Financial Integration, Financial Development and Economic Growth

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Comments Welcome

Abstract

This paper analyzes the relationship between international financial integration and economic growth. Recent literature, surveyed in this paper, emphasizes the role of financial deepening on economic growth. Less attention has been paid, however, to the role of international financial integration in promoting a deep domestic financial market and through that channel fostering economic growth. Financial integration also permits portfolio diversification, allowing higher profitability of investment and, hence, higher rate of economic growth. Those issues are examined in this paper. In particular, after reviewing the theory and evidence, this paper analyzes empirically the relationships between financial integration and financial development, and between financial development and economic growth.

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1 Introduction

In recent years there has been a large literature highlighting, at both theoretical and empirical level, the importance of having a deep financial system to promote economic growth. This literature emphasizes the allocative effects of financial markets, by which they are able to allocate investible funds into their most profitable uses. At the same time, by pooling risk, financial markets are able to smooth consumption of individuals having volatile income. Thus, portfolio diversification allows stable consumption, while investible funds can be allocated to high-risk high-return activities.

More recently, recent research has looked at these issues from an open economy point of view. Financial integration with the world economy may bring similar benefits to those associated with financial deepening. Indeed, one could think that international financial markets may channel funds to profitable investment activities, and portfolio diversification in the world may smooth consumption of households allowing the economy to improve profitability of investment.

These issues are not merely academic questions. On the one hand it is necessary to know whether developing a deep financial market may be fostered by international financial integration. On the other hand, and in more practical terms, financial reforms in developing countries are usually accompanied by an opening of the capital account, by which domestic financial markets become not only more competitive, but also more integrated with the rest of the world.

This paper examines the relationship between financial integration and financial development and the relationship between financial integration and economic growth.

For this purpose, the next section discusses the theoretical and empirical literature on financial development and economic growth. The theoretical prediction, discussed in section 2, of a positive relationship between financial development and growth is confirmed by the empirical evidence. Then, in section 3 the issue about portfolio diversification and consumption smoothing, and their consequences on economic growth, are discussed.

Sections 4 and 5 present the empirical evidence. In section 4, after describing the data, the relationship between financial integration and financial development is examined. The results support the view that increased financial integration increases the depth of the banking system as well as the stock market. Then, in section 5 the relationship between financial integration and economic growth is evaluated empirically. Finally, section 6 concludes with some few final remarks.

2 Overview on Financial Development and Growth

This section surveys some recent literature that examines the effects of financial development on economic growth, both at the theoretical and the empirical level.[1]

2.1 Theory

Economic growth may come from the following two channels: growth in the amount of factors of production or increases in the efficiency with which those factors are used. In other words, growth is induced by the increase in investment (accumulation of capital) and the efficiency of investment.

In a closed economy investment is equal to savings, and this is why savings is viewed as an important vehicle to increase growth.[2] The efficiency of investment, in turn, includes not only total factor productivity growth, but also the accumulation of other factors not included in physical capital, and hence, not included in standard measures of investment. This becomes important as new theories of economic growth emphasize that we should look at a broader

[1] For other overviews of the empirical and theoretical literature see De Gregorio and Guidotti (1995), Fry (1993), Greenwood and Smith (1993), Pagano (1993), and King and Levine (1993), and specially Levine (1997).

[2] To simplify the discussion I consider the economy to be closed, so investment equal savings. It could be assumed that the economy is open and there is in addition an upward sloping-supply of funds (Fry, 1993) or some other form of imperfect capital mobility such as the lack of collateral to obtain foreign financing for human capital accumulation (Barro, Mankiw and Sala-i-Martin, 1995). In all of these cases higher national savings would encourage capital accumulation, and the implications for growth would be qualitatively similar to those of the closed economy.

concept of capital, rather than simply equipment and buildings. We should also include human capital, organizational capital, information, etc.

Financial development has a dual effect on economic growth. On the one hand, the development of domestic financial markets may enhance the efficiency of capital accumulation. On the other hand, financial intermediation may contribute to raising the savings rate and, thus, the investment rate. The former effect was first emphasized by Goldsmith (1969), who also finds some positive correlation between financial development and the level of real per capita GNP. In addition, Goldsmith (1969) also argues that the process of growth has feedback effects on financial markets by creating incentives for further financial development.

McKinnon (1973) and Shaw (1973) extend the earlier argument by noting that financial deepening implies not only higher productivity of capital but also a higher savings rate and, therefore, a higher volume of investment. Unlike Goldsmith (1969), where growth and financial intermediation are both thought of as endogenous, the focus of McKinnon (1973) and Shaw (1973) is on the effects of public policy regarding financial markets on savings and investment. In particular, McKinnon (1973) and Shaw (1973) argue that policies that lead to financial repression—for example, controls which result in negative real interest rates—reduce the incentives to save. Lower savings, in turn, result in lower investment and growth. Thus they conclude that higher interest rates resulting from financial liberalization induce households to increase savings. The empirical validity of the McKinnon-Shaw hypothesis has been challenged by various authors. Díaz-Alejandro (1985), for instance, argues that the Latin American experience shows that financial deepening is unlikely to increase savings; therefore, the main contribution of financial deepening to growth should be thought of as increasing the marginal productivity of capital, rather than the volume of savings and investment.

Recent theoretical work has incorporated the role of financial factors in models of endogenous growth in an attempt to analyze formally the interactions between financial markets and long-run economic growth. Greenwood and Jovanovic (1990) present a model in which both financial intermediation

and growth are endogenous.[3] In their framework, the role of financial institutions is to collect and analyze information to channel investible funds to the investment activities that yield the highest return. Since the activity performed by financial intermediaries involves costs, Greenwood and Jovanovic (1990) show that there is a positive two-way causal relationship between economic growth and financial development. On the one hand, the process of growth stimulates higher participation in financial markets thereby facilitating the creation and expansion of financial institutions. In the model, agents need to pay a fixed cost to create a financial intermediary, and hence, the cost as a fraction of income declines as growth proceeds. On the other hand financial institutions, by collecting and analyzing information from many potential investors, allow investment projects to be undertaken more efficiently and, hence, stimulate investment and growth.

