The Going Public Decision and the Structure of Equity Markets

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ABSTRACT

The industries in which listed firms are concentrated in less developed equity markets are not random, nor entirely explained by the underlying composition of production. Listed firms and market capitalization are disproportionately concentrated in industries with low beta (measured with their beta with the market portfolio in the U.S.). We document a strong positive relationship between the industry-weighted country beta and the degree of market development across countries. Recent IPO activity confirms the result since new listings have higher betas than the average firm already in the market.

Keywords: Risk Sharing, Development of Financial Markets, Composition of Equity Markets

1. Introduction

This paper documents the fact that the industries in which listed firms are concentrated in less developed markets are not random, nor entirely explained by the underlying composition of production. In particular, listed firms and market capitalization are disproportionately concentrated in industries that exhibit low betas —as measured by the beta of each industry with the market portfolio in the U.S. in the period 1973-2003, our benchmark of a complete financial market. We show that there is a strong positive relationship between the industry-weighted country beta and the degree of development of equity markets across 56 countries. Recent IPO activity confirms the result since new listings have higher betas than the average firm listed in the market. The results are quite robust to different ways of measuring beta and financial development, and to different ways of aggregating firms into industries. Results are also robust to controlling for economic development and industrial composition, and to sample selection issues, as well as to other factors. Alternative explanations related to country and industry characteristics do not explain the results away.

Our findings are consistent with rational listing decisions in a standard CAPM-pricing context, where the listing decision depends upon the trade-off between diversification (Pagano, 1993; Benninga, Helmantel, and Sarig, 2005; Pastor, Taylor, and Veronesi, 2009) and private benefits of control (Dyck and Zingales, 2004). Alternatives factors related to the value of a firm (e.g., size, growth opportunities, etc.) are also consistent with our findings.

Our paper brings three strands of literature together: financial development, composition of stock markets, and listing decisions. Regarding the first, it has been well documented that the development of financial markets varies widely across countries and in time (Goldsmith, 1973; King and Levine, 1993a; King and Levine, 1993b; Rajan and Zingales, 2003). The cross-sectional

determinants of this variation are relatively well understood, and have been mapped to the protection of creditors and investors, and the quality of the available information (La Porta et al., 1997; La Porta et al., 1998; Rajan and Zingales, 1998). However, the time series determinants have been far less researched (although see Rajan and Zingales, 2003; Braun and Raddatz, 2007). As for the mechanisms through which financial markets develop, the literature has even less to say. This paper contributes most to these two issues by proposing a plausible mechanism through which stock markets may develop in time. The story is theoretically plausible and has strong empirical content. A good knowledge of the mechanics is particularly relevant when designing policies to foster financial development.

The industrial composition of listed companies also varies across countries, and some less developed exchanges exhibit high concentration. These differences in composition are important, for instance, when interpreting and explaining the properties of country index returns (see, among others, Lesser, 1974; Roll, 1992; Heston and Rouwenhorst, 1994), or when exploring the benefits of global diversification as in Griffin and Karolyi (1998). This paper adds to this literature by showing that both the degree of concentration and the composition vary systematically with the development of equity markets.

The IPO literature has made important advances in documenting the rationality of the listing decision (for a survey, see Ritter and Welch, 2002), and it has been extended to the cross-listing decision of emerging market firms and stock market liberalization (Chari and Henry, 2004; Martell and Stulz, 2003; Bekaert and Harvey, 2003). In theory, we now know that new listings may produce positive externalities because they increase risk sharing opportunities (Pagano, 1993), or because they provide the market with information about non-listed companies (Subrahmanyam and Titman, 1999). These effects are likely to be dependent on the composition

of the market. Empirically, there is indeed an effect of new listings on the relative prices of the firms already in the market (Shleifer, 1986; Braun and Larrain, 2009; Hsu et al., 2010). This paper provides a joint evolution of the industrial composition of the stock market that is consistent with rational listing choices, and that generates effects on the prices of other firms.

