CENTRO STUDI IN ECONOMIA E FINANZA

CENTRE FOR STUDIES IN ECONOMICS AND FINANCE

WORKING PAPER NO. 118

Financial Market Integration and Economic Growth in the EU

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April 2004

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Abstract

The diversity in the current degree of financial development across the EU can be a great opportunity at a time where this area is poised to become increasingly financially integrated. Integration should accelerate the development of the most backward financial markets, and allow companies from these countries to access more sophisticated credit and security markets. In line with a large recent literature, it is reasonable to expect that financial integration will have a "growth dividend" in Europe. This paper attempts to quantify this growth dividend, using both industry and firm-level data to estimate the empirical relationship between financial market development and growth, and to gauge how it will distribute itself across countries and sectors.

JEL Classification: D92

Keywords: Financial integration, financial development, growth

Paper presented at the 39th Panel Meeting of *Economic Policy* in Ireland. We thank Paul Seabright and two anonymous referees for comments. This paper draws on material contained in a study on "Financial market integration, corporate financing and economic growth" prepared for the European Commission, and coauthored also by Mariassunta Giannetti.

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1. Introduction

It is a commonplace remark that there is considerable diversity in the degree of development and sophistication of financial markets within the European Union. In 1980-95 the ratio between stock market capitalization and GDP ranged from the 8 percent in Greece and 12 percent in Italy to 41 percent in the Netherlands and 76 percent in the United Kingdom. Similarly, the GDP ratio of the claims of banks and other financial institutions ranged from 40 and 50 in Greece and Italy to over 100 percent in Sweden and the Netherlands. The degree of diversity is even greater when we include EU accession countries into the picture: on qualitative indicators of the access to the loan and stock market and of the quality of banking services, these countries score at or below the least financially developed current members of the EU.

This diversity of initial conditions should be considered as a great opportunity at a time where the EU is poised to become an increasingly financially integrated area. The reason is that financial integration is bound to accelerate the development of the most backward financial markets, and to allow companies and households from these countries to access the credit and security markets of the more advanced countries of the Union. The recent theoretical and empirical literature demonstrates that financial development is associated with higher economic growth, and economists and policy makers expect financial integration to have a "growth dividend" in Europe. The purpose of this paper is to provide an estimate of this growth dividend, based on the empirical relationship between financial market development and growth in the manufacturing industry.

The paper starts out in Section 2 with a discussion of the links between financial integration and financial development and the channels through which the financial integration of a group of countries at different stages of financial development may help the least developed to improve their access to finance. In Section 3 we present the methodology that we use to estimate the empirical relationship between measures of financial development and manufacturing output growth. We adopt the approach proposed by Rajan and Zingales (1998), which relies on the intuitive idea that access to finance is more relevant for firms that depend heavily on external finance. Although these authors applied it to industry-level data, we extend this approach also to firm-level data to obtain additional insights on the nature of the link between financial and real variables and the likely beneficiaries of financial market integration.

In Section 4 we estimate the relation between financial development and growth using an international industry-level panel. The data set combines industry-level information on sector growth, investment, number of firms, firm size and access to finance with country-level indicators of financial development and institutional variables. The sample covers a longer time interval and larger set of countries than that used by Rajan and Zingales. The regression results obtained using this panel support the hypothesis that financial development promotes growth, particularly in industries that are more financially dependent on external finance. Indicators of financial development are significantly correlated with the growth rate of manufacturing output and value added, and with firm creation. These estimates are an intermediate step to assess the effects of financial development and integration in the EU.

In Section 5 we use these estimates to simulate possible "scenarios" of the growth impact of full financial market integration in the EU, defined as a situation where availability of funds for any user located within the geographical boundaries of the EU is possibly constrained by the overall supply of funds within the EU, but not by the size of the local (national or regional) financial market. As a consequence, in a fully financially integrated EU the only measure of financial development that matters is the one of the most developed area. To illustrate, we simulate the impact of financial integration on manufacturing sector growth by raising the level of financial development in each EU country to the US level of financial development. We consider the latter to be a valid benchmark, being a highly developed and continent-wide financial market, not dissimilar from what an integrated European financial market would presumably look like once the integration process is completed. Indicators of financial development place the US slightly above the most financially developed European countries, and its size is comparable to that of the EU.

Full financial integration is a rather extreme scenario and is unlikely to be achieved merely through policy reform. Financial and regulatory reform, however, can do a lot to eliminate barriers to integration and to promote financial development. The latter is correlated with several underlying regulatory variables (such as indicators of investor protection, rule of law, etc), which are under the control of national legislators and EU directives. For policy purposes, analyzing changes in these regulatory variables may be a more interesting exercise than analyzing integration of the financial systems themselves. Since assuming that EU will raise its regulatory and legal standards to the U.S. standards appears unrealistic, in this case

we examine a scenario where EU countries raise their standards to the highest current EU standard.

We estimate that the effect of achieving full financial integration on the growth of European manufacturing industry is in the ballpark of 0.7 percentage points per year. But this overall growth effect results from markedly different country and sector effects, reflecting the heterogeneity of the EU in terms of sector composition and level of financial development. Convergence of regulatory and legal standards would have an average growth effect about 20 percent lower.

In Section 6 we apply the methodology described in Section 3 to a panel of companies incorporated in the EU, and in Central and Eastern European countries. This allows us not only to check the robustness of the results obtained with industry-level data, but also to investigate whether the benefits of financial integration will differ across firms of different size, as theory predicts. In fact, smaller businesses are potentially the main beneficiary of integration in so far as the latter means for them access to a larger and more developed financial market than that within their national borders. Furthermore, the availability of information for accession countries in this dataset allows us to assess the impact of financial integration on economic growth in Central and Eastern Europe. Firm-level estimates turn out to be quite consistent with the industry-level estimates reported in Section 4. This is an impressive result, considering that the two data sets differ deeply in terms of aggregation level, country coverage and time interval. The micro estimates also highlight that the growth of small enterprises is more sensitive to financial development than that of large firms.

Section 7 discusses implications of our results for the process of European financial market integration. We comment on the likely losers and gainers from this process, and on the consequent emergence of interest groups in favor and against the integration process. We argue that political economy issues are particularly important since financial integration is only partly the consequence of spontaneous market and technological development; it is mostly the result of policy action and regulatory reform. Section 8 concludes with a summary of the results and some notes of caution about their interpretation.

2. The effect of financial integration on financial development

How should financial integration be expected to affect financial development? Addressing this question is a preliminary step for assessing the likely effects on economic growth of financial integration in Europe. We argue that financial integration should increase the supply of finance in the less financially developed countries of the integrating area. This may occur either because it brings more efficient intermediaries closer to the firms in backward areas (by facilitating their entry) or because it enables these same firms to access more distant financial markets. In either case, firms in less financially developed countries will face easier and cheaper access to external finance in either the local market or in the broader, integrated one, and this should spur capital accumulation and economic growth. The following two sections discuss in greater detail these channels, the implications of each of them for the size of local financial markets as usually measured (e.g. the volume of intermediated funds scaled by GDP) as well as some qualifications and their implications for our empirical analysis.

2.1. Effect of integration on national financial markets

Financial integration is likely to spur the efficiency of the financial intermediaries and markets of less financially developed countries. To the extent that greater efficiency stimulates the demand for funds and for financial services, this should also translate into an increased size of domestic financial markets.

The main channel through which this effect should operate is the increased competition with more sophisticated and cheaper foreign intermediaries, associated with financial integration. Competitive pressure from these intermediaries should reduce the cost of financial services to the firms and households of countries with less developed financial systems, and thus expand the quantity of the local financial markets.

In some cases, the additional supply of financial services may be provided by foreign intermediaries entering the local market by acquiring local banks or merging with them. Direct penetration by foreign banks and cross-border acquisitions of intermediaries are likely to erode the local banks' rents. If the mergers fostered by this process bring banks closer to their efficient scale, the process should also be associated with reductions in the cost of

intermediation. The increase in competition, possibly coupled with cost cutting, should translate into better credit conditions, and hence stimulate investment and economic growth.

A second reason why financial integration may be associated with local financial development is that the process of integration generally requires improvements in national regulation (accounting standards, securities law, bank supervision, corporate governance) to bring it in line with best-practice regulation in the integrating area. The tendency towards a "level playing field" in regulation is an essential pre-requisite of an integrated market, and it is reasonable to expect this convergence in regulatory standards to result in an improvement in the regulatory standards of less developed financial markets. This improvement may help promote their development, by reducing adverse selection and agency costs as well as the distortions induced by inadequate regulation.

On both accounts, therefore, one would expect financial integration to bring about an improvement in the supply of finance in the less financially developed markets and an increase in the size of local financial markets as measured by size-based measures of financial development, such as domestic stock market capitalization and bank lending relative to GDP. Although this prediction guides our simulation exercise concerning the effects of financial integration, it requires some qualifications, to which we turn now.

2.2. Effect of integration on the access to foreign financial markets

It is quite possible that, as financial integration proceeds, the most financially developed countries will share the services provided by their financial system with the other integrating countries. The economies of scale and the external economies involved in financial intermediation can be a powerful fuel for the expansion of the established intermediaries and markets of the more developed markets.

The banks of more developed countries can provide cross-border loans to the firms of less advanced countries. In this case, the additional provision of credit will not show up in the private domestic credit of the latter countries. Similarly, the financial services provided by foreign intermediaries will not show up in the domestic supply of such services in the countries with less developed financial markets. Thus, just looking at size-based measures of local financial development may not reveal the true improvement in the accessibility of credit and financial services in such countries following financial integration.

A similar argument applies to equity markets. As these become more integrated, firms of less financially developed countries can access more easily major financial centers by listing their shares on foreign stock exchanges. They may want to do so for a variety of reasons: overcoming equity rationing in the domestic market, reducing their cost of capital by accessing a more liquid market, signaling their quality by accepting the scrutiny of more informed investors or the rules of a better corporate governance system (Pagano, Röell, Randl and Zechner, 2001; Pagano, Röell and Zechner, 2002). Whatever the reasons, by listing their shares abroad, the firms of less financially developed countries add to the stock market capitalization and turnover of those markets, rather than those of their domestic exchanges, as documented by Claessens, Klingebiel and Schmukler (2002). Therefore, the increase in domestic stock market capitalization may not fully reveal the impact of financial integration on access to equity markets by firms located in less financially developed countries.

In fact, while integration may expand the financial sector primarily in the already financially developed countries of the area, it may even decrease the availability of funding to their non-financial firms, which will now compete with foreign firms for such funds. However, this crowding-out effect is likely to be outweighed by the increased efficiency of financial centers associated with their expanded activity. If so, financial integration would increase the availability of funds and financial service efficiency in all integrating countries.

The upshot of this discussion is that as financial integration proceeds, the size of the financial market of a given country as a measure of its degree of financial development loses significance. Distance and thus geographical segmentation tends to become less important in financially integrated markets. Indeed, in a fully integrated market, what matters is the total size of the financial market of the integrating area: firms of a given country may have equal access to financial services as those of all other countries even if their domestic financial sector (scaled by GDP) differs from that in other countries. In other words, differences in the size of local financial markets cannot be exploited to identify the link between financial development and economic growth if countries are perfectly financially integrated. Identification can only come from observations pertaining to a time of nationally segmented markets. Our estimates and simulations will be based on these intuitions.

For this reason, we should not expect that in a fully integrated European capital market all countries will have the same credit-GDP ratio and the same stock market capitalization-GDP ratio. Actually, given the scale and external economies in the financial service industry,

this outcome is unlikely: the financial industry may tend to concentrate in a limited number of countries or even cities, as illustrated by U.S. financial history. But we expect the supply of finance for the integrating area as a whole to expand significantly. And thus, in an integrated market all firms, regardless of country, will still have access to the same funding opportunities, some of which possibly offered by foreign intermediaries. But their situation will be *equivalent* to one where they could access an equally broad and developed domestic financial market.

3. Estimating the relationship between financial development and growth

The current consensus view among economists is that financial development spurs investment and growth, although opinions differ considerably about the quantitative importance of this relationship.[1] Indeed, a large and growing literature has documented a robust correlation between finance and growth: countries with more developed financial markets grow faster. To go beyond this mere correlation, first noticed by Goldsmith (1969), one needs to establish if there is a causal relationship running from financial development to growth. Therefore, any empirical analysis must address carefully the potential reverse causation from growth to financial development. Nowadays, the weight of the evidence is convincingly in favor of the view that financial development is capable of spurring economic growth.

Previous studies relied on three types of data: country-level, industry-level or firm-level data. In all three cases, to go beyond the mere correlation observed by Goldsmith, researchers have used econometric techniques and identification strategies that allow to control for the possible feedback effects of economic growth on financial development, that is, for the fact that higher growth tends to call forth an increased supply of financial services.

The studies that use country-level data try to overcome the reverse causation problem by relating indicators of financial development at the beginning of the sample period to subsequent growth in a cross-section of countries: see for instance King and Levine (1993a,

[1] An important issue is whether financial development has mainly "level effects" – that is, allows countries to raise long run per capita output – or rather it affects steady state growth. In principle both outcomes are possible, depending on the nature of the growth process. In endogenous growth models, financial development and financial reform would allow countries to grow permanently faster. In more traditional models with exogenously-driven technological progress, financial development – by allowing more investment and capital accumulation – would grant a transitory (but possibly prolonged) increase in the economy's growth rate, and a permanent increase in per-capita GDP.