Bencivenga and Smith (1991) present a model in which individuals face uncertainty about their future liquidity needs. They can choose to invest in a liquid asset—which is safe but has low productivity—and/or an illiquid asset—which is riskier but has high productivity. In this framework, the presence of financial intermediation increases economic growth by channelling savings into the activity with high productivity, while allowing individuals to reduce the risk associated with their liquidity needs. Although individuals face uncertain liquidity needs, banks, by the law of large numbers, face a predictable demand for liquidity and can, therefore, allocate investment funds more efficiently. In the absence of financial intermediaries, individuals may be forced to liquidate their investment (i.e., their savings held in illiquid assets) when liquidity needs arise. Thus, the presence of banks also provides the benefit of eliminating unnecessary liquidations. Interestingly, Bencivenga and Smith (1991) show in their model that growth increases even when aggregate savings are reduced as a result of financial development, the reason being the dominant effect that financial development has on the efficiency of investment.

Along similar lines, Levine (1992) analyzes the effects of alternative financial structures on economic growth. In his model, financial institutions raise

[3]See also Greenwood and Smith (1993).

the fraction of total savings devoted to investment and avoid premature liquidations of capital. Banks, stock markets, mutual funds, and investment banks enhance growth by promoting the efficient allocation of investment through various channels.

In a somewhat different approach, Roubini and Sala-i-Martin (1992) analyze the relationship between financial intermediation and growth by emphasizing the role of government policy. In particular, they develop a model in which financial repression becomes a tool that governments may use to broaden the base of the inflation tax. Thus financial repression yields higher seigniorage to finance government expenditures. In an optimal taxation framework where the tax instruments at the government's disposal are the inflation tax and an income tax that is subject to tax evasion, Roubini and Sala-i-Martin (1992) show that high income tax evasion induces policymakers to repress the financial system and set a high inflation rate in an attempt to generate higher revenues from the inflation tax. Since financial repression reduces the productivity of capital and lowers savings, it hampers growth.

From a different perspective Jappelli and Pagano (1994) analyze the effects of financial market developments on the savings rate. They concentrate attention on the effect of borrowing constraints—that is, the inability of individuals to borrow freely against future income—on economic growth. This work shifts the focus from the effects of financial markets on the production side of the economy to their effects on household behavior. A conclusion from this study is that the full or partial inability of individuals to borrow against future income induces them to increase savings. The reason is that when individuals are unable to borrow, they must build up financial wealth by increasing savings in order to finance current consumption. Thus, this study suggests that financial deepening on the side of consumer credit is unlikely to increase savings. This result is consistent with casual observation in Latin America, where episodes of financial liberalization have not increased savings rates.

The implication from Jappelli and Pagano (1994) that the relaxation of borrowing constraints is unlikely to stimulate savings does not necessarily imply that such a form of financial deepening will result in lower growth. De

Gregorio (1996), in fact, suggests that the relationship between borrowing constraints and growth will ultimately depend on the importance of the effect of borrowing constraints on the marginal productivity of capital relative to their effect on the volume of savings. In particular, De Gregorio (1996) shows that a relaxation of borrowing constraints increases the incentives for human capital accumulation. This effect is likely to increase the marginal product of capital and, hence, may lead to higher growth despite the reduction in savings.

2.2 Empirical evidence

Recent empirical studies on financial development and growth are based on regression analysis for large cross-sections of countries, following the important work of Barro (1991).

The basic equation is:[4]

$$\gamma_i = \alpha_0 + \alpha_1 FD_i + \alpha_2 X_i + \nu_i \tag{1}$$

where γ_i is the rate of growth of country i, FD is an indicator of financial development, X a set of other determinants of growth, and ν an error term. The set of variables X usually contains the initial level of GDP to control for conditional convergence, indices of the level of education, government expenditure, macroeconomic indicators, indices of political stability and protection of property rights, etc.

Several indicators of financial development have been proposed in the literature. Of course, different indicators will proxy different aspects of the relationship between the financial system and economic performance. Initially, the indicators were based on monetary aggregates, such as M1 or M2. However, as argued in De Gregorio and Guidotti (1995), they may provide a poor proxy of financial development, since they are more related to the ability of financial systems to provide transaction services, and not necessarily the ability of financial intermediaries to channel funds from savers to borrowers. Indeed, it is possible that economies with poorly developed financial systems

[4]See Barro and Sala-i-Martin (1995) for further discussion on the empirical evidence on growth determinants and convergence.

be highly monetized, because money may be used as a store of value in the absence of other, more attractive, alternatives. For this reason, authors such as Gelb (1989) and King and Levine (1993) use M3, which is also called liquid liabilities. Estimating (1) using liquid liabilities (LLY) as indicator of financial development, for the period 1960–89, gives the following result (King and Levine, 1993):

$$\begin{aligned} \gamma_i &= 0.024\ LLY_i + others \\ &\quad (2.67) \end{aligned} \tag{2}$$

$R^2 = 0.50$, N obs. $= 77$, and t-statistics in parenthesis.

The coefficient of 0.024 "suggests that a country that increased liquid liabilities from the mean of the slowest growing (0.2) to the mean of the fastest growing quartile of countries (0.6) ... would increase its growth rate by almost 1 percent per annum. Since the difference between the very fast and the very slow growers is about 5 percent, the rise in LLY alone would eliminate 20 percent of this difference" (King and Levine, 1993, p. 728).

Although using liquid liabilities overcome some shortcomings of using narrower definitions of money, they may still be influenced by factors other than financial depth, since M3 still includes M1. For this reason Neal (1988) have relied on indicators of quasi-liquid liabilities by subtracting M1 from M2, and along similar lines King and Levine (1992) have subtracted M1 from M3. The former authors have concluded that the results do not change significantly when using M3 or M3-M1, because M1 is a small fraction of liquid liabilities.

De Gregorio and Guidotti (1995), and King and Levine (1993) use, alternatively, the ratio of domestic credit to the private sector to GDP as a proxy for the degree of financial intermediation. It corresponds to credit granted to the private sector by the central bank and commercial banks (line 32d from the International Monetary Fund's International Financial Statistics), as a fraction of GDP, and it will be denoted as CREDIT in what follows.[5] The main advantage of this indicator over other monetary aggregates is that because it

[5]The results are also very similar when credit form the central bank is excluded.

excludes credit to the public sector, it represents more accurately the role of financial intermediaries in channelling funds to the private sector. Thus, this is the definition of financial intermediation that should be more closely related to the degree of financial intermediation, which should ultimately affect investment as well as the efficiency of investment.

This measure is, however, only a partial indicator of financial development. It is a good indicator of financial development that occurs through the banking system, but may be a weak indicator of financial development that occurs outside the banking system, e.g., stock markets. This weakness may be more relevant in industrialized countries, which have experienced significant non-bank financial innovation. In developing countries, in contrast, most financial development has occurred within the banking system. Nevertheless, the use of CREDIT as indicator of financial development fits our purposes of analyzing the role of banks on development.