We also explore the consequences of these effects for the shape of the market at different stages of development. In this sense this paper is related to recent work by Chemmanur et al. (2010) and Boot et al. (2008) that shows how the incentives for listing are modified in time (the former), and across critical market characteristics such as liquidity and participation (the latter).

Of course the determinant for the listing decision we focus on here is not the only one. There is literature that tries to explain, at the micro level, what the determinants of the public decision to go public are. Among others, these may be related to asymmetric information and evaluation costs (Chemmanur and Fulghieri, 1999), competition and the revelation of confidential information (Bhattacharya and Ritter, 1983; Maksimovic and Pitchler, 2001), competition and innovation (Spiegel and Tookes, 2007), and productivity and fixed costs (Clementi, 2002). We look at some of these other determinants as alternative explanations for our results.

The remainder of the paper is organized as follows. Section 2 shows that the economic composition does not entirely explain the market composition of a country and the differences in composition between highly and less developed equity markets. Section 3 presents the data, our main results, and the robustness checks. Here we also contrast our results with alternative explanations existing in the present literature. Section 4 briefly concludes.

2. Stylized Facts

Equity markets are highly concentrated not only at the firm level but also at the industry level. If we group firms into 48 different industries, the largest industry accounts for one fifth of the number of firms and a third of the market capitalization in a typical country. Nearly half the number of firms and seventy percent of capitalization is concentrated in the top 4 industries.[1]

Table 1 shows that this concentration is not homogeneous across countries, but it is significantly higher in places where the equity market is less developed as measured by the ratio of listed firms to population (see Table A1 for sample countries and their characteristics). Whereas in Russia the top 4 industries concentrate 99% of market capitalization and an 85% of the number of firms, in the U.S. they account for only around 50% on each count. This is very much the case for each one of the eight different measures of concentration we looked at, and is not dependent on the particular way of splitting the countries. In some of these measures the cross-country variation is even bigger than that of the traditional proxies for financial development such as market capitalization or value traded over GDP.[2]

The pattern of concentration across countries also varies markedly. Banks, telecom and utility firms are over-represented in many countries when compared to industries such as personal services. But there is wide variation around the mean share of each industry. With respect to the average, highly developed markets have a much higher concentration of firms in industries with higher co-movement with the market. The fourth column of Table 2 shows how the share of firms in each of the 48 industries varies when comparing highly developed to less developed equity

[1] These numbers are based on firm-level accounting and market data for the year 2001 from the Worldscope dataset, and Fama-French's 48 industry aggregation as we describe below. Data are available for 56 countries.

[2] Although part of the concentration is mechanical (i.e., it is due to financial underdevelopment in the extreme cases), the observation persists when we focus on a subset of countries where all industries are represented.

markets (with the stars denoting the significance of a difference of means test). Industries are sorted by their "complete market beta", which we compute by regressing the monthly excess returns of each one against the "complete market" excess return in the U.S. in the January 1973 to December 2003 period. The series corresponds to the historical U.S. industry returns maintained by Ken French on his homepage.

It is apparent from the table that, relative to less developed markets, the share of low beta industries such as utilities, food, and telecoms is significantly lower in developed equity markets. On the other hand, relative to the average, high beta sectors such as transportation, machinery, and wholesale are much smaller in less developed markets. Figure 1 shows that the relation is a good description of the data. The slope is not only very significant (more than four times its standard error) but also of a large economic magnitude: the (absolute) deviation is on average 1.3 percentage points from an average share that is, of course, only slightly above 2%. This means that the typical low beta industry would be between three and four times larger in poorly developed markets when compared to more developed ones.

The pattern is not eliminated when one accounts for the variation in the industrial composition of the different economies. Table 3 shows the differences between the economic and market composition across countries with both little and highly developed equity markets. For this analysis we were able to gather comparable output and value added data for only 34 OECD countries, disaggregated into 17 industry groups, from the OECD website. Although most of these countries are rich, we are still left with 13 financially underdeveloped markets when we apply the same definition of development as used above (see Table A1). We compare the share of revenue of listed firms to the share of output in the entire economy for each industry across the development groups (we get the same results when considering value added, not reported).

