CDDRL
WORKING PAPERS

Number 75
January 2007

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Center on Democracy, Development, and The Rule of Law
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This working paper was produced as part of CDDRL's ongoing programming on economic and political development in transitional states. Additional working papers appear on CDDRL's website: http://cddrl.stanford.edu.

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CDDRL was founded by a generous grant from the Bill and Flora Hewlett Foundation in October in 2002 as part of the Stanford Institute for International Studies at Stanford University. The Center supports analytic studies, policy relevant research, training and outreach activities to assist developing countries in the design and implementation of policies to foster growth, democracy, and the rule of law.

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Capital Account Liberalization, the Cost of Capital, and Economic Growth

Peter Blair Henry*

Capital account liberalization was once seen as an inevitable step along the path to economic development for poor countries. Liberalizing the capital account, it was said, would permit financial resources to flow from capital-abundant countries, where expected returns were low, to capital-scarce countries, where expected returns were high. The flow of resources into the liberalizing countries would reduce their cost of capital, increase investment, and raise output (Fischer, 1998; Summers, 2000). The principal policy question was not whether to liberalize the capital account, but when— before or after undertaking macroeconomic reforms such as inflation stabilization and trade liberalization (McKinnon, 1991). Or so the story went.

In recent years intellectual opinion has moved against liberalization. Financial crises in Asia, Russia and Latin America have shifted the focus of the conversation from when countries should liberalize to if they should do so at all. Opponents of the process argue that capital account liberalization does not generate greater efficiency. Instead, liberalization invites speculative hot money flows and increases the likelihood of financial crises with no discernible positive effects on investment, output, or any other real variable with nontrivial welfare implications (Bhagwhati, 1998; Rodrik, 1998; Stiglitz 2002).

While opinions about capital account liberalization are abundant, facts are relatively scarce. This paper tries to increase the ratio of facts to opinions. In the late 1980s and early 1990s a number of developing countries liberalized their stock markets, opening them to foreign investors for the first time. These liberalizations constitute discrete changes in the degree of capital account openness, which allow for a positive empirical description of the cost of capital, investment, and growth during liberalization episodes.

Figure 1 previews the central message that the rest of this paper develops in more detail. The cost of capital falls when developing countries liberalize the stock market. Since the cost of capital falls, investment should also increase, as profit maximizing firms drive down the marginal product of capital to its new lower cost. Figure 2 is consistent with this prediction. Liberalization leads to a sharp increase in the growth rate of the capital stock. Finally, as a direct consequence of growth accounting, the increase in investment should generate a temporary increase in the growth rate of output per worker. Figure 3 confirms that the growth rate of output per worker rises in the aftermath of liberalization.

While the figures do no harm to the efficiency view of capital account liberalization, a number of caveats are in order. For example, it is legitimate to interpret a fall in the dividend yield (Figure 1) as a decline in the cost of capital, if there is no change in the expected future growth rate of dividends at the time of liberalization. But stock market liberalizations are usually accompanied by other economic reforms that may increase the expected future growth rate of output and dividends (Henry, 2000a,b). Because liberalizations do not occur in isolation, it is important to think carefully about how to interpret the data. Neoclassical theory provides a good starting point for framing the issues.

I. Theory

There are two components to a country's cost of capital: the risk-free rate and the equity premium. Theory suggests that both will fall when a poor country liberalizes. 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 only about the expected return and variance of their investment. Let $E[\tilde{R}_M]$ 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, $E[\tilde{R}_M]-r_f$, divided by the variance of the aggregate return on the market, $VAR(\tilde{R}_M)$. Under our assumptions, the price of risk in the small country before liberalization is a constant, T. It follows that

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

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 $E[\tilde{R}_M^*]$ denote the required rate of return on the market after liberalization and let $E[\tilde{R}_W]$ 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: (1) the beta of the domestic stock market with the world stock market, β_{MW}, and (2) the world risk premium, $E[\tilde{R}_W]-r_f^*$. Following liberalization it must be the case that

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

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 $(E[\tilde{R}_W]-r_f^*) = \mathrm{T}VAR(\tilde{R}_W)$. 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:

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

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

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

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, $Cov(\tilde{R}_M, \tilde{R}_W)$, the covariance of the local market with the world market, is less than $Var(\tilde{R}_M)$, the variance of the local market (Stulz, 1999). Hence the second term is also negative. The central result follows: Liberalization reduces the cost of capital.