Using Barro (1991) dataset for the period 1960-85, De Gregorio and Guidotti (1995) find the following result when using CREDIT to proxy for the degree of financial development:[6]

$$\begin{aligned} \gamma_i &= 0.024\ CREDIT_i + others \\ &\quad (3.58) \end{aligned} \tag{3}$$

$R^2 = 0.54$, N obs. $= 95$,

which again reveals the importance of financial deepening on economic growth.

Next, it is important to disentangle how much of the effect of financial development on growth is through increasing investment, and how much through increasing the efficiency of investment. To examine this issue, equation (3) can be estimated including the investment rate (INV) in the set of other variables. After controlling for investment, the coefficient on CREDIT would capture the effect of financial development on the efficiency of investment. In contrast, the

[6]De Gregorio and Guidotti (1995) also report a negative correlation between CREDIT and growth in the 1970s and early 1980s in Latin America. This is explained mainly by the lack of supervision of the banking system in a period of accelerated liberalization and by serious macroeconomic imbalances. This issues will not be discussed further in this paper.

coefficient in (3) represents the total effect of CREDIT on growth. The equation that includes investment is:

$$\begin{array}{rcccccc} \gamma_i & = & 0.018\, CREDIT_i & + & 0.066\, INV_i & + & others \\ & & (2.30) & & (1.90) & & \end{array} \tag{4}$$

$R^2 = 0.57$, N obs. $= 95$.

The coefficient on CREDIT declines from 0.024 to 0.018 when investment rates are included. This suggests that approximately three-fourths of the effect of CREDIT on growth is transmitted by increasing the efficiency of investment, while only one-fourth is transmitted through an increase in investment. Thus, this finding supports the hypothesis, confirmed by most of the theoretical literature, that financial intermediation affects growth mainly by increasing the marginal productivity of capital.

Finally, it has to be noticed that banking development is relatively more important at early stages of development (De Gregorio and Guidotti (1995)). As we already saw increasing CREDIT is positively associated with growth, with a coefficient of 0.024 in regression (3). The sample can be decomposed in three roughly equally-sized groups of countries, ordered according to the level of income, to examine whether the importance of banking changes with the degree of development. In the sample of high-income countries the coefficient on CREDIT declines to 0.015, while the in the sample of middle-income countries the coefficient is 0.054, and finally, in the sample of low-income countries the coefficient reaches its maximum equal to 0.146. Thus, the coefficient on CREDIT increases tenfold when going from high- to low-income countries.

This finding should not be surprising as many have noted that in industrialized countries financial innovation has occurred mostly outside the banking system. This is confirmed when the analysis is restricted to the period 1970–85, where actually occurred the boom of non-banking innovation. In this case the coefficient on CREDIT for high-income countries becomes insignificantly different from zero. For middle- and low-income countries the coefficients also decline when the sample is restricted to 1970–85, but they are still positive and largest in the case of low-income countries.

3 Financial Opening and Portfolio Diversification

As discussed in the previous section, financial intermediaries provide individuals with a more diversified portfolio. Thus, an Argentinean investor could be able to invest in a Malaysian firm, which presumably have profits uncorrelated with Argentina's stock market. Consequently, individuals would be able to achieve a more stable (smooth) consumption path. At the same time, individuals, by protecting themselves against risk, can invest in activities with more risk, but with a higher yield. Thus the final portfolio could be more profitable.

For the ensuing discussion I will first focus on the benefits of reducing the volatility of consumption via financial integration. Then, I turn to the issue of the potential growth effects stemming from risk-sharing.

The canonical case to assess the effects of reduced volatility of consumption has been illustrated by Lucas (1987). He considers an economy populated by a representative consumer that maximizes the following utility function:

$$U_0 \equiv \max \mathrm{E}\left[\sum_{t=0}^{\infty} (c_t^{1-\sigma} - 1)/(1-\sigma)\right] \tag{5}$$

where $\beta \in (0,1)$ is the discount factor and σ the constant coefficient of risk aversion. This coefficient is also the inverse of the intertemporal elasticity of consumption. Consider an individual that has a consumption path growing at a deterministic rate equal to γ and is subject to stochastic shocks. That is,

$$c_t = c_0(1+\gamma)^t \epsilon_t \tag{6}$$

where ϵ_t denotes the random variable, that is distributed with mean 1 and variance s^2. The value of U_0, the maximized utility, will depend on c_0, γ and s^2. Because the utility function is concave, utility increase with c_0, and γ, but decreases with s^2. The question is, then, how much the individual is willing to pay in terms of c_0 in order to reach the same level of utility U_0, but reducing the variance of consumption to zero, and thus having a perfectly smooth path of consumption. To find the solution it is necessary to replace (6) into (5), compare the values of U_0, and then set c_0 such that in both cases utility is the

same. It can be shown that, after an appropriate approximation, the individual would be willing to pay at most $s^2\sigma/2$ percent of current consumption in order to smooth consumption.

The main conclusion from Lucas (1987) is that the gains from consumption smoothing are very small, and indeed, calibrating for plausible values for the US economy, he concludes that the gains are about one tenth of 1 percentage point of increased consumption, which is certainly a small number.

Although this framework has been primarily used to assess the benefits from stabilization policies, it can also be used to evaluate the benefits of world trade in financial assets. This analysis started with Cole and Obstfeld (1991). They build a two-country economy, where output shocks leads, in addition to direct effects on consumption, to changes in terms of trade that automatically pool output shocks, since the country that is shocked by a positive productivity shock (in exports) will face a terms of trade deterioration. Calibrating this model, and considering the offsetting effect coming from terms of trade fluctuations, for the US and Japan, they conclude that the gains from eliminating a ban on portfolio diversification would produce a benefit of at most 0.2 percent of output per year. As in Lucas (1987), the welfare gains from consumption smoothing, through trade in international financial assets, are small. The finding that the calibrated gains are relatively small have been used as an explanation of the "home bias" in international portfolio diversification, reported, for example, in French and Poterba (1991). They indicate that US investor hold more than 90% of their equity portfolio in US stocks, while Japanese investors hold more than 90% of their portfolio in Japanese stocks. Therefore, there is a tendency of domestic agents to hold a portfolio heavily bias toward domestic equities, while a non-biased portfolio should be hold by any individual, regardless of her nationality.

To generate higher welfare gains from international risk-sharing there are a number of technical assumption that can be relaxed from the original Lucas' (1987) analysis. A leading example is to break the tight relationship between the risk-aversion parameter of the utility function and the respective intertemporal elasticity of substitution.