Lower-than-median-beta industries are overrepresented in all equity markets relative to their share in the economy. The magnitudes are quite large: whereas these account for little more than one third of economic output, their share in the equity market is twice as large in the typical country. What is also clear, though, is that the overrepresentation of low beta industries is much bigger in less developed equity markets (79% in the market vs. 39% in the economy) vis-à-vis more developed ones (60% vs. 34%). The last column in the table shows that all but one of the higher-than-median-beta-industries is relatively over-represented in well developed markets when compared to underdeveloped stock exchanges. Differences in the composition of production are much smaller across countries than those found in stock markets: the mean absolute difference of 3% in stock markets is 1.8 times larger than that of the economy. In this sense, variation in production has little hope of explaining all the variation in stock market composition, simply because it is too small. The composition of a country's economy, then, is important but large differences seem to persist in the representation of low and high beta industries across equity markets sorted by their degree of development. We return to this issue below.

There is much more to a market than its size relative to the economy. Industrial composition appears to change in a systematic way across countries, with high beta industries being particularly underrepresented in less developed markets.

2.1 Theoretical underpinnings

Our empirical finding that low beta firms tend to go public first is indeed consistent with rational listing decisions in a standard CAPM-pricing context, in a world where listing decisions depend upon the trade-off between diversification (Pagano, 1993; Benninga, Helmantel, and

Sarig, 2005; Pastor, Taylor, and Veronesi, 2009) and private benefits of control (Dyck and Zingales, 2004).

The intuition follows from the simple observation that as the act of going public involves — from the point of view of the entrepreneur who owns the firm— surrending at least part of the benefits of private control, in exchange for a piece of a well diversified stock market and the risk free asset. In this context, the entrepreneurs having low beta firms will be the ones more willing to go public, because their projects generate the higher gains from trade. This statement can indeed be formalized using a static CAPM model.[3]

3. Empirical Results

3.1 Data and the Empirical Approach

We explore the hypothesis that markets develop or complete starting with less cyclical firms and add increasingly risky ones by exploiting cross-country differences in the industrial composition and development of equity markets. We complement these results by comparing the characteristics of new share issues to those of the firms already listed.

The most direct implication of our hypothesis is that more cyclical firms will be listed in a more developed stock market. We could compute the market capitalization-weighted average beta of listed firms with respect to their own market. But this is of no use, of course, since it is always one by definition. That is, it is endogenous. We get around this problem by measuring betas using historical return data for the U.S. stock market over the last 30 years and by

[3] In particular, it can be shown that if low beta firms do not have relatively higher indyosincratic risk and size, compared to high beta firms —which is verified in our data at the industry level— the decision to go public is completely determined by the firm's beta. This is to say, beta is a sufficient statistic of the IPO decision. The formal result is available from the authors upon request. See also Casassus and Villalon (2010) for a dynamic model on the IPO decision showing similars results.

aggregating these into industries. The decision to use recent U.S. data is, of course, motivated by the fact that the U.S. is the largest and arguably the deepest and most developed equity market there is. It is also the one that has firms listed with the most varied characteristics, and in virtually every industry. For our purposes it is the market where one can convincingly argue that almost every firm that should be listed is listed. In other words, it is a market that is quite close to complete. We thus name the betas measured in that market as "complete market beta".

Firms in the U.S. may differ from those in other countries, and perhaps in systematic ways. Industries are likely to be more comparable in terms of the way they co-move with the economy, insofar as the manner in which demand and supply behave in the cycle is mainly of a technological nature. We believe that Ken French's benchmark 48-industry grouping captures in the broadest way possible the variation in the way returns behave, and we therefore take this as our starting point.

To estimate industry betas, we regressed the excess returns of each industry of the Fama French 48 industry classification (from January 1973 to December 2003) against the market excess return. During this period, the three major U.S. stock exchanges (NYSE, AMEX and NASDAQ) were included in the Fama French database, and all 48 industries had at least one listed firm in the market. The dataset also provides the average firm size and number of firms for each industry, which we later use for robustness.[4] These betas are reported in the first column of Table 2.