II. Evidence

Identifying liberalization dates is the first step in examining the evidence. In principle, identifying liberalization dates simply involves finding the date on which the government declares that foreigners may purchase domestic shares. In practice, the liberalization process is not so transparent. In many cases, there is no obvious government policy decree to which one can point. When there is no salient liberalization decree, I infer the date on which foreigners could first hold domestic shares by determining the first date on which a closed-end country fund was established. Figures 1 through 3 are based on liberalization dates from 18 countries:

Argentina, Brazil, Chile, Colombia, India, Indonesia, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, The Philippines, Taiwan, Thailand, Turkey, Venezuela, and Zimbabwe.

Stock market liberalizations may seem like a narrow way to define capital account liberalization relative to the broader liberalization indicators that are employed elsewhere in the literature (Edison, Klein, Ricci and Sloek, 2002). But it is precisely the narrowness of stock market liberalizations that make them more useful for the purpose at hand. Studies that use broad liberalization indicators focus on cross-sectional data, examining the long-run correlation between average openness and average investment. Examining the correlation between average openness and investment tells us whether investment rates are permanently higher in countries with capital accounts that are more open. The problem with this approach is that neoclassical theory makes no such prediction.

What the theory does predict is that capital-poor countries will experience a temporary increase in investment when they liberalize. Hence, the relevant issue is not whether countries with open capital accounts have higher investment rates, but whether investment increases in the immediate aftermath of liberalizations. The most transparent way of testing the prediction is to compare investment rates during liberalization episodes with investment rates during non-liberalization periods. Because they constitute a radical shift in the degree of capital account openness, stock market liberalizations provide ideal natural experiments for confronting the theory with data.

A. Cost of Capital

Having identified dates on which liberalizations occur, the key question is how to detect empirically whether the cost of capital falls. The cost of capital is the equilibrium-required rate

of return on the stock market. Therefore, if liberalization reduces the cost of capital, we should see a one-time revaluation of stock prices when liberalizations occur (Henry, 2000a). For the descriptive exercise here, it is more convenient to use annual dividend yields.

Again, Figure 1 is consistent with the view that liberalization reduces the cost of capital. The figure plots the average aggregate dividend yield across the 18 liberalizing countries in event time (year [0] is the year of liberalization). The average dividend yield falls by roughly 240 basis points—from an average level of 5.0 percent in the 5 years prior to liberalization to an average of 2.6 percent in the five years following liberalization.

Figure 1 is, of course, also consistent with other interpretations. Recall that the dividend yield equals the required rate of return on equity minus the expected growth rate of dividends:

$$\frac{D}{P} = E[\tilde{R}_M] - g \qquad (5).$$

Section I explains why liberalization reduces $E[\tilde{R}_M]$. Here, the variable under scrutiny is g, the expected growth rate of dividends. If g does not change when liberalizations occur, then a fall in the dividend yield implies a fall in the cost of capital. Because liberalizations are part of a general process that involves substantial macroeconomic reforms, however, there is a strong possibility that they are associated with changes in g. Economic reforms do have significant effects on the stock market (Henry, 2002). But the financial effects of liberalization remain statistically and economically significant, after controlling for contemporaneous reforms (Henry 2000a, Bekaert and Harvey, 2000).

B. Investment

If liberalizations reduce the cost of capital then we should also see more investment. Figure 2 shows that the growth rate of the capital stock rises by 1.1 percentage points in the

aftermath of liberalizations— from an average of 5.4 percent per year in the pre-liberalization period to an average of 6.5 percent in the post-liberalization period— but Figure 2 is subject to the same criticism as Figure 1. Does investment increase because liberalization reduces the cost of capital? Or, is the entire effect driven by a reform-induced rise in g? Investment does increase following major reforms, but the effect of liberalization on investment remains significant, after controlling for reforms (Henry, 2000b).