There are, however, at least two important extensions that need to be considered when extending the analysis Lucas (1987) and Cole and Obstfeld (1991) to judge the benefits of financial opening in developing countries. First, the previous analysis considers two developed economies, where output fluctuations are small and highly correlated, so the scope for consumption smoothing through risk-sharing is limited. Second, they do not consider that portfolio diversification could produce also an increase in the rate of growth of the economy, amplifying substantially the welfare gains.

In a couple of papers, van Wincoop (1994a, b) has addressed the first issue, namely, the effects of risk-sharing among countries and regions whose consumption levels are not highly correlated. In the analysis for consumption data of 20 OECD countries, van Wincoop (1994a) shows that there are indeed large unexploited gains from risk-sharing, which amounts to a permanent increase in consumption between 1.7% and 5.6%. The standard deviation of the rate of growth of consumption of tradable goods for a typical OECD country is about twice the average rate of growth of tradables consumption for the aggregate of OECD countries. These results are robust to changes in the specification of preferences and the parametrization of the model. The main differences with Cole and Obstfeld (1991), are that they use a very high riskless interest rate, risk-sharing is restricted to only two countries, and shocks are more persistent.

Saint Paul (1992) and Obstfeld (1994) consider another important extension, which is the growth effects of allowing international trade in assets. There is a positive effects on consumption smoothing, which spillovers to the productive decision of firms. Thus, the static welfare gains from consumption smoothing are magnified by the growth effects. This literature reinforces the growth effects of financial development in financially open economies.

Changing the composition of portfolio is the main mechanism in Obstfeld (1994). He shows that international diversification of risk allows the world economy to shift portfolio from low-risk low-return investment to higher-risk high-return investment, which ends up increasing the rate of growth. International financial integration allows each country to hold a globally diversified

portfolio for risky capital.

Saint-Paul (1992) develops a model where financial markets affect technological choice. In this model, agents can choose between two technologies: One technology is highly flexible and allows productive diversification, but has low productivity; the other is rigid, more specialized, and more productive. The economy is exposed to shocks to consumer preferences, which may result in a lack of demand for some products. Therefore, in the absence of financial markets risk-averse individuals (consumer-producers) may prefer technological flexibility rather than high productivity. Financial markets, in contrast, allow individuals to hold a diversified portfolio to insure themselves against negative demand shocks and, at the same time, to choose the more productive technology.

To study in greater detail the effects of international risk-sharing I develop a simple model in the spirit of Saint Paul (1992). Consider two countries, 1 and 2, and two goods, 1 and 2. Country 1 produce x of good 1 and y of good 2. Country 2, produces x^* of good 1 and y^* of good 2. To simplify technology I assume that if country 1 does not specialize produces $x = q$ and $y = 1 - q$, while country 2 produces $x^* = q$ and $y^* = 1-q$, where $q > 1/2$. Thus, I assume implicitly that production of each good is unitary, and that country i is more efficient at good i. In addition, countries can benefit from specialization, due to, for example, economies of scale. Thus, if country 1 specializes in good 1 it can produce $x = Q > 1$, while country 2 could produce $y^* = Q$ of good 2.

Households are the owners of firms, and the receive as dividend the production of firms. Consumers engage in asset trading in period 1, and production takes place. In period 2, a preference shock is realized and only good 1 (with probability 0.5) or good two (with probability 0.5) is demanded. Utility for consuming an amount z of either good is $u(z)$.

In a closed economy, if country 1 specializes in good 1, production will be Q of good 1 and zero (or perhaps something very small) of good 2. Expected utility, normalizing the number of consumers to 1, will be $U_a = [u(Q)+u(0)]/2$. However, if local production is diversified, expected utility will be $U_b = [u(q)+ u(1-q)]/2$. In general, given concavity of the utility function and the extent

of scale economies, we would expect that the economy will not specialize, and households in country 1 will have expected utility of U_b. Now, assume that households can hold shares of foreign companies is s, so the economy is open to international trade in assets and goods. If the share of portfolio held in domestic companies, expected utility will be $U_c = [u(sx + (1-s)x^*) + u(sy + (1-s)y^*)]/2$. Two results emerge clearly from this setup: first, countries will specialize to maximize production, that is $x = Q$, $y^* = Q$, and $x^* = y = 0$. Second, individuals will hold a balanced portfolio with $s = 1/2$. Thus, utility will be $U_c = [u(Q/2) + u(Q/2)]/2$, which can be easily shown to be greater than U_a, and U_b. Therefore, in general, we have that $U_c > U_b > U_a$.

Two important conclusions emerge from this analysis. First, individuals are able to smooth consumption across states of the nature when they are able to trade in international assets. And second, the inability of individuals to protect themselves against risk through asset trading may lead them to bad (second-best) productive decisions. Indeed, in this example, the inability to trade assets internationally leads them to suboptimal specialization. Thus, risk-sharing reduces the risk associated with consumption: the variance of consumption is $(q - 1/2)^2$ across states of nature in the closed economy, while it is zero in the open economy. On the other hand there is a production effect, which increases the expected value of consumption from $1/2$ in the closed economy to $Q/2$ in the open economy.

From an applied point of view it still remains to know whether the gains from portfolio diversification are relevant, or just small variations from Lucas (1987). We already saw that the van Wincoop (1994a) has already computed a welfare gain from pure risk-sharing, without growth effects, equivalent to a permanent increase in consumption between 2% and 5%. The calibrations in Obstfeld (1994) show much larger figures. Table 1 shows the potential gains from risk-sharing. The countries arranged in the horizontal direction of the table, are all the groups of countries where the rate of growth of consumption is smaller than the standard deviation of this rate of growth. Besides South America, they are countries with low growth of consumption. Just by looking at the first and second moments of the distribution of consumption growth it

should be clear that the countries that have most to gain from international risk-sharing are developing countries. They could increase growth, but also reduce the variance of consumption. This could be achieved because the correlation of consumption in volatile developing countries with consumption in industrialized countries plus East Asia is low. Indeed, in many cases the correlation is negative and it is at most 0.44 for the case of South America and Northern Europe. In effect, the baseline calibrations of Obstfeld (1994)—which certainly overstate the actual gains but illustrate clearly the differences—show that, in average, developing countries could gain 370% of initial wealth from financial integration, while countries arranged in the vertical direction of table 1 could gain in average 77% of wealth, being the lowest East-Asia (22%).