1993b) and Levine and Zervos (1998). The use of predetermined variables to measure financial development only partly overcomes endogeneity problems.[2]

The main difficulty in overcoming the reverse causality problem when using aggregate data is to find instruments that can be considered truly exogenous, i.e. variables that affect financial development but are uncorrelated with economic performance. For instance, King and Levine (1993b) show that their estimates are robust to the use of the level of secondary school enrollment as an instrument for financial development. Beck, Levine and Loayza (2000a, 2000b) use the legal origin of the financial system, a measure of accounting standards and of contract enforcement as instruments for financial development, and again find that the size of the financial sector has a positive and robust correlation both with per-capita GDP growth and with total factor productivity growth.

A more recent strand of empirical studies relies on industry-level and firm-level data to make further progress on the issue of causality and shed light on the channels through which financial development affects economic growth. This approach was proposed and implemented on industry-level data for a large sample of countries in the 1980s by Rajan and Zingales (1998). They construct their test by first identifying each industry's need for external finance from firm-level data for the U.S., under the assumption that financial development is highest in that country. Then they interact this industry-level "external dependence" variable with a country-level proxy for the degree of financial development (so as to obtain a variable that measures the extent to which financial development constrains the growth of each industry in each country) and use this variable in a regression for industry-level growth. This approach, illustrated in Box 1, is designed for industry-level data, but can also be applied to firm-level data and constitutes the basis of our empirical tests.

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[2] An omitted common variable, such as household thriftiness, could still drive both long-run growth and the initial level of financial development, generating a spurious correlation between them. Moreover, temporal precedence does not necessarily imply causality. For instance, stock market valuations may reflect changes in future growth opportunities and banks may lend more in anticipation of high growth in the sales of their customers. If so, financial development may only be a leading indicator of future growth.

BOX 1: The Rajan-Zingales methodology

Consider an international database of industry-level (or firm-level) data, and denote the growth rate of value added (or output and number of firms) by $y_{i,c}$ where i identifies the industry (or the firm) and c the country. This variable is regressed on a set of variables $X_{i,c}$ that vary *both* across industries and countries, on an indicator of financial dependence D_i multiplied by an indicator of financial development F_c (for instance, stock market capitalization or bank credit scaled by GDP), on industry-level fixed effects a_i (i=1,…,N) and country-level fixed effects δ_c (c=1,…,C):

$$y_{i,c} = \beta X_{i,c} + \gamma D_i F_c + \alpha_i + \delta_c \quad (1)$$

The financial dependence measure D_i measures each industry's need for external finance from US firm-level data.

The assumption is that for US listed firms access to financial markets is not an obstacle to investment, e.g., that US firms face a perfectly elastic supply curve for funds. Thus, differences across US firms in reliance to external finance reflect primarily differences in demand triggered by differences in technology. Therefore, the methodology rests on the assumption that technology, and therefore capital requirements, varies across industries but not across countries. For instance, the capital-intensity of steel production is assumed to be the same in the US and India. While this may sound as a very strong assumption, it is the standard hypothesis that is made in growth models.

This method also filters out the potential feedback from future growth onto financial development. If the relation between financial development and growth is positive only because financial markets anticipate future growth, sectors that differ in "external dependence" should be affected in the same way, and therefore the coefficient γ of the interaction variable should not be statistically different from zero. Furthermore, since the regression includes a full set of country fixed effects that capture any growth-relevant variable, such as international differences in the quality of institutions or in citizens' preferences, the model is not based on the unrealistic assumption that financial development is the unique source of heterogeneity across countries.

Rajan and Zingales find that various measures of financial development (such as total stock market capitalization, domestic credit to the private sector, and accounting standards) disproportionately affect economic growth in industries that are more dependent on external finance, even after controlling for country and industry fixed effects.

One potential problem with this methodology is that financial development may affect both the growth ability of an industry as well as the country pattern of industry specialization, leading less financially developed countries to specialize in industries that require less external finance. This correlation between financial development and industry structure, if not accounted for, may bias the estimates of the effect of financial development on growth if the

growth rate of the industries in which a country specializes differs from the average. To account for this we include in the regression the beginning-of-period industry share in value added. This way, the effect of financial development on industry growth is netted of any effect it may have on growth through the pattern of specialization.

Since industry (or firm) performance and measures of financial market development may be driven by common factors (e.g., consumer demand), in estimating equation (1) one faces a potential endogeneity problem. As we shall see, this problem can be handled by instrumental variables (IV) estimation, using measures of creditor rights, legal origin of the country and the quality of law enforcement as instruments. These instruments have been used before in cross-sectional studies to capture the exogenous component of financial development. In fact, an extensive literature on law and finance argues that the type of legal system determines institution performance and, in particular, the size and efficiency of financial markets.

Equation (1) is particularly well suited to study the effects of financial integration over time and across countries. First, it allows *testing* for the presence of financial integration over a specific time interval. If all countries examined were fully integrated, then national (or local) financial development should not matter for the growth of national firms, whatever their dependence on external finance. In a fully integrated area, firms that are financially constrained at home would simply borrow abroad (where funds are more easily available), implying that the estimated parameter $\hat{\gamma}$ would not be statistically different from zero.[3] Similarly, if one finds that after a period of financial market integration $\hat{\gamma}$ declines, the extent of the decline can be interpreted as reflecting financial integration. We exploit this feature to test whether the process of financial integration in the 1990s has weakened the effects of domestic financial development on domestic growth.[4]

Second, the approach can be used to assess the *differential* impact of financial integration, because it allows us to identify the countries and industries that are more likely to

[3] Alternatively, financial integration can lead to financial convergence, with countries with the less developed financial institutions converging to the level of the most financially developed countries because more efficient, foreign intermediaries enter the local market. The level of financial development of all countries collapses to a single value – that of the most developed country – and the growth-financial-development relation disappears.

[4] Needless to say, the reverse is not true. A finding that γ is not statistically different from zero does not imply that there is full financial integration, but only that finance does not matter for growth. It is therefore important to estimate equation (1) in periods in which international financial markets are segmented. We run our basic regressions on data prior to 1991, i.e. before the EU lifted capital controls and started the process of full financial integration.

benefit from financial integration. We can therefore rank countries in terms of relative gains in economic growth from financial integration. Since we assume that financial integration spurs financial development particularly in the most backward markets, its benefits will be concentrated in these markets. Moreover, it will affect disproportionately the sectors where a larger fraction of firms depend on external finance.

In particular, the product of the estimated coefficient $\hat{\gamma}$ and the interaction between financial dependence and access to finance, i.e. the variable $\hat{\gamma} D_i F_c$, provides an indication of the potential impact of changes in the degree of financial development of the various countries of the EU. This impact depends on their industrial composition, on the assumed degree of financial integration and on the assumed "target" of the integration process. Clearly, the countries bound to gain more from financial integration and development are those with backward financial markets that specialize in industries that rely heavily on external finance. At the other side of the spectrum, countries that are likely to gain little from financial market integration are those that have already developed financial markets and that specialize in sectors that do not require extensive use of external finance.[5]

4. Industry-level results

In this section we apply the approach illustrated in Box 1 to industry-level international data, relying on four main data sets. The first is the UNIDO data base which contains data by three-digit-industries on output, value added, number of firms and firm size for 169 countries at annual frequency over the period 1967-1999, though complete data are only available for the 1981-1995 period. Since indicators of financial development or other institutional variables are not available in many countries, we use only 61 of the 169 countries present in the

[5] This methodology cannot, however, be used to test if the growth effects of financial development are permanent or transitory (i.e. whether they affect only transitional dynamics or steady state growth), since the data do not vary over time. Our approach exploits only the cross-sectional variation in the growth rates (the dependent variable) and in the degree of financial development and of financial dependence (two of the dependent variables). To assess the degree of persistence of the estimated effects, one would need to exploit also the time-series variation of growth and financial development, using panel data techniques. But this gain would come at the cost of severe endogeneity problems in the measures of financial development. Sorting out the transitory effects of financial development on growth from its permanent effects would require several decades of data on economic performance with significant episodes of financial development: this would allow comparing economies across different steady states and avoid confounding slow transitional dynamics with permanent effects. Such data have not yet been assembled. However, the finding that differences in financial development across countries at a point in time affect their average growth rate over many years leads at least to the conclusion that financial development has persistent effects.

database. Overall, the resulting sample is a panel dataset of 36 industries in 61 countries, resulting in a total of 2,196 observations per year. However, observations on some industries are lost due to missing data on output, value added, or other variables used in the regressions, reducing somewhat the final size of the sample used in estimation.

The second dataset contains the indicators of financial dependence computed by Rajan and Zingales (1998), which we merge with the industry-output data to classify industries according to their sensitivity to financial development. The third dataset contains measures of the degree of financial development across countries. We rely on three main indicators that have been used in the literature on finance and growth: the GDP ratio of stock market capitalization, the GDP ratio of the value of claims of banks and other financial institutions, and an indicator of accounting standards. These measures are obtained from Demirgüç-Kunt and Levine (2001).

Our final dataset contains a number of country-level institutional determinants of the degree of financial development that are typically controllable by policy makers. We have assembled six such variables: a measure of creditor rights, two indicators of the quality of private and public enforcement, the duration of the judicial process, a measure of the cost efficiency of the judiciary, and an indicator of the rule of law. Data definitions and sources are reported in the Appendix, and descriptive statistics are available in Tables A1, A2 and A3.

Table 1 reports regressions for the growth of value added. The United States is excluded from the sample because it is the reference country whose capital markets are assumed to be frictionless. We use the maximum number of countries with valid data on value added growth and indicators of financial development. The data collected by Demirgüç-Kunt and Levine (2001) allow us to consider 20 additional countries with respect to the Rajan-Zingales sample of 41 countries.[6] Except for Luxembourg, which we drop because the development of its financial sector is statistically anomalous, we have all EU countries in our sample.[7]

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[6] Compared to the study by Rajan and Zingales, our sample also includes the following countries: Barbados, Bolivia, Cote d'Ivoire, Cyprus, Ecuador, Fiji, Honduras, Iceland, Indonesia, Iran, Ireland, Jamaica, Kuwait, Mauritius, Nigeria, Panama, Swaziland, Trinidad and Tobago, Tunisia and Uruguay.

[7] With respect to Rajan and Zingales, we adopt a slightly more restrictive choice for including sectors in the industry panel, since we retain observations only if output or value added are reported for *each* year between 1981 and 1991, while Rajan and Zingales retain also observations for sectors with no less than 5 years of data. This results in a slightly lower number of observations than Rajan and Zingales (around 1,100 against around 1,200). Sensitivity analysis performed on the Rajan and Zingales sample shows that this choice makes very little difference.

The estimation includes fixed industry effects and fixed country effects, which control for *all* time-invariant country and industry variables that are potentially important for growth. This is a considerable advantage in specification choice, since it would be very difficult to account explicitly for all such variables in the regression. Inevitably, some variables would be omitted due to erroneous specification or lack of information.[8] All regressions include the industry's share of total value added at the beginning of the sample period (1981), and in all regressions the standard errors of the coefficient estimates are robust to unknown forms of heteroskedasticity.

The regression in the first column uses stock market capitalization as proxy for financial development. The estimated coefficients refer to a regression of the growth of value added on the relevant industry's initial share of value added and the interaction between external dependence and market capitalization (the D_iF_c variable in equation 1). The coefficient of the interaction term is positive and statistically different from zero at the 1 percent level, indicating that financial development affects growth, particularly in those sectors that rely more intensively on external finance.

The second regression replaces market capitalization with domestic private credit. The results are similar: the coefficient of the interaction term is again positive and precisely estimated. The regression reported in the third column uses our preferred indicator of financial development, namely the sum of stock market capitalization and private credit, which we call "total finance". In the fourth regression, external dependence is interacted with accounting standards. In each of these regressions the impact of financial development on value added growth is positive and statistically different from zero at the 1-percent level.

The specification reported in the last column includes also an interaction term designed to test if the effect of financial development is larger for non-OECD countries. This hypothesis reflects the concern that OECD countries may already be much more closely integrated in a single capital market than developing countries, and that therefore the effect of financial development estimated in the previous regressions may apply only to the latter (in a financially integrated area the coefficient on the interaction term including the financial

[8] When interpreting and simulating the effects of financial integration on economic growth it is important to remember that the presence of country fixed effects might attenuate the coefficient estimate of financial development on growth. Suppose that financial development affects growth also through different channels than relaxing financial dependence, for instance because countries with larger financial markets are also able to allocate funds more cheaply, regardless of the financial dependence of each particular industry. Country fixed effects will pick up these and other country-specific effects that do not operate by relaxing financial dependence.

dependence indicator should be zero). However, this concern appears to be unwarranted. The coefficient of the interaction term is almost identical as that in the third column (0.026 instead of 0.023), while it should be zero in a financially integrated area. Correspondingly, the coefficient of the same variable interacted with the non-OECD dummy is very small (-0.008) and not statistically different from zero.[9]

We also experimented with other specifications – not reported for brevity – to test if other subsets of countries are more closely financially integrated than the rest of the world. The coefficient of the interaction term between D_iF_c and a dummy for the EU is not statistically different from zero, indicating that the EU is not more financially integrated than the rest of the world, at least over the period covered by our sample. We also estimated a specification that includes a variable that interacts D_iF_c with a measure of trade openness (also drawn from Demirgüç-Kunt and Levine, 2001), on the grounds that close trade partners may also be more closely integrated financially. Also the coefficient on this further interaction variable is not significantly different from zero, paralleling the results parallel in Edison, Levine, Ricci and Slok (2002). As in their estimates, proxies for international financial integration appear not to affect growth, once one controls for domestic financial development. One can interpret this as indicating that so far financial integration enhanced growth only insofar as it improved domestic capital markets. Alternatively, it may indicate that the financial market integration that has thus far taken place is still insufficient to show up significantly in the data.