C. Growth

Since the growth rate of the capital stock increases, the growth rate of output per worker should also rise. Figure 3 confirms that the growth rate of output per worker rises by 2.3 percentage points— from an average of 1.4 percent per year in the pre-liberalization period to an average of 3.7 percent per year in the post-liberalization period. On the one hand, there is nothing surprising about Figure 3. Whereas Figures 1 and 2 document behavioral responses of prices and quantities of capital to liberalization, Figure 3 simply provides a mechanical check of the standard growth accounting equation:

$$\hat{Y} = \hat{A} + \alpha\hat{K} + (1-\alpha)\hat{L} \qquad (6)$$

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

The interesting point about Figure 3 is that the increase in the growth rate of output per worker is too large to be explained by the increase in investment. 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 2, we would expect the growth rate of output per worker in the post-liberalization period to be about 0.363 (0.33 times 1.1) percentage points higher. But Figure 3 displays a 2.3 percentage point increase in the growth rate of output per worker. All else equal, a

1.1 percentage point increase in the growth rate of the capital stock can produce a 2.3 percentage point increase in the growth rate of output per worker only if the elasticity of output with respect to capital is on the order of 2!

Bekaert, Harvey, and Lumsdaine (2001) find that the increase in growth due to liberalization is slightly larger than 1 percentage point after controlling for a number of variables. Nevertheless, their finding still requires an elasticity of output with respect to capital that is greater than 1. Their paper does not address the inconsistency of their finding with standard production theory. I do so here.

The missing piece is, of course, Total Factor Productivity (TFP) growth. Equation (6) 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 technology. In the current context, it is important to remember that the pure 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 (Chari and Henry, 2002a; Gourinchas and Jeanne, 2002). But if theories of capital account liberalization cannot explain the increase in TFP growth, what can?

III. Open Questions

The simplest answer is that the economic reforms, which make it difficult to interpret the fall in the dividend yield as a decrease in the cost of capital, are also responsible for the increase in TFP growth. 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.

The argument is not that capital account liberalization-based theories are utterly incapable of explaining increases in TFP growth. To the contrary, one can tell augmented stories in which capital account liberalization does induce technological change. For example, liberalization may ease binding capital constraints, thereby enabling firms to adopt technologies that they could not finance prior to the liberalization. It is also possible that increased risk sharing encourages investment in riskier, higher growth technologies in the spirit of Obstfeld (1994).

The point is that the developing countries in this sample may have increased their rate of adoption of new production technologies during the late 1980s and early 1990s but, if that is the case, it is not immediately apparent from aggregate data (Figures 1 through 3). In contrast, aggregate data are completely consistent with the preponderance of readily observable evidence that the countries engaged in substantial economic reform. Occam's razor argues for the simple, reform-driven explanation of TFP growth over more elaborate capital-account-liberalization-based stories.

Having said that, the only way to completely resolve the issue is to confront it with data that are capable of distinguishing between competing theories. Recent studies of liberalization that move from aggregate to firm-level data show the way forward. For example, Chari and

Henry (2002b) provide evidence that liberalization does increase risk sharing. Examining whether the increase in risk sharing induces firms to adopt new production technologies would provide a direct test of capital-account-liberalization-based explanations of TFP growth.

IV. Conclusion

When developing countries liberalize the stock market, their cost of capital falls, investment booms, and the growth rate of output per worker increases. While the facts cast doubt on the view that capital account liberalization brings no real benefits, there are many important questions to which the evidence does not speak. For some of these questions, such as do liberalizations cause crises, aggregate data may yet prove useful. For other questions, aggregate data are simply too coarse to provide precise answers. Moving the technological frontier to firm-level data should enhance our general understanding of the process by which the effects of liberalization are transmitted to the real economy.

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Endnotes

* Stanford University and NBER. I am grateful for financial support from an NSF CAREER Award and the Stanford Institute of Economic Policy Research (SIEPR). I thank Sandy Darity, John McMillan and Linda Tesar for comments. This paper is a condensed version of my NBER working paper with the same title.