Table 1: **Cross-correlation of Consumption**

$\{g_c$ - $\sigma_{g_c}\}$	South America {3.11 - 4.57}	Central America {1.68 - 2.96}	Africa {1.31 -3.59}	Asia Non-East {0.91 - 3.02}
North America {2.35 - 1.76}	-0.248	-0.113	-0.415	0.117
Northern Europe {2.87 - 1.31}	0.440	0.289	-0.035	-0.299
Southern Europe {3.13 - 3.03}	0.391	0.115	0.321	-0.166
East Asia {3.64 - 2.12}	0.134	0.365	0.074	-0.299

Source: Obstfeld (1994).
g_c is average annual rate of consumption growth, 1960-87.
σ_{g_c} is standard deviation of consumption growth.

The main reason to have those large welfare gains are the growth effects of full financial integration. Indeed, consumption growth would rise to 4.4% a year, even higher than the maximum in the actual calculations, that is East Asia with 3.6%. This sharp increase comes from a drop in the consumption-to-wealth ratio (increase in savings), but primarily from a shift of world wealth into riskier high-yield capital. Simulations also show that even if savings fall, the allocation effect dominates and would result in welfare gains from integration.

Of course, the potential welfare gains are mainly illustrative, since the model has several shortcuts to reach tractable results. For example, assuming that there are adjustment costs and capital cannot reallocate instantly, could reduce to about a third the above mentioned welfare gains. Finally, the model does not incorporate nontradable goods, and therefore, changes in the real exchange rate.

Overall, although the literature provides a wide range of estimates for the benefits of financial integration on welfare due to portfolio diversification, it is reasonable to conclude that once growth effects are included the welfare gains for developing countries could be much higher than those associated with industrialized countries. It is still puzzling, why such diversification has not already been taking place. As van Wincoop (1994a) has called it, there is still an "international risksharing puzzle."

4 Financial Integration and Financial Development

In recent years there has been an explosion of cross-country analysis of growth determinants. In particular, for our purposes, it has been established that a deep financial market leads to higher growth, as reviewed in section 2. The issue I want to examine in this section is whether a high degree of financial integration leads to an increasing degree of financial development. In particular, this section attempts to answer the following question:

- Do countries more integrated to world financial markets have deeper financial systems?

If this connection exists, then it would follow that financial integration has an indirect effect on economic growth through the promotion of financial development.

4.1 Data

The first problem faced to do empirical work is to obtain good indicators of financial integration. As it was already discussed in the review of the existing

empirical evidence there are several indicators for financial development, but it is more difficult to obtain indicators for financial integration. In this regard I use data produced by Montiel (1994) and Levine and Zervos (1995).

After having examined a wide variety of indicators I ended up using the following four indicators:[7]

1. IAPM (Levine and Zervos, 1995): Indicator based on the international arbitrage pricing model. To estimate this indicator, the excess return of a given asset, at a given time, above a risk free asset is regressed against the excess return on a benchmark portfolio. In the international arbitrage pricing model the benchmark portfolio is based on the common factors based on an international portfolio of assets.

   If international financial markets are perfectly integrated, there should be a constant ratio between excess return of an asset and the excess return of the benchmark portfolio, and hence there should be no intercept in a regression. Therefore, the higher the intercept, the less integrated the markets are. In order to have a measure positively correlated with financial integration, this intercept is multiplied by minus one.

2. ICAPM (Levine and Zervos, 1998): Indicator based on the international capital asset pricing model. It is very similar to IAPM, but the benchmark portfolio is constructed on a value-weighted portfolio of common stocks. IAPM and ICAPM are computed using data for the period 1976–93. For both indices Levine and Zervos (1995) compute also their value at the beginning of the estimation period, to have the initial value of IAPM and ICAPM, but the number of observations declined from 24 to 13.

3. GFR (Montiel, 1994): This corresponds to an indicator of the magnitude of gross capital flows ratio to GDP for the period 1980–89. A 1 was assigned for countries with ratio above 20 percent, 2 for countries with flows between 15 and 20 percent, 3 for a range between 10 and 15 percent, 4 for a range between 5 and 10 percent, and finally a 5 for values below 5

[7] These indicators are well explained in the papers referred above and in the references therein, and hence, I discuss them briefly.

percent. In order to have an indicator positively correlated with financial integration I multiply this indicator by minus one.

4. CLAS (Montiel, 1994): It takes a value of 3 for countries highly integrated internationally, 2 for moderately integrated countries, and 1 for low integration. It is constructed based in a series of other indicators: GFR, test results of the Feldstein-Horioka findings, on Euler equation estimations, and tests of uncovered interest parity differentials. I also used the specific components in the regression analysis, but the results were not interesting.

To compare financial integration with financial development (or depth) it is necessary a good set of indicators of financial depth. For this purpose is important to distinguish among different institutions in capital markets. In particular, a relevant distinction is between the banking system and stock markets, since they presumably interact in different forms with international financial markets. To measure financial depth the following indicators are used (all of them from Levine and Zervos (1995)):

1. CREDIT: as discussed in the previous section this is total loans made by the banking system to the private sector. This variable is a good proxy of the intermediation made by the banking system.
2. MCAP: this is the value of listed shares as a fraction of GDP. Thus, this indicates the size of the stock market. However, this is an incomplete picture of the stock market since it ignores the liquidity of the market.
3. TVT: this is the total value of shares traded in a year over GDP. Then, this is a measure of liquidity of the stock market related to the size of the economy.
4. VOL: this is a measure of volatility. Besides intermediation provided by stock markets, an important characteristic of them is their volatility, which among policymakers, and many economists, is usually thought as being excessive. For this reason it is important to analyze what is the effect of financial integration on volatility. It is measured as the twelve-month rolling standard deviation based on a regression of stock returns.

Table 2 presents cross-correlations among indicators of financial integration. The figures in square brackets are the number of observations. There are about 24 data points per proxy of financial integration, which limits the reliability of cross-section analysis. However, it is interesting to note that the sample available with the data of Levine and Zervos (1995) is different to that of Montiel (1994), since they have in common about half of data points. Thus when we change variables, we are also looking at a different sample of countries, which helps to check robustness. The main difference between the two datasets is that the first one contains some developed countries, while Montiel (1994) has only developing countries. Therefore, when using IAPM and ICAPM we will be looking at a sample of both, developing and industrialized countries. In contrast, when looking at GFR and CLAS we will be examining a sample of similar size to those based on IAPM and ICAPM, but only containing developing countries.

An additional difference is the high correlation between IAPM and ICAPM, and between CLAS and GFR, but a weak correlation, and in some cases negative, between the two groups of variables. This fact also helps to check robustness, since the indicators are not highly correlated.