In Table 2 we report regressions for output growth. As in Table 1, the specifications include interactions of external dependence with market capitalization, private credit, the sum of the two, and accounting standards. The results confirm that financial development promotes industry growth, since the coefficient of the interaction term is always positive and statistically different from zero. The last column tests if the degree of financial integration is the same inside or outside the OECD. Again, the hypothesis is not rejected.

Tables 3 and 4 perform useful sensitivity tests with respect to the potential endogeneity of financial development, the choice of instruments, the list of regressors and the sample period. Each of the three indicators of financial development is potentially endogenous: economic growth may be driving stock market capitalization, bank credit and the sum of the

[9] Manning (2003) finds that Rajan and Zingales results are sensitive to the inclusion of the 'Tiger" economies. To address this criticism, we estimate our regressions dropping these countries from the sample. The results are

two, rather then the reverse. Furthermore, there might be other determinants of manufacturing industry growth that are correlated with our indicator of financial development. It is therefore important to check the sensitivity of our results to the potential endogeneity of financial development and to the inclusion of additional regressors. The first column reports the IV estimates using as instruments institutional variables that affect financial development but are predetermined with respect to economic growth over the time span covered by our data: legal origin of the country, rule of law, and creditor rights. The coefficient of the interaction term increases in value (from 0.023 to 0.033) and retains its statistical significance, indicating that the endogeneity of financial development is not an issue in our data. Furthermore, as shown by the test of over-identifying restrictions and the rank test, we cannot reject the null hypothesis that our instruments are valid. This is also true in all other regressions shown in the two tables.

The second regression adds to the set of right-hand-side variables the interaction of schooling and initial per capita GDP with external financial dependence. The empirical growth literature shows that schooling and initial GDP per capita affect growth rates. Furthermore, they may influence the effect of financial development on growth: an increased availability of external finance may have a larger growth impact in countries with higher human capital endowment and higher level of economic development (approximated by GDP per capita). Also this regression is estimated with instrumental variables, using the same set of instruments as in the first column. The results are qualitatively unchanged: the coefficients of the additional interaction terms are not significantly different from zero.

In the third column we expand the set of instrument to include two indicators of enforcement (the indicators of public and private enforcement provided by La Porta et al, 2003) and two indicators of judicial efficiency: the number of days to collect a bounced check (as measured by Djankov et al, 2003) and the cost of justice as a percent of GDP (drawn from the World Bank Doing Business Database). The coefficient on the interaction term between external dependence and financial development is of the same order of magnitude and statistically significant at the one percent level.

In the present framework, a positive effect of financial development on industry and country growth implies less than full financial market integration. If the world were fully integrated (even if financially under-developed), domestic financial development would have

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qualitatively similar to those reported in Tables 1 and 2.

no effect on local growth. Therefore our results suggest that, as of 1991, geographical segmentation was still effective, and financial markets were poorly integrated. Did financial integration progress over the 1990s? Asking this question is important, because the 1990s witnessed a considerable increase in international capital mobility, removals of barriers and exchange controls, and harmonization of financial regulation. If increased integration already weakened the link between domestic financial development and national growth, the benefits from additional integration would be overstated by 1991 data.

To check the sensitivity of our findings to the particular sample used, in the fourth column of Table 3 we report estimates obtained extending our sample up to 1995, the most recent year with sufficient observations provided by the UNIDO data set. The estimated coefficient of the interaction term between financial development and external dependence indicates that the effect of financial development on value added is similar to the previous set of estimates. This suggests that whatever integration took place in the first half of the 1990s was partial or has not yet produced its effects on growth.[10]

Table 4 reports the same sensitivity tests for output growth. In these regressions the coefficient of the interaction term of external dependence and financial development is positive and statistically different from zero at the 1-percent level, even using instrumental variables, including schooling and per capita GDP among the regressors or extending the sample period to 1995.

Overall, these results indicate that financial development affects growth, even taking into account the potential endogeneity of financial development and the potential impact of human capital and per capita GDP.

[10] There is some evidence that European countries have become more financially integrated. For instance, Blanchard and Giavazzi (2002) find that national investment is less constrained by national saving in Europe. According to Feldstein and Horioka (1980) this signals increased financial integration. The pattern of this correlation should be interpreted with care, however, because it might be affected by the endogeneity of the saving rate with respect to the investment rate. On the other hand, analysis based on the correlations of consumption growth rates across European countries highlights that consumption in all countries reacts to idiosyncratic income shocks, suggesting that financial markets in the European Union still allow only incomplete risk sharing, see for instance Adam, Jappelli, Menichini, Padula and Pagano (2002).

5. Assessing the impact of financial integration on economic growth

The estimates discussed in Section 4 can be used to evaluate the effect of financial integration on economic performance and how benefits from integration will be distributed among the integrating countries. To assess the impact of financial integration on the growth rate of value added and output, we construct two different scenarios.

In the first scenario, we assume that financial integration in the EU will be associated with the same level of financial development of the United States. We consider the US as a valid benchmark, being a highly developed and continent-wide financial market, probably not dissimilar from what an integrated European financial market might look like. In the US the most comprehensive indicator of financial market size, i.e. the sum of stock market capitalization and total private credit scaled by GDP, is 2.09, higher than that of any EU country, though not far from the corresponding values for the most financially developed EU countries (the score for Sweden, the U.K. and the Netherlands being 1.47, 1.50 and 1.69 respectively). In fact, the approach by Rajan and Zingales (1998) takes the U.S. as the benchmark of a frictionless capital market. Also the size of the US economy is comparable to that of the EU taken as an integrated market. At the beginning of 2001, the US population was 278 million, as opposed to 377 million in the 15 EU countries; in 2000, the US GDP was € 10,709 billion against a total EU-15 GDP of € 8,524 billion at current prices.

It should be stressed that the results of this scenario are similar to those obtained from a slightly less optimistic scenario where the level of financial development of all EU countries is raised to the level of financial development of the UK or the Netherlands. In particular, the ranking of the simulated impacts by countries and sectors would not be affected by considering raising financial development to the British or Dutch standards.

Even more importantly, it must be noted that assuming that all EU countries reach the same level of financial development as the US does not correspond to a hypothetical (and unrealistic) situation where each EU country achieves the same stock market capitalization/GDP ratio or the same private credit/GDP ratio as the US. Rather, it is intended to capture a situation where any EU company, wherever it is located, would have the same access to stock market financing and to bank credit as its US counterparts. This may well happen not as a result of its domestic capital market development, but rather as a result of

their improved *access* to other EU financial markets, that is, by raising equity or credit in other EU countries, as we explain above.

BOX 2 : Simulation methodology

To illustrate the simulation methodology for the first scenario, suppose one wants to simulate the impact of raising financial development in country *c* to the US value, as measured by, say, the ratio of stock market capitalization to GDP. For this purpose, we multiply the estimated coefficient $\hat{\gamma}$ by the difference between the degree of stock market development in the US, denoted by F_{us}, and that in country *c*, denoted by F_c (obviously $F_c < F_{us}$), taking into account industry dependence on external finance. That is, we estimate the impact of raising financial development to the US level for sector *i* in country *c* as follows:

$$\hat{\gamma} \cdot D_i \cdot (F_{us} - F_c) \tag{2}$$

Clearly, for any given sector *i*, the countries whose growth benefits most from integration are those with the largest financial development gap, $F_{us} - F_c$. Similarly, for any given country gap, the sectors whose growth gains most from integration are those with the highest dependence on external finance. The impact on a country's growth rate will therefore depend both on its financial development gap and on its industrial specialization.

Finally, to summarize the benefits of financial integration we compute weighted averages of the expression above for any country or sector, where the weights are the value added shares in the relevant sector or country. More precisely, denoting by x_{ic} the value added of sector *i* in country *c*, we compute the:

$$\text{impact on the growth of country } c = \sum_i \left[\frac{x_{i,c}}{\sum_i x_{i,c}} \cdot \hat{\gamma} \cdot D_i \cdot (F_{us} - F_c) \right], \tag{3}$$

$$\text{impact on the growth of sector } i = \sum_c \left[\frac{x_{i,c}}{\sum_c x_{i,c}} \cdot \hat{\gamma} \cdot D_i \cdot (F_{us} - F_c) \right], \tag{4}$$

$$\text{impact on EU growth} = \sum_c \left\{ \frac{\sum_i x_{i,c}}{\sum_i \sum_c x_{i,c}} \sum_i \left[\frac{x_{i,c}}{\sum_i x_{i,c}} \cdot \hat{\gamma} \cdot D_i \cdot (F_{us} - F_c) \right] \right\}, \tag{5}$$

where expression (5) is the estimated effect on the growth rate of all sectors and EU countries.

The exercise provides an estimate of the potential impact of raising financial development to the US level (or, for that matter, to any other standard) for any country and sector. Notice that expressions (3), (4) and (5) estimate the increase in growth in country *c*, in sector *i* or in the EU that could be achieved from raising financial development to the US level. Alternatively, it can be considered as the growth in country *c*, in sector *i* or in the EU that is currently forgone as a result of financial market imperfections. As explained in Section 2, the cross-sectional nature of our estimation approach does not allow us to predict whether this increase in growth is permanent or transitory.

It is worth pointing out that our simulations do not account for any growth effect of financial integration through its impact on industry specialization. Svaleryd and Vlachos

(2002) argue that financial development in a given country may twist industry specialization towards sectors with higher growth potential. In our expressions the value added shares in the relevant industries may therefore change with financial integration. Accounting for this extra link would further increase the benefits from financial integration.

In the second scenario we recognize that financial development is the result of both spontaneous market developments and variables that change as a consequence of economic reform and policy action. Thus, the second scenario posits that policies by national and EU legislators will bring the institutional determinants of financial development to the highest EU standard. Then we predict their impact on financial development from a first-stage cross-country regression of financial development on its institutional determinants. Finally, we use the predicted value of financial development to evaluate the effect of financial integration on the growth of EU countries.[11] Box 2 illustrates the simulation methodology.

5.1. Raising financial development in the EU

We estimate the impact of financial integration on country and industry growth of both value added and output raising our indicator of financial development to the US standard. The computation of the growth effect of financial integration is obtained using the coefficient estimates of the instrumental variable regressions in column (2) of Table 3. Averaging over all countries and sectors, the estimated impact of financial integration on the growth of value added in the EU as a whole (expression 5) amounts to 0.72 percentage points per year. The corresponding figure for manufacturing output growth is 0.89 percentage points.

This overall impact, however, underlies considerable diversity in country and sector growth, reflecting both the degree of financial backwardness (more backward countries gain more) as well as the sector specialization (countries that specialize in financially dependent sectors gain more).

Figure 1 reports the increase in the growth rate of value added by country. The effects are similar if growth is measured by value added or output. The figure shows considerable country dispersion in the growth effect of financial integration. In a first group of countries, growth increases substantially by 1 percent per year or more: Belgium, Denmark, Germany,

[11] Our methodology accounts for the direct effects on industry and country growth of financial integration but not for indirect effects such as those arising from trade links across industries and countries. For this purpose, one would need a structural multi-country model. This is beyond the scope of this paper, which follows a reduced form approach.

Greece, Ireland, Italy, Portugal and Spain. In other countries, growth increases by less than 1 percent per year: Austria, Finland, France, and in particular the Netherlands, Sweden and the UK. It is interesting to note that even the first group includes some countries from Northern Europe. And even in the second group there are several countries whose growth increases considerably (Austria, Finland and France). Predictably, the only ones who do not gain much are the most financially developed countries, that is, the Netherlands, Sweden and the U.K.[12]

Figure 2 plots the growth effect of the 9 industries that are expected to contribute more to European total growth (to make the graph more readable we focus on 9 industries only). There is again some similarity between the impact of financial integration on output and value added growth at the sector level. As with country growth, the total effect reflects (i) the degree of financial dependence of the industry and (ii) the weight of highly financially dependent industries in the industrial structure of financially backward countries. The dispersion by industry is larger than the dispersion by country. In all the sectors reported in Figure 2 growth increases by over 1 percentage point. And in some industries – notably Drugs, Plastic Products and Professional Goods – the additional growth effect exceeds 3 percent per year (obviously, for some of the industries the effect is negligible).[13]

The main conclusion from this exercise is that the potential growth benefits of financial integration are considerable both at the country and the industry level, and that they are not evenly distributed across countries and across sectors.

5.2. Improving the institutional determinants of financial development in the EU

It can be argued that the previous estimates tend to exaggerate the growth benefits of policy actions aimed at promoting financial markets integration because financial integration in not under complete control of policy makers but depends also on spontaneous market developments. In other words, the previous experiment implicitly assumes that domestic financial development is a control variable.

In this section, we simulate the growth effects of letting the determinants of financial developments that are under policy control converge to the highest European standard. To

[12] The countries that benefit most are also those more financially backward, i.e. Italy, Belgium, Denmark, and Greece. Indeed, the average external dependence of these country equals the EU average (0.31), as in Italy, or it is lower than the average (Belgium, 0.30; Denmark, 0.29; Greece, 0.25).

perform this exercise, we first regress our measure of total financial development on a set of policy-controlled variables that literature has shown to be relevant for financial markets efficiency.[14] We assume that financial integration leads all integrating countries to adopt the highest value of these determinants in the EU. We then predict the implied value of financial development in each sector and country. Finally, we proceed as in the previous scenario to compute the growth effects.