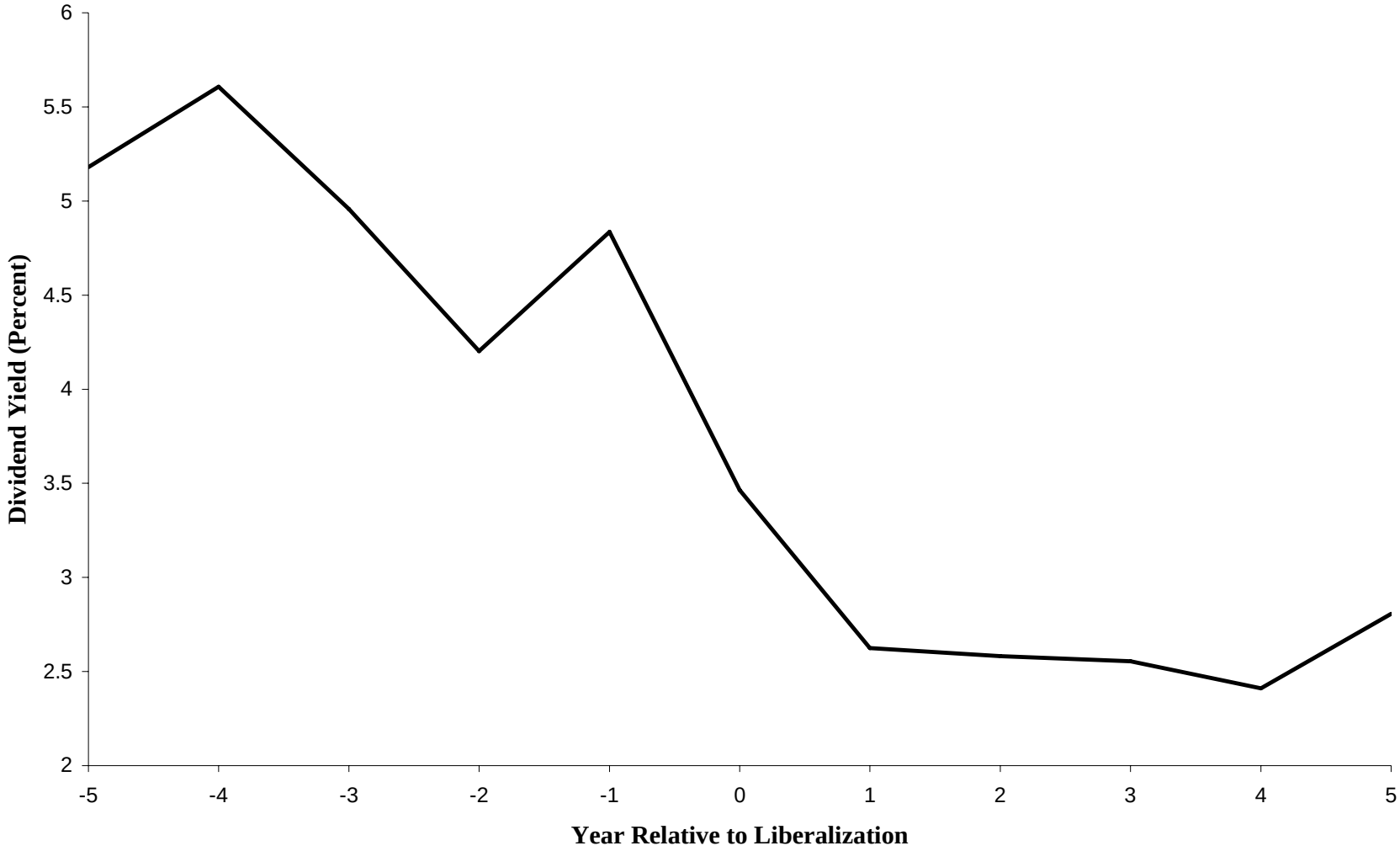

Figure 1. The Cost of Capital Capital Falls When Countries Liberalize the Capital Account.