[4] When we use the Fama-French 17 industry classification we proceed in an identical way as with the 48 industry classification. The Fama-French database is also our source for the Fama-French three factor model data.

Based on the betas computed this way we calculate the industry-weighted country beta by using the share of each industry in that country. The weights come from Worldscope and are available for 56 countries in 2001. This dataset provides firm-specific data for listed firms, including balance sheets, end of year market capitalization, and standard industry classification (SIC) code. The SIC code allowed us to match the firms from Worldscope to their correspondent industry in the Fama French classification. Although Worldscope is the most comprehensive source for this kind of international data, it is not taken for granted that coverage is universal or similarly biased across countries. Since this may induce sample issues, we address this in the robustness section.

Our benchmark weighting scheme uses the number of firms. The advantage of using the number of firms weighted beta over market cap, revenues, or book asset betas stems from the fact that the number of firms in each industry in a given market does not depend on market prices, sales or accounting rules. Indeed, in our framework, relative prices do change in a systematic way as markets develop and the composition changes. This paper aims at documenting that the composition changes as cleanly as possible, leaving the pricing implications for future research. Using the number of firms to weight market betas is also less data intensive, which is important for assessing the situation for the least developed markets. As an alternative we also use market capitalization weights to avoid giving too much importance to firms that may be irrelevant in each market because of their small size. We call the latter "Firm Beta," and the former "Market Beta". We use other weighting schemes in the robustness section. The average complete market beta for each of the 56 countries is reported in column 3 of Table A1 (column 4 for the market cap-weighted version).

Our benchmark measure of market development is the log of the number of listed firms to total population (see the first column of Table A1).[5] This has been used before in the literature. Albeit not the most popular measure, it has the advantage, again, of being independent of prices, this time at their general level. As an alternative measure of development, we use the more popular market capitalization to GDP.

The way we proxy for the different concepts is far from perfect, but we believe the measures we construct have the advantage of being transparent, simple and easy to compute. We address some of the many shortcomings they have in the robustness section.

Our benchmark cross-country is of the following type:

$$\beta_j = a + b \cdot \log\left(\frac{\#\ of\ listed\ firms}{population}\right)_j + \varepsilon_j$$

where the industry-weighted country beta is constructed as

$$\beta_j = \sum_i^n \omega_{i,j} \cdot \beta_i$$

with $\omega_{i,j}$ being the weight of industry i in country j, defined as the number of listed firms in industry i over the total number of listed firms in the market, and β_i being the industry beta with respect to the complete market proxy, computed using the monthly returns in the U.S. from 1973 to 2003. We add to every specification per capita GDP to control for the level of economic (not financial) development.

Our prediction is that our estimate of b is positive and statistically significant, so that the average market beta increases with market development.

[5] The number of firms comes from Worldscope and Ken French's site, while population is taken from the World Development indicators.

3.2 Benchmark Results

Table 4 presents our basic results for the cross-country data. The estimate for the market development coefficient in column one is positive and highly significant: the industry-weighted country beta is strongly positively associated with market development. As can be seen in Figure 2, the relationship is robust and generally coincides with people's impressions about the depth, development, or completeness of most markets. The industry-weighted country beta in our sample is 1.01. That is approximately the figure for countries such as Spain, New Zealand and Australia. At one standard deviation (0.0752) above the mean we find countries such as Japan, Germany, and the UK, which could work as proxies of a complete market, whereas one standard deviation below the mean is represented by countries such as Argentina or Zimbabwe.

The effect is of economic importance. The industry-weighted country beta of the countries generally regarded as well developed is around 10% higher than in places such as Mexico, India, Egypt, and China. Considering that the range of industry betas goes only from 0.5 to 1.4 (with a standard deviation of 20%), this implies a large difference.[6] For instance, the five industries with the highest beta in well developed markets account for a share of 18% of the total, around three times as large as in the less developed ones (6.5%).