Table 2: **Cross-Correlations and Summary Statistics**

	IAPM	ICAPM	CLAS	GFR
IAPM	1.00			
	[24]			
ICAPM	0.92	1.00		
	[24]	[24]		
CLAS	0.07	0.04	1.00	
	[12]	[12]	[22]	
GFR	-0.54	-0.44	0.56	1.00
	[14]	[14]	[22]	[24]
Average	-4.30	-4.08	1.86	-3.63
Stad. dev.	1.47	1.86	0.77	1.28
Min. value	-6.67	-9.98	1.00	-5.00
Max value	-2.17	-2.00	3.00	-1.00

Figures in square brackets are No. of observations.

4.2 Empirical evidence

The relationship between financial integration (FI) and financial development (FD) is presented in table 3. The table reports the results of running the following regression:

$$\mathrm{FD}_i = constant + \alpha \mathrm{FI}_i + other \;\; regressors, \tag{7}$$

for all four indicators of FD and using each one of the four indicators of financial integration as dependent variable. The table presents the estimates of the coefficient α and its t-statistic. In the regressions under the column (1) there is no other regressor. In order to include the effects that different levels of development have on the size of the financial system, regressions in columns (2) include the initial level of GDP per capita as an additional regressor.

In columns (3) two additional regressors where added: average inflation, and openness (exports plus imports over GDP). Presumably, the rate of inflation should have an effect on the development of the financial system. In general, macroeconomic conditions should affect the development of the financial system. On the one hand, high inflation may inhibit the development of the financial system by the uncertainty about financial conditions even at short horizons, but, on the other hand, one could expect that high inflation may promote the development of short term and indexed securities to hedge against inflation. One could expect that long term contracts tend to disappear in high-inflation experiences, while short term contracts and highly liquid securities tend to emerge. Although the net effect is unclear, high inflation will change maturity toward short term and liquid instruments.

Trade openness, in addition to financial integration, is the other important component of openness. All financial services involved in international transactions may promote the development of the financial system.

For the presentation of results, columns (3) report regressions only with significant coefficients for the other regressors. All regressions have between 22 and 24 observations and the R^2's are between 0.5 and 0.7 in those more general regressions.

Regarding development of the banking system (CREDIT), table 3 shows

Table 3: **Financial Integration and Financial Development**

Financial Integration Indicator	Indicator of Financial Development CREDIT (1)	(2)	(3)	MCAP (1)	(2)	(3)
IAPM	0.134**	0.122**	0.081*	0.059**	0.052**	0.040*
	(2.21)	(2.64)	(1.86)	(2.10)	(2.65)	(1.82)
ICAPM	0.106**	0.108**	0.033**	0.067**	0.063**	0.090**
	(2.72)	(3.96)	(3.64)	(2.74)	(4.25)	(5.84)
CLAS	0.239**	0.187**	0.093*	0.112	0.052	-0.070
	(3.05)	(2.66)	(1.80)	(0.96)	(0.39)	(-0.61)
GFR	0.099	0.070	-0.038	0.061	0.034	-0.083
	(1.51)	(1.14)	(-1.07)	(0.76)	(0.42)	(-1.42)
Financial Integration Indicator	Indicator of Financial Development VOL (1)	(2)	(3)	TVT (1)	(2)	(3)
IAPM	-0.026**	-0.026**	-0.008*	0.011	0.007	-0.014
	(-3.55)	(-3.45)	(-1.61)	(0.34)	(0.21)	(-0.35)
ICAPM	-0.030**	-0.030**	-0.013**	0.025**	0.026**	0.029**
	(-6.16)	(-6.27)	(-3.00)	(2.13)	(3.16)	(2.19)
CLAS	-0.056	-0.010	-0.025**	0.047*	0.036	0.003
	(-1.47)	(-1.47)	(-2.24)	(1.75)	(1.39)	(0.22)
GFR	0.006	-0.012	-0.008**	0.017	0.010	-0.023**
	(0.44)	(-1.37)	(-2.32)	(0.82)	(0.52)	(-3.33)

t statistics in parenthesis.

* and ** significant at 10% and 5%, respectively.

(1) No additional regressors.

(2) Includes initial GDP as regressor.

(3) Includes initial GDP, inflation and openness as additional regressors, when significant.

that this is the variable most affected by almost all of the indicators of financial integration. Indeed, for IAPM, ICAPM and CLAS, the coefficient is always positive and significantly different from zero. As expected, and due to the positive correlation between financial integration and per capita GDP, as well as financial opening, the coefficient declines as regressors are added to the basic regression, but it is still positive. Only for GFR the coefficient is not different from zero. Therefore, it can be argued that these results support the hypothesis that increased financial integration leads to increase development of the domestic banking system.

The size (MCAP) and liquidity (TVT) of the stock market are in general positively correlated with the degree of integration, when measured by indicators of stock market integration, but not with more general indices, such as CLAS and GFR.

Another strong correlation found is that integration is associated with less volatile stock markets. One could suspect that this is the result that less volatile countries are also more developed, but this result is particularly important when other regressors are included, and initial per capita GDP did not appear to be significant. This result is robust to changing variables and moving from a sample of developed and developing countries (IAPM and ICAPM) to one with only developing countries (CLAS and GFR). This result contrasts with Levine and Zervos (1998), who find that although capital account liberalization deepens the stock market, it also increases its volatility.

Regarding results for other regressors, there are some interesting findings. First, regarding inflation it was found that it has a strong positive correlation with volatility and negative correlation with credit from the banking system to the private sector. Countries with high rates of inflation tend to have more volatility in their stock markets. This may be the consequence of large relative price changes that usually are associated with high inflation,[8] and the resulting change in relative profitability across firms and sectors, which should

[8]Existing empirical evidence shows that the variability of prices across goods and the variability of prices of a same good across stores increase with the rate of inflation. See Lach and Tsiddon (1992) and references therein.

be reflected in variability of stock prices.

At the same time, countries with high inflation tend to have a less developed (measured through CREDIT) banking system. Nevertheless, to a lower extent, it was found that market capitalization was higher in countries with high inflation. Perhaps the increased market capitalization with the reduction of credit intermediated through the banking system is precisely the result of moving to short term contracts and liquid assets, inducing a raise in the size of the stock markets. For TVT, the effects of inflation are not significantly different from zero.

Second, trade openness is positively associated to CREDIT, MCAP and TVT. This result suggests that may be international integration, financial and commercial, what promotes a deeper domestic financial market, rather than purely financial integration.