The simulation clearly requires a regression relating financial development to its institutional determinants as an intermediate input. This is done in Table 5, which reports the results of the regression of financial development on creditor rights, the indicators of private and public enforcement, the two indicators of judicial efficiency (duration of judicial procedure and its cost), rule of law and dummies for the country's legal origin (the latter two variables are not under policy control). Focusing on the robust regressions (second column), German legal origin, the indicators of private and public enforcement, duration and cost of trials and rule of law appear as the key variables in predicting financial development.[15]

Figure 3 shows the effects on country growth when the two measures of enforcement (private and public enforcement), the duration and cost of judicial procedures and creditors rights are simultaneously set at the maximum level within the EU countries. The other variables (rule of law and legal origin) are assumed to be outside policy control. Compared with the previous scenario, there are some noteworthy differences. First, as one would expect, the growth effects are smaller than when financial development is raised to the U.S. standards. Averaging over all European countries and sectors, growth of value added increases by 0.59 percentage points (down by 0.13 percentage points with respect to the first scenario), and output growth increases by 0.73 percentage points (down by 0.16 points). Second, the two countries that gain most in terms of growth are Germany and Austria. Third, in this experiment even the Netherlands benefit though still less than other countries but as much as

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13 These industries rely highly on external finance. However, the benefit is also large for the Electric Machinery industry, whose reliance on external finance is much lower but is very important in more financially backward countries such as Austria, Belgium and Italy.

[14] In practice, this is the first-stage regression of our IV procedure in column (3) of Table 6 with the omission of per capita GDP and schooling.

[15] The regression is robust to the presence of influential values. We estimate an OLS regression, compute the Cook's distance and exclude any observation for which the Cook's distance is greater than 1. After excluding potentially influential outliers, we proceed in two steps. We run iteratively least squares regressions weighting the observations with Huber weights. After convergence is reached we construct bi-weights with which we re-weight the observations. We finally run iteratively least squares until convergence is reached. Using a LAD regression we get similar results.

Denmark and France. The group of countries that benefit the least now includes (in decreasing order) Portugal, Ireland, Spain, France, Denmark, the Netherlands and the U.K. The fact that the U.K. and some of the Scandinavian countries gain the least in this simulation reflects the fact that their regulatory framework and its effectiveness are already quite high. Furthermore, Ireland, Spain and France gain less than other countries, such as Sweden or Finland, because their degree of financial development is high compared to that they would reach by raising the determinants of financial development to the maximum EU standards and keeping all the other things equal.

Figure 4 shows the effects on the nine sectors that contribute most to the European growth rate. Raising the institutional determinants of financial development, rather than in financial development itself, reduces the absolute size of the effects only slightly. The reason is that the countries that would benefit most from the regulatory improvements are also those where financial development is more limited.

6. Firm-level results

In this section we apply the approach laid out in Section 3 to a large international panel of firm-level data for companies in EU and transition countries. There are two reasons for extending to firm-level data the same method used for industry data. First, we can test the robustness of the conclusions reached on the basis of industry-level data. As will be seen, apart from the obvious difference in their level of aggregation, our firm-level data differ in several dimensions from the industry-level data analyzed so far. They refer to a later period, with no overlapping years, spanning 1996-2001, while the UNIDO industry-level data cover the 1981-95 period. Moreover, they refer to a partly different set of countries. They do not include non-European countries, which form the only intersection between the two data sets, but include most former socialist European economies, none of which was present in the industry-level data. This will allow us to estimate the growth impact of financial integration in the accession countries.

A second reason for using firm-level data is that they allow us to check whether financial development affects differentially firms belonging to different size classes, and not only to different industries. Finding differences in the effect of financial dependence on firm's growth according to size would strengthen the causal interpretation of our regressions. Theoretically, we do not expect all firms to be equally affected by national financial

development. Larger firms can more easily raise funds in markets far from their main headquarters. Therefore, if finance affects growth we expect the effect of national financial development to be mostly concentrated among smaller firms.

We draw firm-level data for employees, sales, and value added from the Amadeus Top 200,000 company database of Bureau Van Dijck. Due to missing values, changes in the definitions and our choice to focus only on the manufacturing sector, the number of firms for which observations can be used is reduced to 70,679 firms.[16]

The maximum interval for which data are observed for a firm is 1996-2001, but for many firms the time interval over which data are available is shorter. Thus, the average growth rates for each individual firm are computed using the available sample for each firm, and are therefore estimated with different number of observations. Of course, the shorter the time interval over which the averages are computed, the more precisely the average is measured. But the resulting data set is a cross-section, and the asymptotic properties of the estimates depend only on the total number of firms.[17] The fact that growth rates may be measured with different precision for different firms does not pose particular problems, because the OLS estimates accommodate measurement error in the left-hand variable. As in the industry level-analysis, the growth variable is merged with country-level data on indicators of financial development and sector-level data on financial dependence.[18]

Table 6 shows the distribution of companies across countries, as well their average sales growth by country, and the two basic indicators of financial development – bank credit and stock market capitalization scaled by GDP. Iceland, Ireland, Latvia, Norway, Russian

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[16] The Top 200,000 version of the Amadeus database covers European companies from the following countries: Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, FYR, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, Yugoslavia, FR (Serbia/Montenegro). To be included in the Amadeus sample, companies must satisfy the following criteria. For the UK, Germany, France, Italy, Ukraine and Russian Federation, operating revenue must be at least € 15 million, total assets at least € 30 million, and the number of employees must be at least 150. For companies in other countries, operating revenue must be to at least 10 million, total assets at least € 20 million, and the number of employees at least 100.

[17] We focus on the growth rate of sales, rather than on other indicators of firms' growth such as value added. Value added statistics from balance sheet information suffer from differences in accounting practices and methodologies both across firms and countries, resulting in large measurement errors and thus downward biased estimates. Differences in methodologies are less of an issue with sales, which is the least ambiguous accounting concept and the variable that is more readily comparable across countries with different accounting standards.

[18] The data on financial development used in the firm-level analysis are drawn from the Word Development Indicators (2001), a database maintained by the World Bank, which covers 207 countries and provide data from 1960. From this database, we extract the market capitalization of listed companies and the domestic credit provided by the bank sector, both as percentage of GDP.

Federation, and Slovenia are excluded from the analysis (and therefore do not appear in Table 6) because the growth rates of sales and value added are entirely missing for their firms. Bosnia-Herzegovina and Yugoslavia (Serbia/Montenegro) are excluded because indicators of financial development are not available. This reduces the total number of countries included in the empirical analysis to 26.

The statistics in Table 6 show that average growth rates differ considerably depending on whether one computes them from sales or from value added data. Also, unsurprisingly most former socialist countries are far less financially developed than EU countries. Finally, there are large international differences in firm size, as measured by the number of employees of the median firm.

Table 7 reports OLS regressions where the dependent variable is each firm's average growth rate of sales over the 1996-2001 interval (or a shorter interval, as dictated by data availability). To compute yearly growth rates, in the regressions we use only data for firms for which at least two adjacent observations are available. As a result, the number of observations used in the estimation is considerably lower than in Table 6.

The first three columns differ for the indicator of financial development in the interaction term with external dependence: stock market capitalization, domestic credit to the private sector, and the sum of the two. The fourth column reports a test of whether financial development has a different growth impact in transition economies. All regressions include country and industry fixed effects. Thus, any difference in firms growth due to differences in common factors within countries (such as inflation) is captured by the country dummies.

The results are largely consistent with those obtained from the industry-level data and presented in Section 3. The coefficient of the interaction term is positive and precisely estimated in all regressions. The size of the coefficient is of the same order of magnitude as in the industry-level estimates. The R^2 of the OLS regressions is very small, due to the presence of a large firm-specific noise that was absent in the industry data as a result of aggregation.

Table 8 reports the results of Least Absolute Deviation (LAD) estimates, which are robust to the presence of influential values. The coefficients of these regressions are smaller but also much more precise than the OLS estimates. The estimates in column (4) indicate that financial development does not have a different impact in former socialist economies.

This set of estimates allows us to assess the effect of financial integration on accession countries, since the latter are included in the micro data but not in the UNIDO industry-level

data. Figure 5 shows the effect of raising financial development to the US level and to the average EU level, respectively, for the sales growth of several EU accession countries. In both cases, there is significant growth gain in all accession countries, of roughly comparable size across them. However, the growth gain implied by assuming their convergence to the average EU level is only half to a third of the gain estimated when assuming their convergence to the U.S. level. Figure 6 shows similar simulations of the sales growth effect for the 9 most affected industries in these countries. In this case, the industries that gain more are those that produce professional goods and motor vehicles.

Our last test of the effect of financial development on growth is presented in Table 9. We split the sample along the size dimension, and estimate two separate regressions, respectively for firms above and below 200 employees. For the reasons explained above, we report only regressions using the growth rate of sales as the dependent variable. We find that financial development indicator (interacted with financial dependence) has a much larger impact in the sample with small firms, regardless of the estimation method. In the OLS regressions the effect of financial development on large firms growth does not differ statistically from zero. In the LAD estimates it is only half the effect on small firms.

These results support the hypothesis that financial development constrains more severely the growth of small and medium enterprises (SMEs), and therefore that financial imperfections take a heavier toll in countries where SMEs are more prominent in the population of firms. From Table 9, this appears to be the case in Austria, Belgium, Greece, Italy, Spain, and Sweden, where the median firm is smaller than in the rest of the sample. As a result, a given improvement in domestic financial development should be expected to have a larger impact in these countries.

However, insofar as we are dealing with SMEs, one should refrain from rushing to the conclusion that these countries will also benefit more from EU financial integration. The effect might be attenuated, unless financial integration results in an improvement in these countries' domestic financial markets. The reason is that, as argued in Section 4, SMEs are less likely than other firms to access foreign capital markets or borrow from foreign banks, and therefore to reap the benefits of an integrated EU financial market. For such companies, the assumption made in Section 4 that access to a developed EU capital market is equivalent to access to a developed domestic capital market is less likely to be met. Therefore, the results

in Table 9 suggest that the simulations in Section 4 may overestimate the growth payoff of EU financial integration, especially for countries that include a large proportion of SMEs.

The magnitude of the potential overestimate largely depends on the form that financial market integration will take in these countries. It will be low if integration will attenuate geographical segmentation, so that also small firms will gain from it. How much they will benefit actually depends on the form financial integration takes. If it occurs via massive entry of highly efficient intermediaries in previously protected markets dominated by inefficient local banks, small businesses will benefit a lot. If instead integration will occur by giving firms access to other countries securities markets (e.g. place bonds in other EU countries), then only large businesses will benefit. It is reasonable to expect both forms of integration to occur, so that both large and small businesses will benefit. Of course, smaller businesses could benefit more if they were initially more constrained by lack of financial development of their national markets.

7. Political economy obstacles to EU financial integration

The results from the simulations in the previous sections raise some important issues. If the main beneficiaries of financial market integration are the financially underdeveloped members of the EU, why should more financially developed EU countries support financial market integration? More generally, does financial integration benefit (and is thus welcome by) everybody, or does it hurt some groups or hinder vested interests creating lobbies that oppose to it?

These political economy issues are important in light of the fact that financial integration is only partly driven by spontaneous market developments. Much of it – as can be gauged by Table 5 – stems from regulatory intervention and financial reform. And changes in regulatory intervention and financial reform may not necessarily benefit all agents in a country nor all countries that are supposed to converge. Rather, financial reform will not normally be a Pareto-improving process. As a consequence, it will create not only winners but also some losers and these will oppose to it. Obviously, whether opposition will actually succeed will also depend on how much pressure the potential beneficiaries can exert as well as on the details of the working of the political process, including possible direct incentives that national politicians may have to oppose or favor financial reform and integration.

There are two reasons for worrying about these issues in this context. First, as we discuss below, ignoring these "distributional" issues may affect the estimates of the relative growth benefits from financial integration as computed in the previous section. Second, if financial integration threatens some groups, opposition to it (even if ultimately unsuccessful) may delay financial integration and thus the eventual growth effects. In simulating the impact of financial integration on economic growth, we definitely ignore dynamics. But this needs to be borne in mind in order to produce a realistic prediction of the effects of financial integration. Furthermore, the more benefits are delayed, the weaker may become the support to financial reform and to policy measures aimed to achieve integration.

Delays in integration may actually be substantial even when accompanied by political and monetary unification, the latter being already achieved in (a subset of) the EU. As Toniolo et al. (2003) show, Italy was able to achieve integration in the bond market only more than 20 years after unification in 1861 and in spite of having a single currency. Interestingly, as they argue, the reason was that those who made a living out of the stock exchanges (there were 6 exchanges at the time of Italy's unification) opposed the creation of the infrastructure necessary for the emergence of a single financial market. These local vested interests were sufficiently strong to delay considerably financial integration. This was achieved only when "…a new legal framework was adopted which reduced considerably the scope or the self - protection by local vested interests". These issues may be much more relevant when integration concerns the banking industry and the stock market, since need for regulatory reform and legal infrastructure is certainly much more pronounced in these cases compared to the bonds market.

Resistance to financial reform and integration may come from both intermediaries and firms. Intermediaries that enjoy monopoly rents will see them threatened by new, potentially more efficient intermediaries brought about by the lifting of national barriers to entry that integration entails; accordingly, they will lobby to protect their rents. Businesses with monopoly power may join intermediaries. Financial integration, as we have argued, brings financial development to countries that lag behind on this dimension. In turn, as documented by Guiso, Sapienza and Zingales (2003), financial development facilitates the creation of new firms, as well as entry and growth of small businesses, threatening the profits of incumbents. Thus, established firms that enjoy monopoly power may oppose to financial integration. In

such circumstances, they may find an ally in their lenders as they too may have an incentive to protect the monopoly rents of their customers (Cestone and White, 2003).