When we measure financial development with the more traditional market cap to GDP the coefficient turns out to be equally positive, significant, and of very much the same magnitude as before (in Table 7 we show that this is also the case for a number of other measures). Also, the relationship goes over and above the level of development of the particular country. GDP per

[6] The most common industries represented across all markets are financials and utilitites. We also tested what happened when we removed these industries from our sample. The relationship between market development and average industry complete-market beta remained unchanged. The coefficient was still positive (0.0281) and statistically significant at a 1% level.

capita enters positively, though it is not always significant, and reduces only marginally the main effect.

3.3 Further Evidence

We provide two more pieces of evidence that support the view that markets develop from low to high beta industries. We first look at a smaller sample of 39 countries for which we have data going back to 1991, and see what has been the evolution of their industry-weighted country beta. These data are of lesser quality, but we see no particular reason for them to be biased for or against industries sorted on their beta.

According to almost any measure, the 1990s were the period in which markets developed the most. Panel A in Table 5 shows that the average number of listed firms increased almost threefold from around four per million to more than eleven per million. Market capitalization to GDP increased from 35% to 78% in the same period. If our hypothesis is correct, one would expect to see average industry complete-market betas increasing rapidly. And this is exactly what we find: the industry-weighted country beta in the typical country grew about 5% in those ten years. And the economic magnitude is comparable to what we found before.[7] The difference is, again, very significant in statistical terms. Equity markets have not only been growing in size lately, but their composition has been changing rapidly towards higher beta sectors.

The second piece of confirming evidence comes from new stock issues. If our story is correct, we should expect to find that firms that list at any point in time tend to have a higher (complete market) industry beta than those that are already listed. Using IPO data from

[7] Based on the coefficients from the cross-country regression, and preliminary evidence from an exercise on the U.S. time-series for the period 1927-2003 (not reported), one would have expected an increase of between 2.5% and 6.3%, quite close to the actual number.

Thompson Financial's SDC Platinum for the entire 1990-2003 period,[8] we compute the average industry market betas of IPOs for 54 of the 56 countries in our sample.[9] The results show that the average beta of IPOs (1.0403) is much higher than the average beta of the firms already listed (1.0159). This difference is statistically significant as Panel B of Table 5 reports, and the effect is present in both developed and underdeveloped equity markets, although the effect is only significant within the former group. Finally, the fact that IPO betas are lower in less developed markets than in more developed ones provides confirming evidence of our main finding, only this time from a different dataset.

3.4 Robustness

The relationship between market development and its composition does not depend on the detail of how we measure the different concepts. Here we look at alternative factors related to the value of the firm, different ways of weighting (complete market) industry betas to compute country aggregates, variations in the definition of industries, other ways of measuring industry-weighted country betas and equity market development, and we address potential sample issues. The main result is robust to all these changes to the benchmark specification.

First, we used measures of value different than beta. In particular, we explore growth opportunities and size.[10] In the case of the former, firms with high growth opportunities will ceteris paribus fetch a higher value in the market.[11] In our context one expects these to be the first to list. A number of low beta industries, such as utilities and food products, are likely to have higher growth opportunities at early stages of economic development when compared to their

[8]Henderson et al. (2006) present a comprehensive study of this dataset, including all types of equity issues and debt issues.
[9]There were no IPOs for Slovakia and Liechtenstein during that period.
[10] We thank an anonymous referee for pointing out these additional alternatives.
[11] This argument has already been explored in the IPO literature (Pagano, Panetta, and Zingales, 1998; Pagano, Panetta, and Zingales, 1996; Pastor and Veronesi, 2005; Pastor et al., 2009).

developed countries counterparts. This means that, in relative terms, the incentive for the entrepreneur to list a firm in this type of industries is particularly strong in less-developed markets. As this happens these industries are able to finance their expansion projects, whereas the other firms can wait for better market conditions.