Finally, countries with higher initial per capita of GDP are countries with deeper financial systems (CREDIT, MCAP, and TVT), but there is no relationship to volatility. Therefore, the size of the economy is uncorrelated with volatility of the stock market.

5 Financial Integration and Economic Growth

In the previous section it was established that indeed there is a positive correlation between financial integration and the development of the domestic financial market. This section goes one step further examining the effect of international financial integration on economic growth. In particular, in this section I attempt to answer the following questions:

- Do countries with more financial integration have higher growth?
- Is there a different channel, to the usual effect of financial development, from financial integration to economic growth?

5.1 Interactions among financial deepening, integration and growth

As it has been discussed before, recent evidence tends to support the view that countries with more developed financial markets grow faster. The sample and variables used in this paper confirm that result.

To explore the relationship between financial integration, financial development and economic growth I present some cross-section evidence on the determinants of the rate of per-capita GDP growth during the period 1976–1993. Following the tradition, I regress the rate of growth of per-capita GDP on a set of regressors, which include indicators of financial deepening and indicators of international financial integration.

In table 4, rows "Base 1" and "Base 2" present basic regressions between financial deepening indicators (CREDIT, MCAP, VOL and TVT) and economic growth. In addition to the financial deepening variable, the base regressions include initial per-capita GDP, initial secondary school enrollment ratio and revolution and coups as indicators of political instability and degree to which property rights are protected. The difference between Base 1 and Base 2 is the sample. Base 1 uses the sample of 24 countries for which there are observations for ICAPM and IAPM, and as explained above, includes developing and industrialized countries. Base 2, in contrast, includes only countries for which there are observations for the variables CLAS and GFR, and therefore, includes only developing countries. The coefficient of the financial development indicators are shown in square brackets, while the others correspond to the coefficients on the financial integration proxy.

The table confirms previous findings of a positive relationship between financial deepness and economic growth. Indeed, CREDIT is positively associated with growth. Also, and consistent with the results of Levine and Zervos (1995), countries with a highly capitalized and active stock market grow faster. However, there seems to be no relationship between stock market volatility and economic growth, contrary to the negative relationship found by Levine and Zervos (1995). The reason for this difference is that the latter study considers a sample of 36 countries, while in this paper I use only 24 observations due

to the limitations imposed by the availability of indicators for international financial integration.

Table 4: **Interactions: Financial Integration, Financial Deepening and Economic Growth**

Dependent variable: GDP per capita growth								
	CREDIT		MCAP		VOL		TVT	
IAPM	-0.00061	[0.034**]	0.002	[0.022]	0.0036	[0.016]	0.003*	[0.048**]
	(-0.33)	[(4.45)]	(0.86)	[(1.45)]	(0.31)	[(1.33)]	(1.90)	[(5.42)]
ICAPM	-0.00053	[0.035**]	0.0018	[0.018]	0.0069*	[0.130]	0.0019*	[0.045**]
	(-0.42)	[(4.07)]	(0.95)	[(0.93)]	(1.89)	[(1.28)]	(1.90)	[(4.59)]
CLAS	-0.016	[0.062**]	-0.0076	[0.037**]	0.0036	[-0.002]	-0.008	[0.212**]
	(-1.40)	[(4.62)]	(-0.77)	[(3.37)]	(0.36)	[(-0.03)]	(-0.89)	[(3.91)]
GFR	-0.011**	[0.057**]	0.010**	[0.043**]	0.003	[-0.012]	0.009**	[0.200**]
	(-2.78)	[(4.66)]	(2.77)	[(3.19)]	(0.28)	[(-0.15)]	(2.48)	[(4.33)]
Base 1		[0.033**]		[0.027**]		[-0.028]		[0.048**]
		[(4.62)]		[(2.05)]		[(-0.75)]		[(3.78)]
Base 2		[0.048**]		[0.033**]		[-0.009]		[0.205**]
		[(3.49)]		[(3.01)]		[(-0.11)]		[(4.03)]

In each cell the first figure is the coefficient of the financial integration indicator. t statistics in parenthesis.
In square bracket coefficient of the financial deepening indicator.
Base 1: equation omitting financial integration indicator, sample based on IAPM and ICAPM.
Base 2: equation omitting financial integration indicator, sample based on CLAS and GFR.
* and ** significant at 10% and 5%, respectively.

It is interesting to note that the base regressions confirm the finding of De Gregorio and Guidotti (1995) that financial development has a stronger effect on growth in developing countries. As the table shows, the coefficient of the financial development indicator is greater in the regressions that constraint the sample to only developing countries. When industrialized countries are included (base 1), the coefficient is smaller. The novel finding is that this effect is not only valid for banking development (CREDIT) as discussed in De Gregorio and Guidotti (1995), but also for the development of the stock market.

In table 4, the coefficient of the financial deepening indicator are still positive, in most of the cases, when the financial integration indicators are included. This is particularly the case of CREDIT and TVT. The collinearity between MCAP and the indicators of integration of stock markets (IAPM and ICAPM) makes all of these variables to be not significant when they are included jointly.

Regarding the effects of financial integration on economic growth table 4 shows that financial integration has no additional effect on economic growth, beyond the effects that it may have on financial deepening of the domestic financial market. As reported in table 3, financial integration tends to make the domestic financial market deeper. However, beyond this effect, there is no additional effect of financial integration on economic growth. Only GFR appears to be significant, but changing signs across regressions, and hence, without clear implication.

5.2 The total effect of financial integration on growth

After establishing that in the sample and with the data of this paper there is no independent relationship between financial integration and economic growth, one may want to examine "net" effect of financial integration on economic growth. To this extent, I present results of regressing per-capita GDP growth on financial integration indicators, and other regressors, but excluding the effect of financial depth on economic growth. Thus the financial integration indicator would capture the effects of financial development on growth.

This analysis is presented in table 5. Three set of regressions were run for each indicator. The dependent variable is the rate annual rate of growth of per capita GDP for the period 1976–1993. The first column reports the coefficient of a regression where the only regressor is the financial integration indicator. Thus, this regression reports the partial correlation between financial integration and economic growth. The second column incorporates the financial integration indicator in a "base" regression, similar to the regressions of table 4, that includes initial per capita GDP, initial secondary school enrollment

ratio, and number of revolutions and coups. Finally, the last column includes in addition to the base regressors, indicators of judicial efficiency, inflation, government expenditure and black market premium.