Finally, and perhaps most importantly, resistance to financial integration may come from national governments. There at least two reasons why national governments may oppose integration: first, foreigners are less subject to control by national politicians and this reduces the amount of resources that politicians can extract from the financial industry. Second, if integration implies also a move away from banking finance in favor of market oriented finance, politicians (and thus governments) may oppose it because banks are more easily controllable than markets (Rajan and Zingales, 2003). The implication is that countries that are more bank-based are likely to oppose more (or offer less support) to financial integration.

Table 10 presents indicators related to the incentives that countries may have to oppose or favor financial integration. The first column shows the share of the bank loan market controlled by banks based in other European countries as of 2001. There is a remarkable home bias in banking: except for the UK, Ireland and Luxembourg, where EU banks have a market share of 23.7 percent, 11 percent and 18 percent, respectively, in the remaining countries the share of foreign banks is minuscule. This signals the presence of severe barriers to enter the national banking industry. The second to fifth columns report qualitative indicators of the efficiency of the banking industry, the stock market and venture capital finance in the EU15 countries and some Eastern European countries that are likely to join the EU in the future. For comparison, we report the indicator also for the US.[19] Scores are in the 1-10 scale, with scores closer to 10 meaning better financial institutions: easier access to bank finance (column 2), the stock market (column 4), venture capital finance (column 5) or better quality of banking services (column 3).

Two features are noteworthy: on average Europe scores less than the US in all types of finance but particularly with respect to access to the stock market and to venture capital. Second, there is remarkable diversity within Europe. For instance, Italy scores 5 in the ease with which money flows from banks to business, while the Netherlands score 7.9 and Finland 8.7. Differences are even more marked when one considers access to the stock market and to venture capital where several European countries report scores far below the US, which reports a score of around 8. The general pattern that emerges is one where Southern European

[19] These measures are average scores collected by the World Competitiveness Yearbook in 2002 among a sample of top managers interviewed in each country.

countries lag behind Nordic countries, which have better organized and more efficient financial systems.

One consequence of financial market integration is that countries with more efficient financial industries could gain market shares in those countries with less efficient industries. As a consequence, the financial industry in the latter countries is likely to oppose integration. European countries differ also in the relative importance of banking finance compared to market finance, and, as said, protection of the banking industry is likely to be a concern of national politicians more than protection of their stock market. Thus, countries with relatively large banking industries are likely to be less favorable to integration.

These forces, however, are counterbalanced by others working in the opposite direction. Since availability of finance differs across European countries, firms that can benefit from increased or easier availability of funds will push in favor of financial integration; for instance, small firms which are more likely to be constrained by the availability of finance within the national borders. As the last column shows, there is considerable diversity in average firm size (measured by the average number of employees), which is generally smaller precisely in those countries that, perhaps not surprising, lag behind in terms of financial development.

For instance, a country like Italy, where firms find it difficult to raise funds locally, has an average firm size of 4.4 employees and over 3,200,000 firms. In Germany, France and the United Kingdom – three countries with similar population size and comparable GDP per capita – the average firm has 10.3, 7.1 and 9.6 employees respectively, and there are less than half the number of firms as in Italy. This may lead to constituencies pushing for integration in countries with relatively small firms, which expect integration to reduce the cost of credit and increase its availability.

As already said, since backward countries are likely to benefit most from financial integration, it is important to understand why financially leading countries should not oppose it. There are three possible reasons why the latter may not oppose but actually support integration – perhaps more so than financially backward countries. First, even if in these countries manufacturing industry does not benefit from financial market integration, their financial industry should actually gain from integration. As argued, the efficient financial intermediaries of more advanced countries can expand abroad and gain a large market share at the expense of local institutions. Second, the enhanced competition and the economies of

scale in financial intermediation stemming from integration can improve the working of financial markets where they are already relatively developed.[20]

However potentially wide-ranging, the benefits of financial integration are most likely to be unevenly distributed, and some losers are likely to emerge. In countries that are less financially developed, the financial sector stands to lose market shares and profits. This may result in a powerful constituency lobbying against financial integration, or at least slowing down its progress. At the same time, the industrial sectors of these countries have an incentive to promote financial integration because integration gives them an opportunity to expand. So the overall balance of opinion in these countries will depend on whether the pro-integration pressure of industry will win over the anti-integration resistance of local finance.

In financially developed countries, the situation is likely be reversed: the financial sector will gain from integration, while industry will not gain much and may even lose from the increased competitiveness of foreign manufacturing producers, which will be able to access to hitherto inaccessible sources of financing. Therefore, in these countries finance is likely to be in favor of integration while industry may be less favorable or even oppose.

8. Summary

The regression and simulation analysis based on the UNIDO industry-level data suggest several conclusions about the effect of financial development on growth and about the likely effects of financial integration in the EU. Our estimates imply that gaps in national financial development matter for economic growth in the manufacturing sector and that these effects have not weakened in the early 1990s, when some financial integration occurred, suggesting that financial development can still affect growth.

[20] Our analysis in Section 4 does not account for these growth effects of financial development because our data refer to the manufacturing industry. However, for some financially developed countries these growth effects could be the most important factors at work. In particular, the financial service sector and the professional service sector in the UK may greatly benefit from financial integration in the EU. Conversely, the financial service industries of less financially developed countries may lose market shares and therefore face a downturn in their activity. While financial market integration should enhance the growth and formation of domestic firms in these countries, the same integration process is likely to hurt their financial industry. Therefore, the growth effect of financial integration in these countries is likely to be smaller than its effect on their manufacturing industry. In other words, insofar as they focus exclusively on manufacturing, our estimates are likely to underestimate the growth effects of financial integration for financially developed countries and to overestimate them for financially underdeveloped ones.

Our simulations suggest that the potential benefits from financial integration – interpreted as firms' access to a financial market similar to that of the U.S. (or of the most developed EU economies)– can have potentially large effects on countries and sectors growth. Simulation analysis also shows that the overall effect depends on which institutional determinant of financial development is varied to raise the current standards of the EU financial development. Unsurprisingly, the largest benefits accrue when all determinants are assumed to improve simultaneously. Overall, we estimate that the impact of raising financial development to the US level on the growth of European manufacturing industry is less than 1 percentage point per year (ranging from 0.6 to 0.7 percentage points depending on the assumed scenario). Of course, the effect would be smaller if financial integration were to occur at a lower level of financial development than that of the United States.

This overall growth effect results from rather different country and sector effects, a reflection of the heterogeneity of the EU in terms of sector composition and level of financial development. Countries that currently have a comparably weak financial structure (such as Belgium, Denmark, Greece and Italy) are predicted to benefit most, while those which have already achieved a relatively high level of financial development (such as the UK, Sweden and the Netherlands) are predicted to benefit little.

To a large extent, these results are confirmed by the estimates obtained using a large sample of firms in 26 countries. Both the sign and the estimated magnitude of the growth effect of financial development are consistent with those obtained from industry-level data. In this sample the effect appears to stem primarily from the effect of financial development on the sales growth of SMEs, defined as firms with less than 200 employees. This implies that countries with comparatively small firms (such Austria, Belgium, Greece, Italy, Spain, and Sweden) stand to gain more from domestic financial development. However, it also suggests that for these countries financial integration may have a smaller payoff than that implied by industry-level simulations, insofar as financial integration will not lead to domestic financial development but simply to improved access to international financial markets for their firms. The reason is that SMEs are likely to be the least able to take advantage of such improved access to foreign financial intermediaries and markets.

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Appendix: data sources for industry-level regressions

We merge four different data sets: (1) industry-level data on financial dependence; (2) country-level data on financial development and other indicators of the quality of institutions; (3) industry-level panel data on output, value added growth and number of firms; (4) country-level data on institutional variables that are likely to affect financial development. Here we describe the sources and main features of these data sets.

1. Value added, output, and number of firms

These data are drawn from Industrial Statistics Database (revision 2), which is produced by the United Nations Statistical Division (UNIDO) and covers 169 countries. To match industrial sector definitions with those for the sectors for which we have data on external dependence, we use both 3- and 4-digits ISIC codes. The 3-digits data span the 1963-99 period, while 4-digit data run from 1977 to 1999. The final sample includes data for 36 manufacturing industries, of which 27 are 3-digits and 9 are 4-digits. The sample has data on the number of establishments, number of employees, value added, output, gross capital formation, wages and number of females working. Value added and output are first expressed in U.S. dollars, and then converted in real figures using the U.S. Producer Price Index deflator.[21] In our basic specification we compute the growth rate of real value added (or output) as the difference of (log) real value added (output) in 1991 and 1981, respectively.

2. External dependence

Data on external dependence are taken from Rajan and Zingales (1998), who measure the dependence of US industries on external finance using the Compustat database. The external dependence of industry *j* is the share of capital expenditure that the median firm in the industry cannot finance through internal cash flow. The assumption is that for technological reasons (such as the completion period of an investment project, its refinancing needs, the distribution of cash flows over the lifetime of the project) some industries depend on external finance more than others. Rajan and Zingales note that where financial markets are well developed, as in the U.S., the supply of funds is very elastic, so that the use of external finance reflects primarily the demand for finance, rather than its supply. Hence, the identifying assumption is that differences across industries in financial dependence are mainly dictated by technological differences. To avoid biasing the measure of financial dependence with business cycle factors, the indicator is averaged over the 1980-90 period. Table A1 reports this measure of external dependence for 36 three or four digits ISIC sectors.

3. Financial development

Data on financial development are drawn from the database provided in the CD ROM that comes with the volume by Demirgüç-Kunt and Levine (2001). As discussed in Beck, Demirgüç-Kunt, Levine and Maksimovic (2001), there is no obvious way to measure financial development. To make our results comparable with those in the literature we use two measures of finance-activity to proxy financial development, namely, the ratio of stock market capitalization to GDP and the ratio of private credit to GDP, and one of and finance-size given simply by the sum of the previous two ratios. We also use as a third proxy an

[21] The latter is downloaded from the Federal Reserve Bank of Saint Louis web site (http://www.stls.frb.org/fred/).

indicator of the "quality of accounting standards", produced by International Accounting and Auditing Trends (Center for International Financial Analysis & Research, Inc.). This indicator rates companies' 1990 annual reports on the basis of their inclusion or omission of 90 items in the balance sheets and income statements, and ranges from 0 to 90. The 90 items are classified along 7 general dimensions: general information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items. Table A2 reports the ratio of stock market capitalization to GDP, the ratio of private credit to GDP, and accounting standards for each of the 60 countries that we include in our analysis. The figures in the first two columns are 1980-1995 averages, while those in the third column refer to 1990.[22]

4. Institutional variables

We use data on several variables to characterize the workings of a country institutions that are likely to directly affect the its degree of financial development.

1) We measure the degree of creditor rights protection by the index developed by La Porta et al. (1998) for 49 countries. To characterize the degree of creditor rights protection, they identify five features of the legal rules governing loan contracts, by asking if: (i) reorganization procedures require an automatic stay on the borrower's assets, preventing secured creditors from seizing collateral; (ii) the secured creditors' right to seize collateral is junior relative to those of the government and workers; (iii) management can obtain protection from creditors by starting a reorganization procedure without creditors' consent; (iv) management remains in charge during reorganization procedures; (v) firms must maintain a minimum capital to avoid automatic liquidation. Depending on how it fares on each of the first four criteria, each country receives a certain total score, which measures its degree of creditor rights protection, or "creditor rights" variable.

2) "Legal origin", built by La Porta et al. (1998), which classifies countries in four groups, depending on whether the origin of their legal system is Anglo-Saxon, French, German or Scandinavian.

3) We rely on several indicators to measure the quality of private and public enforcement and the efficiency and cost of the judicial protection:

- The index of private enforcement, which equals the arithmetic mean of (i) the disclosure index and (ii) the burden of proof index, drawn from La Porta, Lopez-de-Silanes and Shleifer (2003).
- The index of public enforcement, which equals the arithmetic mean of: (i) the supervisor characteristics index; (ii) the investigative powers index; (iii) the orders index; and (iv) the criminal index, drawn from the same source.
- Court efficiency, as measured by the total number of days it takes in each country to recoup a bounced check, taken from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003), Table 5, last column.

[22] The three variables are, respectively, the variables *mcap, privo* and *account* contained in the file *request80-95.xls* in the CD-Rom attached to Demirgüç-Kunt and Levine (2001).

- The cost of judicial proceedings, which is the cost of justice in a country as a percent of its GDP, drawn from the World Bank Doing Business Indicators, available at http://rru.worldbank.org/DoingBusiness/TopicReports.
- A measure of the "rule of law", which is an "evaluation of the legal and order tradition in the country"; the variable ranges from 1 (weak law and order tradition) to 10 (strong law and order tradition) and is published by the International Country Risk Guide (ICRG). We use the average of the 1982-95 values.

