberalization and capital account liberalization is worth making because the two terms mean very different things in the literature and none of the BHL results have anything to do with financial liberalization in the traditional sense. For the sake of clarity, I would hold to the traditional nomenclature.

FINANCIAL EFFECTS OF LIBERALIZATION: COST OF CAPITAL

Back to the main issues. An emerging economy's cost of capital should fall when it liberalizes its equity market. The following partial-equilibrium, mean variance arguments based on Stulz (1999) make the central points most succinctly.

Assume a small country whose equity market is completely segmented from world equity markets. Also assume that all investors in the world have the same constant relative risk aversion and care about only the expected return and variance of their investment. Let $E[\bar{R}_M]$ denote the equilibrium required rate of return on the aggregate domestic stock market before liberalization, and let r_f denote the domestic risk-free interest rate. Define the price of risk as follows: the aggregate risk premium, $E[\bar{R}_M]-r_f$, divided by the variance of the aggregate return on the market, $VAR(\bar{R}_M)$. Under our assumptions, the price of risk in the small country before liberalization is a constant, T. It follows that

$$(1) \qquad E[\bar{R}_M] = r_f + \mathrm{T}Var(\bar{R}_M).$$

Now consider what happens to the required rate of return when the country opens its stock market to the rest of the world and also allows its residents to invest abroad. Assume that the mean and variance of domestic dividends are unaltered by the liberalization. Let $E[\bar{R}_M^*]$ denote the required rate of return on the market after liberalization and let $E[\bar{R}_W]$ be the required rate of return on the world equity market. With completely open capital markets, the world risk-free rate, r_f^*, becomes the relevant interest rate. The risk premium on the domestic stock market will now depend on the following two factors: (i) the beta of the domestic stock market with the world stock market, β_{MW}, and (ii) the world risk premium, $E[\bar{R}_W]-r_f^*$. Following liberalization it must be the case that

$$(2) \qquad E[\bar{R}_M^*] = r_f^* + \beta_{MW}(E[\bar{R}_W]-r_f^*).$$

Since the liberalizing country is small, adding its stock market to the world market portfolio has a negligible effect on the variance (and hence the risk premium) of the world market portfolio. It follows that $(E[\bar{R}_W]-r_f^*) = \mathrm{T}VAR(\bar{R}_W)$. Using this fact, the definition of β_{MW}, and a little bit of algebra, one can show that after liberalization the required rate of return on the domestic stock market is given by

$$(3) \qquad E[\bar{R}_M^*] = r_f^* + \mathrm{T}Cov(\bar{R}_M,\bar{R}_W).$$

Subtracting equation (1) from equation (3) gives the difference in the post- and pre-liberalization required rates of return:

$$(4) \quad \Delta E[\bar{R}_M] = (r_f^* - r_f) + \mathrm{T}[Cov(\bar{R}_M,\bar{R}_W) - Var(\bar{R}_M)].$$

Since poor countries have lower capital-to-labor ratios than rich countries, we would expect that $r_f > r_f^*$. Hence the first term on the right-hand side of (4) is negative. Next, consider the change in the equity premium. For every country in the sample, the covariance of the local market with the world market, $Cov(\bar{R}_M,\bar{R}_W)$, is less than the variance of the local market, $Var(\bar{R}_M)$ (Stulz, 1999). Hence the second term is also negative. The central result follows: Liberalization reduces the cost of capital.

REAL EFFECTS OF LIBERALIZATION: INVESTMENT AND GROWTH

Since liberalization reduces the cost of capital, firms should engage in arbitrage between equities and physical assets, as described by Fischer and Merton (1984) and Tobin and Brainard (1977). The Solow growth model illustrates the point (Solow, 1956). Before liberalization, the economy is in steady state: The marginal product of capital equals the cost of capital; the capital stock and the labor force are growing at the same rate. Liberalization occurs and the cost of capital falls. Firms respond by driving down the marginal product of capital to its new lower cost. But marginal products and costs can be equalized only if the capital stock temporarily grows faster than the labor force. Hence, there must be an increase in the growth rate of the capital stock (investment). Once the marginal product of capital falls to the post-liberalization cost of capital, the growth rate of the capital stock will return to its pre-liberalization rate (i.e., the same rate as the labor force).