Table 5: **Financial Integration and Economic Growth**

Dependent variable: GDP per capita growth			
	Single regressor	Base regressors	Other regressors
IAPM	0.0046*	0.0031	0.0026
	(1.80) [0.08]	(1.44) [0.39]	(0.89) [0.53]
ICAPM	0.0045**	0.0029**	0.0032
	(3.32) [0.12]	(2.57) [0.40]	(1.13) [0.53]
CLAS	0.0043	-0.003	-0.0065
	(0.57) [0.01]	(-0.31) [0.14]	(-0.76) [0.38]
GFR	0.0021	0.0081*	-0.0056
	(0.47) [0.01]	(1.66) [0.24]	(-0.95) [0.40]

t statistics in parenthesis. R^2 in square brackets
* and ** significant at 10% and 5%, respectively.
Base regressors: Initial GDP, initial secondary schooling, and number of revolutions and coups.
Other regressors: include in addition index of judicial efficiency, inflation, government expenditure and black market premium.

The results of table 5 show that in general there is no correlation between financial integration and economic growth. Only for ICAPM in the single and the base regression there is a strong positive relationship between integration of the stock market and economic growth. However, when additional regressors are included the positive relationship disappears. For the other indicators there is no a clear relationship between market integration and economic growth. Similar conclusions are found by Levine and Zervos (1995), who report a positive correlation between asset prices indicators of integration and growth, but, as they explain, these relationships are rather weak, since they are not robust to the inclusion of other relevant independent variables.

It could be expected that given the broad positive relationship between financial integration and financial depth, a regression that excludes financial

depth, which is positively correlated with growth, and includes financial integration should show up a positive correlation between financial integration and economic growth. However, the lack of precision of the estimates may be the result that the financial integration indicator is a poor proxy of the financial depth indicator.

An alternative way to analyze the indirect effect of financial integration on economic growth is to use the coefficients found for the positive relationship between financial integration and financial depth (table 3) with the coefficients of table 4 for the base regressions, which evaluates the impact of financial depth on growth in the sample countries.[9] This exercise is presented in table 6. The main effect on growth is through the deepening of the banking system. An increase in one standard deviation in IAPM, ICAPM and CLAS increase GDP growth by 0.5 to 0.7 percentage points. Note that the impact of increasing in one the value of CLAS (remember that this indicator takes values of 1, 2 and 3) would increase growth by 0.85 percentage points. The effects through deepening of the stock market are smaller in size, and restricted only to some indicators, in particular ICAPM.

Table 6: **Growth Effects of Financial Integration**
(percent)

Channel	IAPM	ICAPM	CLAS	GFR
CREDIT	0.54	0.51	0.66	—
	{0.37}	{0.27}	{0.85}	—
MCAP	0.20	0.37	—	—
	{0.14}	{0.20}	—	—
TVT	—	0.24	—	—
	—	{0.13}	—	—

The figures are effect changes of one standard deviation of the indicator of financial integration on growth.
In curly brackets are the effects of a unitary change of the indicator of financial integration.

[9] I use only the coefficients that are statistically significant. Since there are three coefficients per indicator I use the average coefficient.

5.3 The effects of foreign direct investment

An important form of international integration is the flow of direct investment across countries. Foreign investment flows have only secondary effects on overall financial development, and via that channel on economic growth. However, foreign direct investment (FDI) not only represents a form of capital inflows, but it also may have important effects on technology diffusion, by which developing countries are able to attract technologies available in more advanced economies.

The effects of FDI on economic growth have been analyzed by Borensztein, De Gregorio and Lee (1998).[10] They present a model in which the rate of technological progress is the main determinant of the long-term growth rate. Technological progress takes place through a process of "capital deepening" in the form of the introduction of new varieties of capital goods. Multinational corporations possess more advanced "knowledge," which allows them to introduce new capital at lower cost. However, the application of these more advanced technologies requires the presence of a sufficient level of human capital in the host economy. The stock of human capital in the host country, therefore, limits the absorptive capability of a developing country.

The effects of FDI on economic growth are tested in a sample of 69 developing countries over the last two decades. The results suggest that FDI is in fact an important vehicle for the transfer of technology, as it appears to contribute to growth in larger measure than domestic investment. Moreover, a fairly robust finding is that there is a strong complementarily between FDI and human capital, that is, the contribution of FDI to economic growth is enhanced by its interaction with the level of human capital in the host country. A representative regression is:

$$\begin{array}{rcccccc} \gamma_i & = & & -0.72 & \mathrm{FDI}_i & + & 1.61 \quad \mathrm{FDI}_i \times \mathrm{SCHA}_i \quad + \quad others \\ & & & (0.93) & & & (2.55) \end{array} \tag{8}$$

$R^2 = 0.25(0.19)$, N obs. $= 138$. where SCHA is male secondary school attain-

[10] See also De Gregorio (1992) and Blomstrom, Lipsey and Zejan (1992).

ment of the population.[11]

This regression shows that FDI affects growth directly, although in this specification is insignificant, and also through its interaction with schooling. The regression indicates that there is a minimum threshold from which FDI is growth enhancing. In the regression shown here, all countries with secondary school attainment is above 0.45[12] will benefit positively from FDI. In the sample, 48 out of the 69 countries satisfy this threshold.

6 Concluding Remarks

After reviewing the theoretical literature of financial development, financial integration and economic growth, this paper presents new evidence on the effects of financial integration. Although the results are many times weak, the evidence suggests that there is indeed a positive relationship between the degree of financial integration and the depth of the domestic financial system. There is, however, no evidence of direct effect of financial integration on economic growth, after controlling for the depth of the domestic capital market. Therefore, it can be concluded that the beneficial effects of financial integration on economic growth come mainly through fostering the development of the domestic financial system. In addition, on top of the growth effects, and consequently the welfare effects, portfolio diversification may allow a greater degree of consumption smoothing. There is still a puzzle of why international portfolio diversification is too small compared to the theoretical predictions. The paper also highlights the benefits of foreign direct investment and its interactions with human capital.

It is important to note that the findings and focus of this paper refer to long-run growth effects. I have ignored completely the transitional effects and how to achieve effective financial integration. Indeed, there is an important issue of what should come first, financial development or financial integration. As many country experiences show, opening the capital account in a weakly

[11] According to Barro and Lee (1994) this is the measure of school attainment most correlated with growth.

[12] Meaning a male population above 25 years with an average of 0.45 years of secondary schooling.

regulated financial system may exacerbate the problem of lack of regulation with the consequent effect on the ability of the financial system to perform adequately its role of credit allocation. In addition, as the recent experience with the surge of capital inflows illustrates, it may be necessary to graduate and smooth the integration of financial markets in order to preserve macroeconomic stability. All of these issues are outside the scope of this paper, but they are essential in designing a beneficial integration with the rest of the world.

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