5. Other instruments

In some regressions, we use average years of schooling and per capita GDP as additional regressors. Average years of schooling in the total population over 25 in 1980 is drawn form Barro and Lee (1996). Real GDP per capita in 1980 is from Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.0, Center for International Comparisons at the University of Pennsylvania (CICUP), December 2001. Some of these variables are reported in Table A3**.**

Table 1
Financial Development and Growth of Industry Value Added

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Share of value added, 1981	-0.280	-0.277	-0.299	-0.368	-0.301
	(0.060)**	(0.054)**	(0.064)**	(0.081)**	(0.064)**
External dependence × market capitalization	0.038				
	(0.014)**				
External dependence × domestic credit private sector		0.035			
		(0.014)*			
External dependence × total finance			0.023		0.026
			(0.008)**		(0.009)**
External dependence × accounting standards				0.070	
				(0.037)*	
External dependence financial development × non-OECD dummy					-0.008
					(0.008)
Constant	-0.141	-0.151	-0.150	0.005	-0.150
	(0.095)	(0.094)	(0.095)	(0.037)	(0.095)
Observations	1593	1690	1571	995	1571
R^2	0.38	0.36	0.37	0.39	0.37

Note. The dependent variable is the growth rate of real value added for each ISIC industry in each country from 1981 to 1991. External dependence is the fraction of capital expenditure not financed with internal funding. All regressions contain a full set of country and industry dummies. Standard errors robust to unknown form of heteroskedasticity are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 2

Financial Development and Growth of Industry Output

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Share of output, 1981	-0.161	-0.166	-0.178	-0.276	-0.179
	(0.047)**	(0.047)**	(0.052)**	(0.109)*	(0.052)**
External dependence × market capitalization	0.042				
	(0.013)**				
External dependence × domestic credit private sector		0.040			
		(0.013)**			
External dependence × total finance			0.026		0.028
			(0.008)**		(0.008)**
External dependence × accounting standards				0.103	
				(0.038)**	
External dependence × financial development × non-OECD dummy					-0.006
					(0.008)
Constant	0.012	-0.061	-0.061	-0.026	-0.062
	(0.032)	(0.059)	(0.058)	(0.039)	(0.058)
Observations	1595	1721	1572	989	1572
R^2	0.38	0.36	0.37	0.43	0.37

Note. The dependent variable is the growth rate of real output for each ISIC industry in each country from 1981 to 1991. External dependence is the fraction of capital expenditure not financed with internal funding. All regressions contain a full set of country and industry dummies. Standard errors robust to unknown form of heteroskedasticity are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 3

Financial Development and Growth of Real Value Added: Instrumental Variable Estimates and Sensitivity Analysis

	(1)	*(2)*	*(3)*	*(4)* *1981-95*
Share of value added, 1981	-0.401	-0.303	-0.297	-0.302
	(0.081)**	(0.072)**	(0.072)**	(0.082)**
External dependence × total finance	0.033	0.036	0.028	0.038
	(0.011)**	(0.016)*	(0.013)*	(0.021)*
External dependence × schooling		0.001	0.001	0.006
		(0.003)	(0.003)	(0.004)
External dependence × log per capita GDP		-0.005	-0.001	-0.006
		(0.013)	(0.012)	(0.014)
Constant	0.035	0.084	0.053	0.064
	(0.020)	(0.133)	(0.123)	(0.147)
Observations	1154	1131	1131	926
Test of over-identifying restrictions	1.270	1.038	4.339	2.792
	(0.866)	(0.904)	(0.825)	(0.593)
Rank test	311.08	144.01	236.26	
	(0.000)	(0.000)	(0.000)	

Note. The dependent variable is the growth rate of real value added for each ISIC industry in each country from 1981 to 1991. In columns (1), (2) and (4), the instruments for financial development are dummies for the legal origin of the country (Anglo-Saxon, French, German and Scandinavian), and indicators of the rule of law and the degree of protection of creditor rights. In column (3) the instruments also include two indicators of shareholders' protection (private and public enforcement) and two indicators of judicial efficiency (duration in weeks of trials and cost of justice as a percentage of GDP). All regressions contain a full set of country and industry dummies. Standard errors robust to unknown form of heteroskedasticity are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 4

Financial Development and Growth of Industry Output: Instrumental Variable Estimates and Sensitivity Analysis

	(1)	*(2)*	*(3)*	*(4)* *1981-95*
Share of output, 1981	-0.254	-0.196	-0.195	-0.258
	(0.086)**	(0.064)**	(0.064)**	(0.089)**
External dependence × market capitalization	0.035	0.035	0.034	0.048
	(0.012)**	(0.015)*	(0.013)**	(0.020)*
External dependence × schooling		0.003	0.003	0.004
		(0.003)	(0.003)	(0.004)
External dependence × log per capita GDP		-0.006	-0.006	-0.015
		(0.012)	(0.011)	(0.014)
Constant	0.010	0.069	0.065	0.176
	(0.017)	(0.124)	(0.119)	(0.144)
Observations	1148	1125	1125	943
Test of over-identifying restrictions	4.655	3.534	5.899	5.226
	(0.324)	(0.4727)	(0.658)	(0.265)
Rank test	304.29	146.47	239.40	
	(0.000)	(0.000)	(0.000)	

Note. The dependent variable is the growth rate of real output for each ISIC industry in each country from 1981 to 1991. In columns (1), (2) and (4), the instruments for financial development are dummies for the legal origin of the country (Anglo-Saxon, French, German and Scandinavian), and indicators of the rule of law and the degree of protection of creditor rights. In column (3) the instruments also include two indicators of shareholders' protection (private and public enforcement) and two indicators of judicial efficiency (duration in weeks of trials and cost of justice as a percentage of GDP). All regressions contain a full set of country and industry dummies. Standard errors robust to unknown form of heteroskedasticity are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 5

The Determinants of Financial Development

	OLS Regression	*Robust Regression*
French legal origin	0.0195	0.066
	(0.254)	(0.145)
German legal origin	0.845	0.422
	(0.275)**	(0.155)**
Anglo-Saxon legal origin	0.289	0.085
	(0.286)	(0.162)
Creditor rights	0.008	0.018
	(0.061)	(0.034)
Rule of law	0.142	0.125
	(0.049)**	(0.030)**
Index of private enforcement	1.289**	0.768
	(0.422)	(0.241)**
Index of public enforcement	0.044	0.492
	(0.370)	(0.216)**
Duration of judicial procedure	-0.005	-0.004**
	(0.003)	(0.002)
Cost of judicial procedure	-0.241	-0.524
	(0.174)	(0.214)**
Constant	-0.470	-0.309
	(0.489)	(0.280)
Number of observations	44	44
R squared	0.68	

Note. The dependent variable is "total finance", the sum of stock market capitalization and domestic credit extended by banks and other financial institutions. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 6

Microeconomic Data: Summary Statistics

	Growth rate of sales	*Number of firms*	*Number of employees*	*Bank Credit as share of GDP*	*Market Capitalization / GDP*
Austria	0.0423	1507	136	1.2738	0.1549
Belgium	0.0289	2139	94	1.5116	0.5791
Bulgaria	0.2474	1297	200	0.5981	0.0287
Croatia	-0.0564	510	205	0.4714	0.1189
Czech Republic	0.0744	2111	200	0.6937	0.2398
Denmark		1058	163	0.5666	0.4654
Estonia	0.1226	221	161	0.2360	0.2246
Finland	0.0943	962	146	0.6202	0.9512
France	0.0472	6698	168	1.0177	0.5409
Germany	0.0286	12789	181	1.3407	0.3864
Greece	0.1030	707	129	0.9302	0.5101
Hungary	0.1851	1062	220	0.7129	0.1953
Italy	0.0479	8553	118	0.9463	0.3287
Lithuania	0.0810	322	263	0.1452	0.1044
Luxembourg	-0.0088	87	173	0.9075	1.8410
Macedonia, FYR	0.3012	66	349	0.3391	0.0106
Netherlands	0.0280	2132	158	1.1613	1.1893
Poland	0.0629	3699	240	0.3547	0.0895
Portugal	0.0463	946	184	0.9299	0.3484
Romania	0.2188	2412	233	0.2179	0.0127
Slovak Republic	0.0137	506	250	0.5989	0.0707
Spain	0.1274	5553	105	1.0424	0.4965
Sweden		1888	125	1.1899	1.0338
Switzerland	0.0915	1571	203	1.8239	1.9023
Ukraine	0.0598	2564	364	0.2033	0.0369
United Kingdom		9319	225	1.2387	1.5206

Note. The first column reports the average growth rate of sales, the second the average growth rate of value added, the third the number of firms in each country, the fourth the number of employees of the median firm in each country and the fifth and sixth the bank credit and the market capitalization, respectively, divided by GDP. Iceland, Ireland, Latvia, Norway, Russian Federation, and Slovenia are excluded from the analysis because the growth rates are not available; Bosnia-Herzegovina and Yugoslavia (Serbia/Montenegro) are excluded because data on financial development are not available.

Table 7

Microeconomic Data. Financial Development and Growth Rate of Sales: Ordinary Least Squares Regressions

	(1)	*(2)*	*(3)*	*(4)*
External dependence × market capitalization	0.056 (0.023)*			
External dependence × domestic credit private sector		0.061 (0.025)*		
External dependence × financial development			0.037 (0.014)*	0.039 (0.019)*
External dependence × financial development × transition economies				0.006 (0.036)
Constant	-0.028 (0.094)	-0.019 (0.094)	-0.029 (0.094)	-0.031 (0.095)
Observations	39339	39339	39339	39339
R^2	0.02	0.02	0.02	0.02

Note. The dependent variable is the firms' average growth rate of sales from 1996 to 2001. Each regression includes a full set of country and sector dummies. Robust standard errors are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 8

Microeconomic Data. Financial Development and Growth Rate of Sales: Least Absolute Deviation Regressions

	(1)	*(2)*	*(3)*	*(4)*
External dependence × market capitalization	0.025 (0.004)**			
External dependence × domestic credit private sector		0.034 (0.003)**		
External dependence × financial development			0.019 (0.002)**	0.022 (0.002)**
External dependence × financial development × transition economies				0.007 (0.005)
Constant	-0.053 (0.010)**	-0.050 (0.011)**	-0.053 (0.011)**	-0.052 (0.011)**
Observations	39339	39339	39339	39339

Note. The dependent variable is the firms' average growth rate of sales from 1996 to 2001. Each regression includes a full set of country and sector dummies. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 9

Microeconomic Data: Financial Development and Growth, by Firms' Size

	Growth of Sales			
	OLS Regression		LAD Regression	
	Small firms	Large firms	Small firms	Large firms
External dependence × financial development	0.057 (0.021)**	0.004 (0.017)	0.025 (0.004)**	0.012 (0.006)*
Constant	0.202 (0.130)	0.886 (0.591)	-0.014 (0.053)	0.103 (0.066)
Observations	28982	10357	28982	10357
R^2	0.04	0.02		

Note. The dependent variable is the firms' average growth rate of sales from 1996 to 2001. Firms' size is defined on the basis of the average number of employees between 1996 and 2001. Small firms have less than 400 employees, large firms more than 400 employees. Each regression includes a full set of country and sector dummies. Robust standard errors are reported in parenthesis. Two stars denote that the coefficient is statistically different from zero at the 1 percent level, one star at the 5 percent level.

Table 10

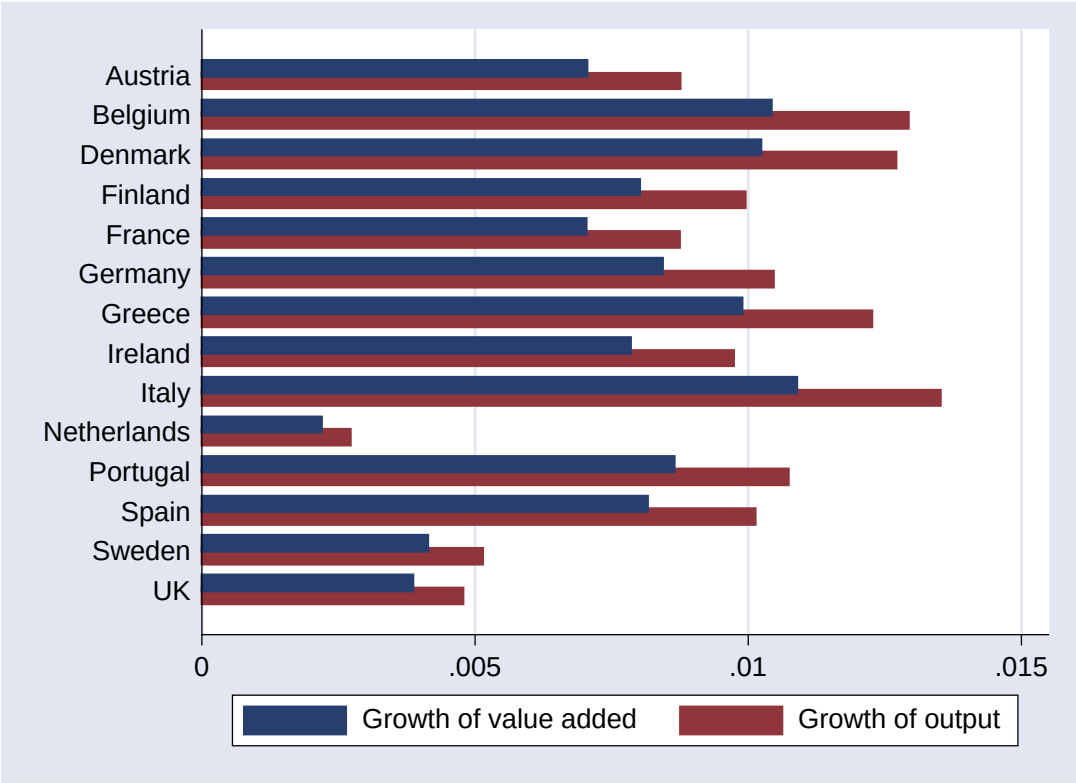
Indicators of Incentives to Favor Financial Integration in Europe