Since the growth rate of the capital stock increases, the growth rate of output per worker should also rise in accordance with the standard growth accounting equation:

$$(5) \qquad \hat{Y} = \hat{A} + \alpha\hat{K} + (1-\alpha)\hat{L},$$

where a circumflex over a variable denotes the change in the natural log of that variable.

Figure 1

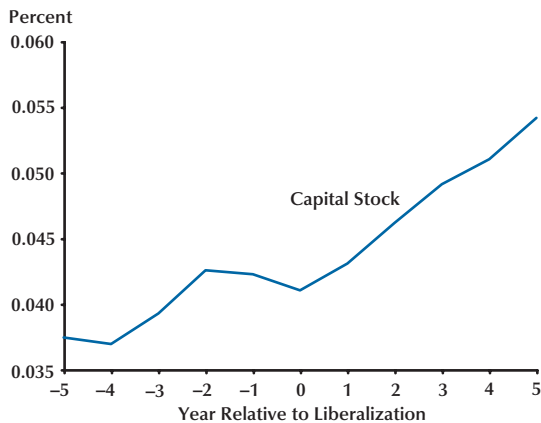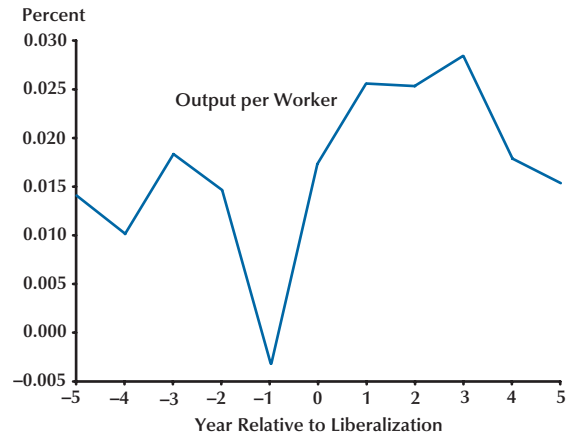**Investment Increases Following Equity Market Liberalizations**

Percent

Year Relative to Liberalization

Figure 2

The Increase in Growth Following Equity Market Liberalizations Is Too Large To Be Explained by the Increase in Investment

Percent

Year Relative to Liberalization

EVIDENCE AND CONCERNS ABOUT THE BHL FINDINGS ON LIBERALIZATION AND GROWTH

With all of the theoretical pieces in place for understanding the effects of liberalization, I now turn to the raw data that form the basis of the central BHL results. The sample of countries that I use in my analysis consists of the countries and liberalization dates reported in Table 1 of the BHL paper. Figures 1 through 4 produce the basic evidence.

Consistent with firms increasing investment in response to a liberalization-induced fall in the cost of capital, Figure 1 shows that the growth rate of the capital stock rises in the aftermath of liberalizations. To give a rough sense of magnitudes, I use the data presented in Figure 1 to calculate the average growth rate in the five-year period preceding the liberalization (years –5 through –1) and the average growth rate in the five-year period following the liberalization (years 1 through 5).[1] This calculation reveals that the growth rate of the capital stock increases by 0.9 percentage points—from an average of 4.0 percent per year in the pre-liberalization period to an average of 4.9 percent in the post-liberalization period.

Figure 2 confirms that the growth rate of output per worker rises by 1.0 percentage points—from an average of 1.2 percent per year in the pre-liberalization period to an average of 2.2 percent

per year in the post-liberalization period. On the one hand, there is nothing surprising about Figure 2. Whereas Figure 1 documents a behavioral response of the quantity of capital to liberalization, Figure 2 simply provides a mechanical check of the standard growth accounting equation (5).

On the other hand, Figure 2 is interesting in that the increase in the growth rate of output per worker is too large to be explained by the increase in the growth rate of the capital stock. A few simple calculations illustrate the point. The elasticity of output with respect to capital, α, is typically around 0.33. So, based on Figure 1, we would expect the growth rate of output per worker in the post-liberalization period to be about 0.297 (0.33 times 0.9) percentage points higher. But Figure 2 displays a 1.0-percentage-point increase in the growth rate of output per worker.