Figure 2. Investment Booms When Countries Liberalize the Capital Account .

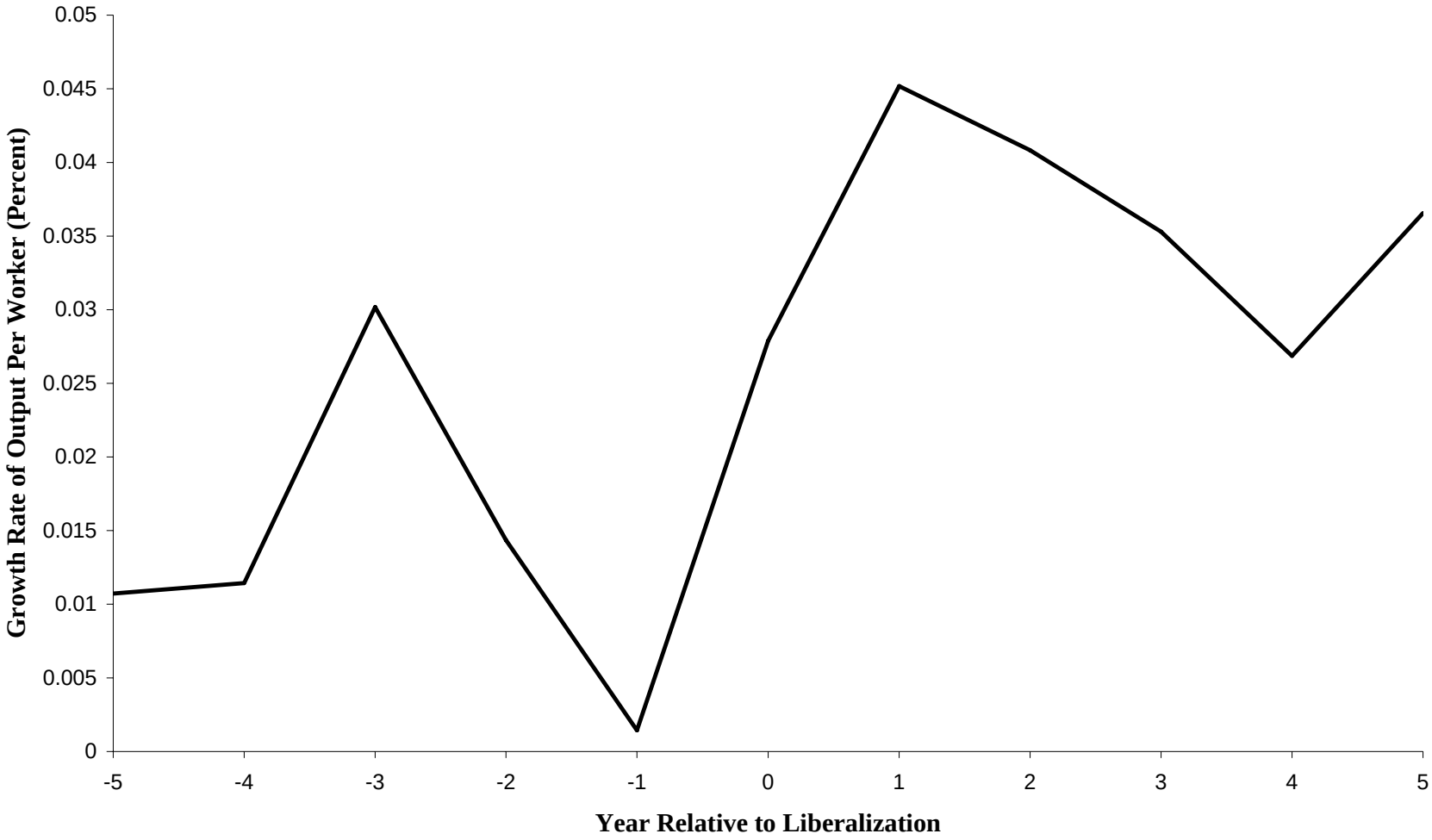

Figure 3. The Growth Rate of Output Per Worker Increases When Countries Liberalize