	Share of assets from EU banks	*Access to the loan market*	*Quality of banking services*	*Access to the stock market*	*Access to venture capital*	*Average firm size*
	(1)	(2)	(3)	(4)	(5)	(6)
Belgium	3.84	6.26	8.70	5.57	5.29	12.5
France	3.18	6.30	7.68	7.18	5.33	7.1
Germany	1.46	6.26	8.33	7.46	5.88	10.3
Italy	5.60	5.01	5.51	4.39	4.10	4.4
Netherlands	2.18	7.91	8.75	7.97	7.38	11.9
Luxembourg	18.16	7.49	9.30	6.09	5.58	-
Denmark	4.20	7.82	8.87	6.94	6.13	11.5
Ireland	11.00	7.43	8.07	6.04	6.67	-
United Kingdom	23.72	6.86	8.67	7.31	6.58	9.6
Portugal	4.20	6.33	7.92	4.25	4.58	6.0
Spain	4.07	6.59	8.03	6.25	4.89	4.0
Greece	4.41	6.06	7.03	5.72	4.63	38.8
Austria	0.79	7.23	9.00	4.77	5.08	62.8
Sweden	2.88	7.57	8.77	8.07	6.67	10.4
Finland	5.65	8.65	9.56	7.97	7.71	5.7
European Union	6.36	6.92	8.28	6.22	5.76	14.5
Norway	-	7.39	8.66	6.13	5.24	8.3
Poland	-	3.39	6.38	3.97	3.42	-
Slovenia	-	8.18	5.02	3.52	3.66	-
Slovak Republic	-	3.32	7.25	2.03	3.07	-
Czech Republic	-	4.16	5.89	2.17	3.17	-
Hungary	-	4.52	7.11	3.63	3.48	-
Estonia	-	7.29	9.22	4.20	4.82	-
Eastern Europe	-	5.14	6.81	3.25	3.60	-
United States	-	8.63	9.41	8.74	8.21	-

Note. The first column reports the share of assets from other EU banks in 2002 and is computed from European Central Bank (2002), Tables 8 and 15; for Sweden the figure refers to 1999. The indicators in columns (2) to (5) are from the *World Competitiveness Yearbook*, 2002. Columns (2) and (3) report qualitative indicators of efficiency of the banking industry: an indicator of the easiness in the access to the loans market; the second is an indicator of the quality of banking services. They are obtained from the responses of the interviewed individuals in each country to questions of the type "How do you judge access to the loans market (quality of the banking services) in your country?". A score close to 10 means that money flows easily from banking to business (quality of banking services is good); a score close to 1 means that money does not flow from banking to business (quality is poor). Columns (4) and (5) report qualitative indicators of access to the stock market and to venture capital finance. It is the average score reported by the interviewers to questions of the type "How do you judge access to the stock market (to venture capital finance) in your country?". A score close to 10 means that stock market provides adequate funds (venture capital is easily available); a score close to 1 means that the stock market does not provide enough funding (access to venture capital is difficult). Column (6) reports the average firm size and is obtained from Enterprises in Europe.

Figure 1

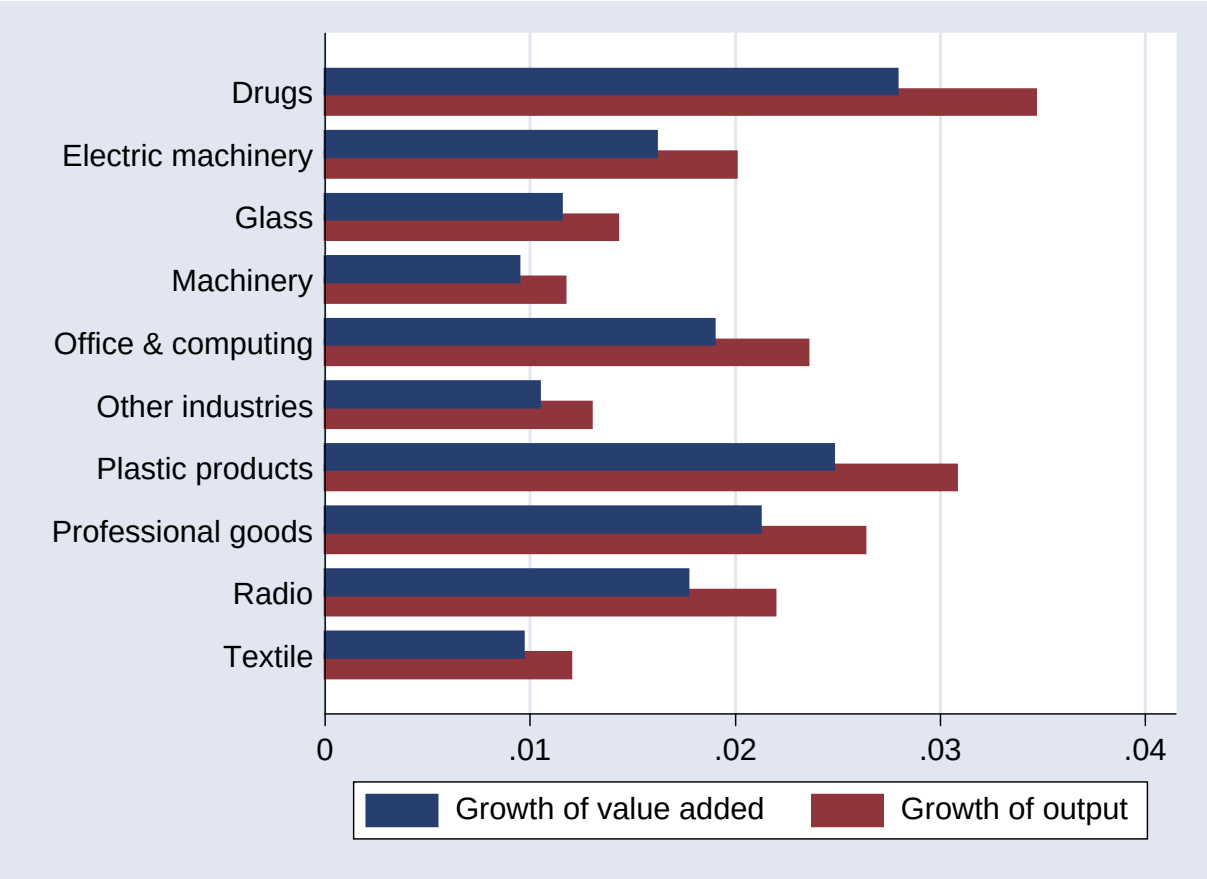
Potential Growth of Value Added and Output in the Manufacturing Industry by Country: Raising Financial Development to the US Standard



Note. The graph displays the potential growth of value added and output in the manufacturing industry by country if the degree of financial development is raised to the level prevailing in the US.

Figure 2

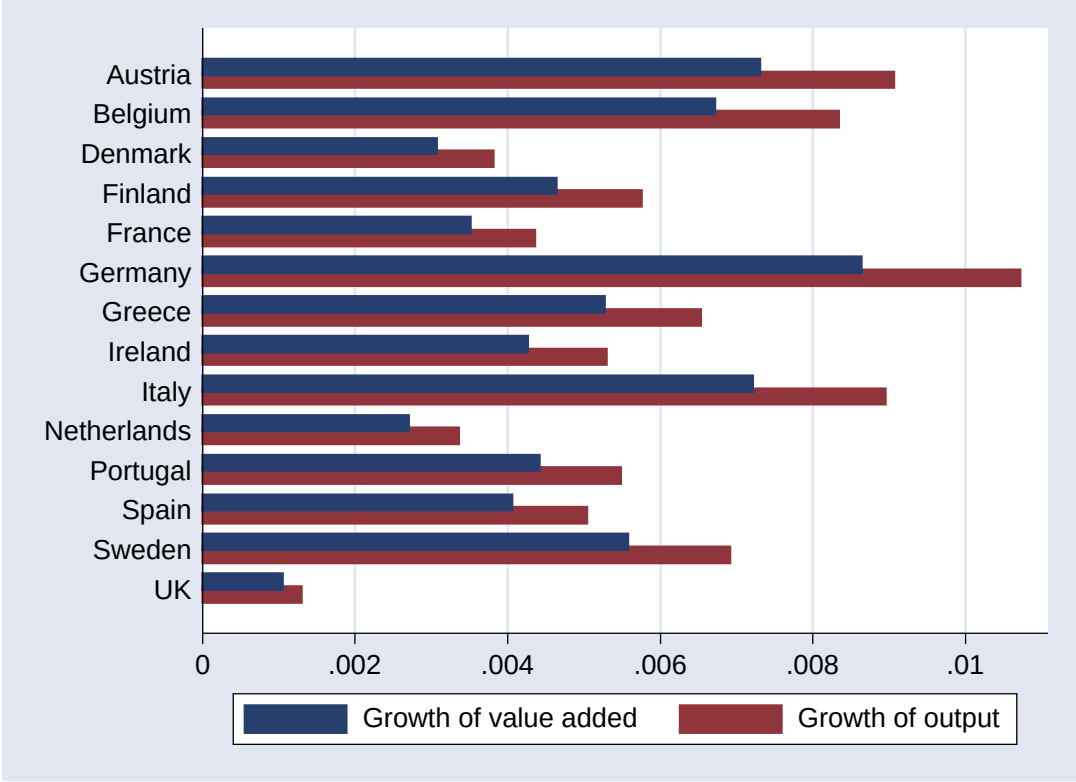
Potential Growth of Value Added and Output in the Manufacturing Industry by Sector: Raising Financial Development to the US Standard



Note. The graph displays the potential growth of value added and output in the manufacturing industry by sector if the degree of financial development is raised to the US level. We report the potential growth of value added and output for the ten most growing sectors.

Figure 3

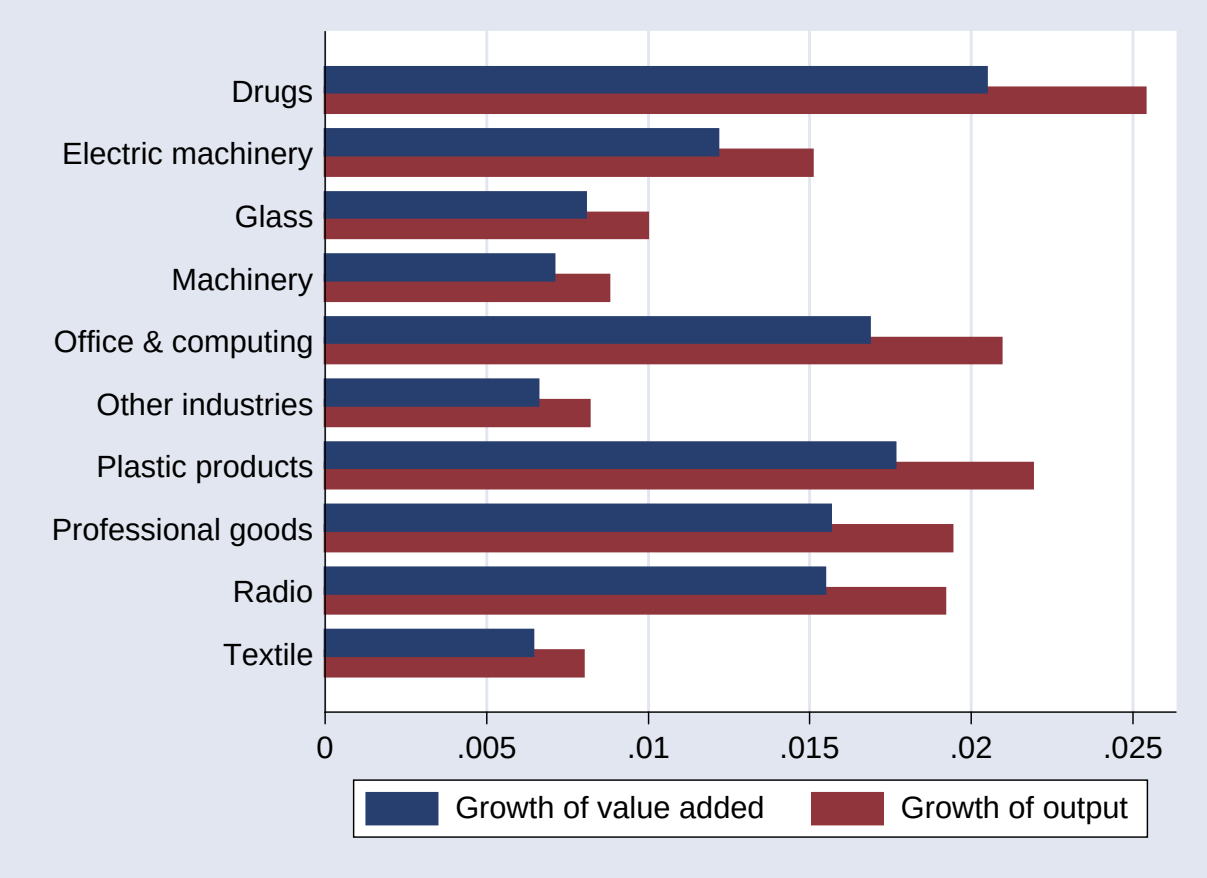
Potential Growth of Value Added and Output in the Manufacturing Industry by Country: Raising the Determinants of Financial Development to the Maximum EU Standard



Note. The graph displays the potential growth of value added and output in the manufacturing industry by country if the determinants of financial development (degree of creditors' protection, degree of shareholders' protection and judicial efficiency) are raised to the maximum EU standard.