All else equal, a 0.9-percentage-point increase in the growth rate of the capital stock can produce a 1.0-percentage-point increase in the growth rate of output per worker only if the elasticity of output with respect to capital is slightly larger than 1! In their NBER working paper on liberalization and growth, the authors find that the increase in growth due to liberalization is slightly larger than 1 percentage point, even after controlling for a number of variables (Bekaert, Harvey, and Lundblad, 2001).

There are two possible explanations of such a result. Either (i) capital accumulation in emerging markets is characterized by increasing returns or

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[1] All before-and-after growth rates quoted for Figures 2 through 4 are based on analogous calculations.

(ii) the BHL estimates of the effect of liberalization on growth are overstated. I think the BHL estimates of the effect of liberalization on growth are overstated because they fail to properly account for the effect of increases in total factor productivity (TFP) growth that closely coincide with stock market liberalizations, but are not a result of the stock market liberalizations per se. Let me explain.

Equation (5) shows that any increase in the rate of growth of output that is not accounted for by an increase in the growth rate of capital and labor must be the result of an increase in $\hat{A}$, the growth rate of TFP. So, one way to rationalize the BHL results is to claim that, in addition to increasing investment, stock market liberalizations also drive up TFP growth. However, it is important to remember that the theory of capital account liberalization focuses exclusively on capital accumulation. Technological change and TFP growth do not enter into the story. Therefore, one cannot automatically claim that liberalization is also responsible for the increase in TFP growth.

Now, it is true that if liberalization increases the allocative efficiency of domestic investment, it will also raise TFP growth without any need for technological change. However, it is not obvious why capital account liberalization, a policy change directed at increasing international allocative efficiency, would have any effect on domestic allocative efficiency (Henry, 2003). But if equity market liberalization is not responsible for the increase in TFP growth, what is?

The simple answer is that other economic reforms are at work. Indeed, stock market liberalizations are part of a general process that involves substantial macroeconomic reforms such as inflation stabilization and trade liberalization. While we typically interpret $\hat{A}$ as the growth rate of technological progress, any economic reform that raises the efficiency of a given stock of capital and labor will also increase $\hat{A}$, even in the absence of technological change. In other words, holding the productivity of capital constant, liberalization reduces the cost of capital and encourages more rapid investment; holding capital account policy constant, economic reforms raise the marginal product of capital. Because liberalizations do not occur in isolation, it is important to think carefully about how to interpret the data.

Now the authors certainly acknowledge the importance of other economic reforms. The paper contains a lot of tables and lists of reforms and discusses the importance of thinking about those

reforms. But those events are not employed in their analysis of liberalization on growth (BHL, 2001).

The authors perform panel regressions of country growth rates on a liberalization dummy (Table 4 of the paper summarizes the results), but they do not include dummy variables for the other reforms, which they so painstakingly list in Table 3. For example, in place of a discrete dummy variable for trade reform that would tell us whether growth increases following trade reforms, they use a continuous proxy variable—trade as a fraction of GDP. They follow a similar approach with respect to inflation stabilization. I do not understand this asymmetric treatment of the economic reforms. If you are performing a before-and-after experiment of equity market liberalizations on growth, it seems natural to perform a before-and-after experiment for the other reforms on growth as well.
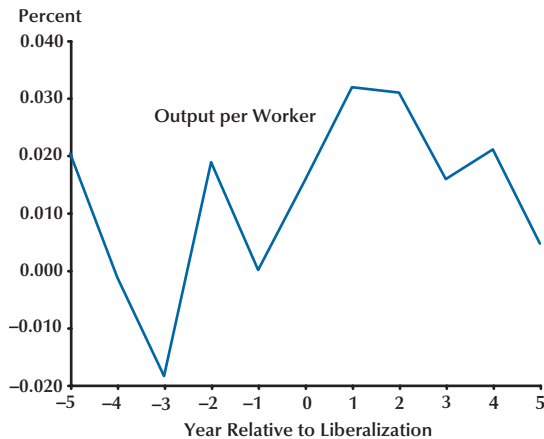
Since the other economic reforms never enter the empirical specifications in the same manner as the equity market liberalizations, it is not clear how much confidence we can place in the authors' claim that their estimated effect of equity market liberalization on growth—1 percentage point per annum—is robust to other reforms. I have already argued that this claim is inconsistent with standard production theory. I have also argued that this inconsistency cannot be easily reconciled by claiming that liberalization increases TFP growth. Therefore, the sensible conclusion is, contrary to the authors' claim, that their estimate is not robust to the inclusion of other reforms. Let me now illustrate the point empirically with a few simple pictures.

Standard trade theory predicts that trade liberalization will increase TFP. As countries tilt production toward their comparative advantage, they will experience an increase in output, for a given stock of capital and labor. Figure 3 plots the average growth rate of output per worker across all of the countries in the BHL sample following trade liberalizations. The trade liberalization dates are taken from Sachs and Warner (1995). The figure shows that the average growth rate of output per worker rises by 1.5 percentage points following trade liberalizations—from an average of 0.6 percent per year in the five years preceding trade liberalization to an average of 2.1 percent per year in the five years after.

Stabilizing inflation may also increase TFP, because high inflation generates incentives for workers and producers to divert resources away

Figure 3

Growth Also Increases Following Trade Liberalizations

Percent

Output per Worker

Year Relative to Liberalization

Figure 4

Growth Also Increases Following Inflation Stabilization Programs

Percent

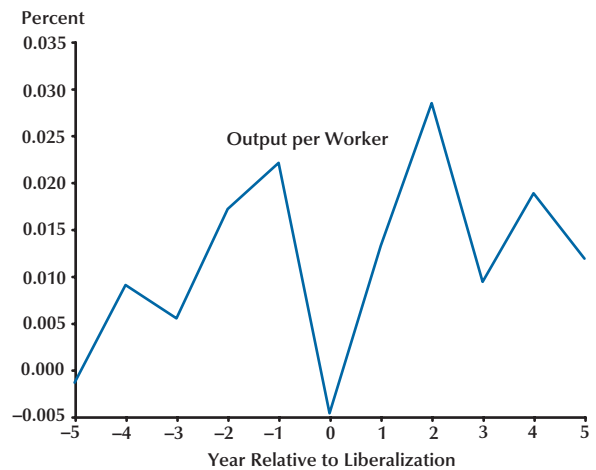Output per Worker

Year Relative to Liberalization

from productive activities that increase output and toward activities that help them avoid the costs of high inflation. There is an extensive literature that demonstrates that stabilizing high inflation is good for asset prices, investment, and output (Henry 2000b, 2002; Fischer, Sahay, and Végh, 2002; Calvo and Végh, 1999; Easterly, 1996).

Figure 4 plots the average growth rate of output per worker across all of the countries in the BHL sample following inflation stabilization programs. The inflation stabilization dates are taken from Henry (2002). In countries where there are multiple stabilization dates, the last stabilization date was chosen. Figure 4 shows that the growth rate of output per worker rises by 0.8 percentage points following stabilization programs—from an average of 0.8 percent per year in the five years preceding stabilization to an average of 1.6 percent per year in the five-year post-liberalization period.

Pictures are of course not conclusive. One would also want to conduct some serious econometric exercise that attempts to disentangle the effects of these and other reforms on growth. My only point is that there are strong a priori theoretical reasons to expect reforms other than equity market liberalization to have a significant effect on economic growth. The raw data do no harm to this view and provide strong prima facie evidence that the BHL analysis significantly overstates the effect of equity market liberalization on growth.

CONCLUDING THOUGHTS

The problems with the BHL findings on equity market liberalization and growth are not unique. Interpretation problems are endemic to cross-country growth regressions. Whatever growth in output is not explained by growth in inputs is, by definition, a result of TFP growth. Without a clean theoretical link between TFP growth and equity market liberalization, however, it is not clear how to interpret the results. Nevertheless, the authors deserve credit for tackling an important question. We certainly need a better understanding of the ways in which the effects of liberalization are transmitted to the real economy, but the results on equity market liberalization and growth are difficult to believe. I look forward to reading their future efforts at sorting out these difficult but important issues.

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