Figure 4

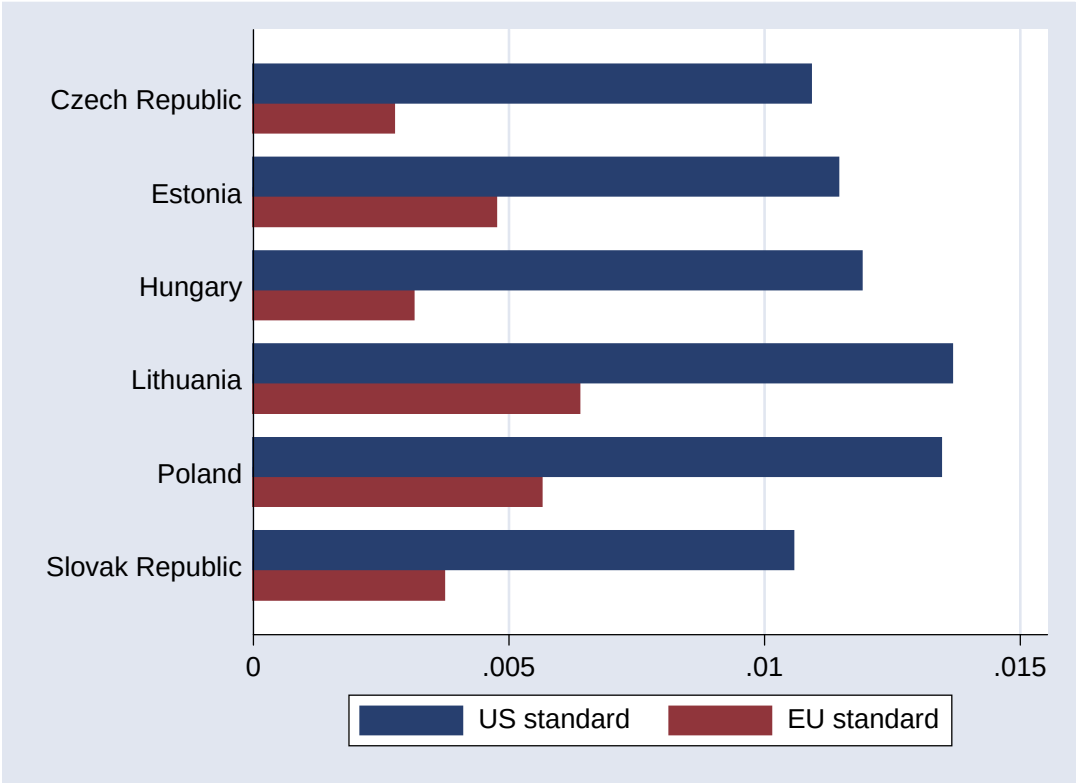
Potential Growth of Value Added and Output in the Manufacturing Industry by Sector: Raising the Determinants of Financial Development to the Maximum EU Standard



Note. The graph displays the potential growth of value added and output in the manufacturing industry by sector if the determinants of financial development (degree of creditors' protection, degree of shareholders' protection and judicial efficiency) are raised to the maximum EU standard. We report the potential growth of value added and output for the ten most growing sectors.

Figure 5

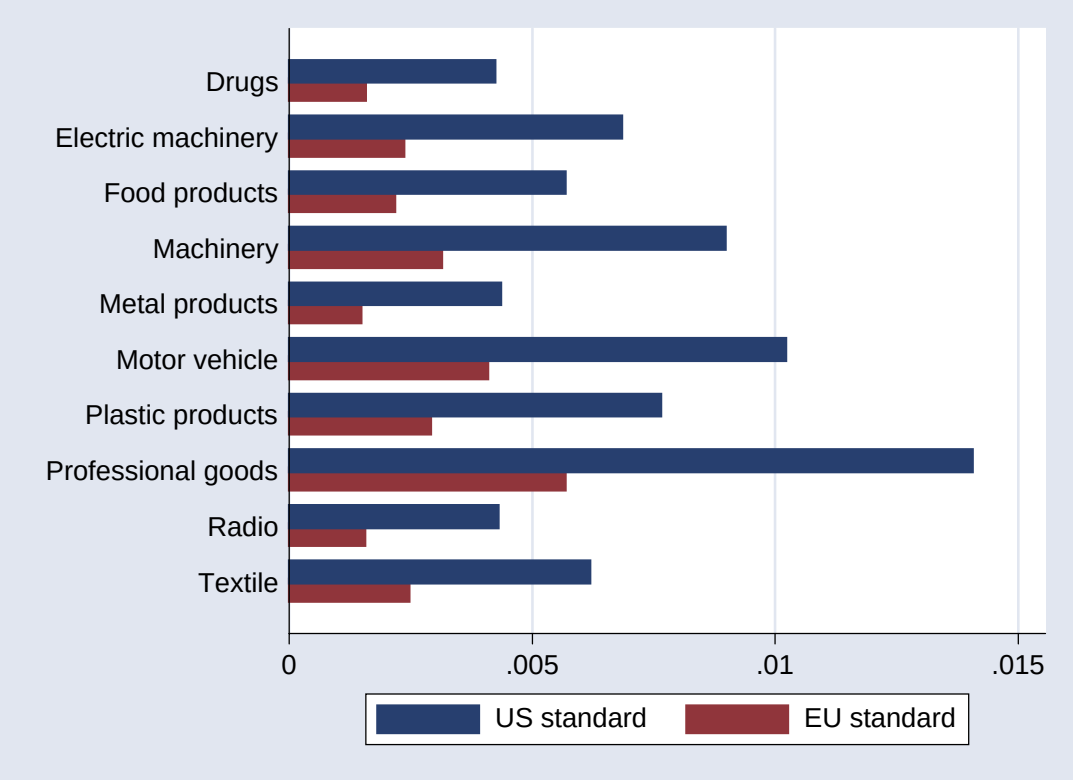
Potential Country Growth of Sales in the Manufacturing Industry for the Accession Countries: Raising Financial Development to the US and to the Average EU Standards



Note. The graph displays the potential country growth of sales in the manufacturing industry for a subset of accession countries if the degree of financial development is raised to the US level and to the average EU level.

Figure 6

Potential Sector Growth of Sales in the Manufacturing Industry for the Accession Countries: Raising Financial Development to the US and to the Average EU Standards



Note. The graph displays the potential sector growth of sales in the manufacturing industry for a subset of accession countries if the degree of financial development is raised to the US level and to the average EU level. We report the potential growth of value added and output for the ten most growing sectors.

Table A1

Indicator of External Dependence

Industry	ISIC code	External dependence
Apparel	322	0.03
Basics ex. fert.	3511	0.25
Beverage	313	0.08
Drugs	3522	1.49
Electric machinery	383	0.77
Food products	311	0.14
Footwear	324	-0.08
Furniture	332	0.24
Glass	362	0.53
Iron and steel	371	0.09
Leather	323	-0.14
Machinery	382	0.45
Metal products	381	0.24
Motor vehicle	3843	0.39
Nonferrous metal	372	0.01
Non-metal products	369	0.06
Office & computing	3825	1.06
Other chemicals	352	0.22
Other industries	390	0.47
Paper prod.	341	0.18
Petroleum and coal products	354	0.33
Petroleum ref.	353	0.04
Plastic products	356	1.14
Pottery	361	-0.15
Printing and publishing	342	0.2
Professional goods	385	0.96
Pulp paper	3411	0.15
Radio	3832	1.04
Rubber products	355	0.23
Ship	3841	0.46
Spinning	3211	-0.09
Synthetic resins	3513	0.16
Textile	321	0.4
Tobacco	314	-0.45
Transport. equip.	384	0.31
Wood products	331	0.28

Note. The index of financial dependence is defined as capital expenditures *minus* net cash flow from operations, all scaled by capital expenditures. The figures in this table are drawn from Table 1 in Rajan and Zingales (1998).

Table A2

Indicators of Financial Development

Country	Stock market capitalization (1980-95 average)	Claims of banks and other financial institutions (1980-95 average)	Accounting standards (1990)
Australia	0.43	0.81	75
Austria	0.07	0.87	54
Bangladesh	0.01	0.16	
Barbados	0.21	0.40	
Belgium	0.26	0.37	61
Bolivia	0.01	0.20	
Brazil	0.12	0.25	54
Canada	0.45	0.77	74
Chile	0.43	0.50	52
Colombia	0.06	0.27	50
Costa Rica	0.05	0.17	
Cote d'Ivoire	0.04	0.35	
Cyprus	0.19	0.77	
Denmark	0.22	0.41	62
Ecuador	0.10	0.19	
Egypt	0.05	0.28	24
Fiji	0.02	0.30	
Finland	0.18	0.67	77
France	0.20	0.91	69
Germany	0.19	0.92	62
Greece	0.08	0.40	55
Honduras	0.05	0.29	
Iceland	0.09	0.39	
India	0.13	0.27	57
Indonesia	0.05	0.26	
Iran	0.04	0.30	
Ireland	0.26	0.62	
Israel	0.29	0.50	64
Italy	0.12	0.50	62
Jamaica	0.24	0.28	
Japan	0.73	1.69	65
Jordan	0.52	0.62	
Kenya	0.12	0.29	
Korea	0.24	0.81	62
Luxembourg	2.14	0.24	
Malaysia	1.07	0.80	76
Mauritius	0.22	0.29	
Mexico	0.14	0.18	60
Netherlands	0.41	1.28	64
New Zealand	0.40	0.54	70
Nigeria	0.04	0.15	59
Norway	0.15	0.88	74
Pakistan	0.09	0.23	
Panama	0.07	0.51	
Paraguay	0.01	0.16	
Philippines	0.21	0.29	65
Portugal	0.08	0.63	36

Singapore	1.23	0.95	78
South Africa	1.31	0.79	70
Spain	0.18	0.72	64
Sri Lanka	0.13	0.19	
Sudan		0.09	
Suriname		0.37	
Sweden	0.38	1.09	83
Trinidad	0.11	0.50	
Tunisia	0.08	0.56	
Turkey	0.06	0.14	51
U.K.	0.76	0.74	78
U.S.A.	0.58	1.51	71
Uruguay	0.01	0.31	31
Venezuela	0.08	0.39	40
Zimbabwe	0.13	0.22	

Note. The figures in this table are drawn from the database in the CD-Rom accompanying Demirgüç-Kunt and Levine (2001). The three variables are *mcap*, *privo* and *account* contained in the file *request80-95.xls* in the database.

Table A3

Institutional Variables

Country	Creditor rights	Private enforcement	Public enforcement	Duration of judicial process	Cost of judicial process	Rule of law
Australia	1	0.70	0.90	320	8	6
Austria	3	0.18	0.19	434	1	6
Bangladesh				270	270.3	1.36
Barbados						
Belgium	2	0.43	0.19	365	9.1	6
Bolivia				464	5.3	1.32
Canada	1	0.96	0.86	425	28	6
Chile	2	0.46	0.54	200	14.7	4.21
Colombia	0	0.26	0.52	527	5.9	1.25
Costa Rica				370	22.6	4
Cote d'Ivoire				150	83.3	3.38
Cyprus						3.59
Denmark	3	0.68	0.27	83	3.8	6
Ecuador	4	0.11	0.44	332	10.5	4
Egypt	4	0.36	0.33	202	30.7	2.5
Fiji						
Finland	1	0.58	0.35	240	15.8	6
France	0	0.49	0.80	210	3.8	5.39
Germany	3	0.21	0.25	154	6	5.53
Greece	1	0.39	0.35	315	8.2	3.71
Honduras				225	6.7	2.07
Iceland						6
India	4	0.79	0.72	365	95	2.5
Indonesia	4	0.58	0.56	225	269	2.39
Iran				150	5.8	
Ireland	1	0.61	0.27	183	7.2	4.68
Israel	4	0.66	0.75	315	34.1	2.89
Italy	2	0.44	0.38	645	3.9	5
Jamaica				202	42.1	2.11
Japan	2	0.70	0.00	60	6.4	5.39
Jordan		0.44	0.54	147	.3	2.61

Kenya	4	0.47	0.67	255	49.5	3.25
Korea	3	0.70	0.29	75	4.5	3.21
Kuwait				195	4.4	
Malaysia	4	0.79	0.84	270	19.4	4.07
Mauritius						
Mexico	0	0.35	0.25	325	10	3.21
Netherlands	2	0.75	0.38	39	.5	6
New Zealand	3	0.55	0.40	50	11.6	6
Nigeria	4	0.55	0.28	730	6.6	1.64
Norway	2	0.51	0.40	87	10.4	6
Pakistan	4	0.51	0.50	365	45.8	1.82
Panama				197	20	2.11
Paraguay				188	34	2.46
Philippines	0	0.92	0.81	164	103.7	1.64
Portugal	1	0.54	0.50	420	4.9	5.21
Singapore	4	0.83	0.88	50	14.4	5.14
South Africa	3	0.75	0.29	207	16.7	2.65
Spain	2	0.58	0.38	147	10.7	4.68
Sri Lanka	3	0.60	0.33	440	7.6	1.14
Swaziland						
Sweden	2	0.46	0.44	190	7.6	6
Trinidad						4
Tunisia				7	4.1	2.78
Turkey	2	0.36	0.56	105	5.4	3.11
UK	4	0.75	0.67	101	.5	5.14
US	1	1	0.87	365	0.4	6
Uruguay	2	0.05	0.48	360	13.7	3
Venezuela		0.19	0.48	360	46.9	3.82
Zimbabwe	4	0.47	0.46	197	39.5	2.21