To verify the empirical content of this hypothesis, we ran a regression using the industry-weighted market-to-book ratio as the dependent variable. The ratio is computed as the average figure in the less developed markets and is intended to measure growth opportunities available to the firms in those countries. This market-to-book ratio is still exogenous to each particular market and so the country aggregate depends just on the weights of each industry in that market. Our results show that it is indeed the case that high grow firms tend to go public first (Column one in Panel A of Table 6). This is consistent with our hypothesis that the structure of the market is linked to the going-public decision, this time being measured with this alternative metric.

Life cycle theories suggest that firm size could also explain the composition of equity markets because it matters for the best time to go public (see, for instance, Pagano et al., 1998; Chemmanur and Fulghieri, 1999). One would expect larger firms in less developed equity markets to be the first ones to reach the "listable size," and hence to see that larger firms go public first. Stretching our approach a little, we assume that firm-level variation in size within industries is small relative to cross-industry variation and compute average firm size in each sector using Ken French's data. Again, the results confirm our general hypothesis since we find the negative coefficient of market development on size we expected (Column two in Panel A of Table 6).

One potential issue with our results is that using the number of firms as weighting factor may be determinant. This is our preferred measure because it is cleaner in the sense of being less dependent on prices and accounting differences. Still, we computed country betas using weights based on market capitalization, revenues, and the book value of assets. These turned out to be highly correlated with our firm number-based measure and between each other (pair-wise correlations ranged from 0.61 to 0.94, all of them significant at levels well under 1%). They were also similarly strongly correlated to our measures of financial development. Columns one, two and three in Panel B of Table 6 show that when these replace our benchmark measure the results are very much unchanged. When aggregating into industries, the variation across countries in the share of each one is significantly larger than the variation within each country in average accounting and valuation metrics.

Our benchmark results are based on the Fama French 48 industry classification to compute industry betas because it was the most disaggregated. Here we check that the relationship between market development and industry-weighted country beta is still present if we use an alternative industrial classification to compute industry betas. Using 48 industries allows us to capture more of the diversity in each country. For example, in the Fama French 17 industry classification, industry 16 is Banks, Insurance Companies, and Other Financials, and has a complete market beta of 1.003. Under the 48 industry classification that same industry is disaggregated into four different industries; Banking (beta 1.032), Insurance (beta 0.852), Real Estate (beta 1.029) and Trading (beta 0.998). The industry of Banks, Insurance Companies, and Other Financials is represented in 98% of the countries in our sample. When we break this industry into the four finer categories, only 54% of the countries have at least one listed firm in all industries of the group. A less disaggregated industry definition emphasizes continuous variation in size across industries in the identification of the effect. A more detailed classification

focuses more on the discrete difference between having some versus having no firms in the industry. We explore both sources of identification in turn.

Using this new 17-industry classification we are still able to capture the relationship between stock market development and average industry complete-market beta. Column four in Panel B of Table 6 shows that the coefficient of interest is still positive, statistically significant, and that it remains within the same order of magnitude as our benchmark results.

At the other extreme, we computed country betas using a dummy variable that takes a value of one if the industry is represented by at least one firm, and zero if no firm from the industry is listed. This means that, if you look only at the industries that are represented in a market, we are asking whether industry-dummy-weighted country betas increase with development. The coefficient is still very significant statistically, but accounts for around half the economic effect we found before (column five in Panel B). This means that identification stems from both the discrete and the continuous character of the data. The bulk of the identification, then, does not stem from the mere fact that some industries are simply not represented at all in less developed markets.

The CAPM states that returns come only from differences in industry betas. We know that other factors different from beta —such as size and value— have empirical value on their own. We could be mistaking betas with those other factors. We do not see this as particularly damaging since, under a broader interpretation of our hypothesis, these other sources of risk also determine value, the IPO decision and therefore the way the composition of the market evolves. In any case, we compute a multifactor market beta using Fama and French (1992)'s three factor specification, and use these conditional betas to measure average industry complete-market betas

across countries. The results are in the sixth column of Panel B in Table 6. Overall, we conclude that the details on how one measures systematic risk are not material for the findings.

The results of our benchmark cross country regression use the Worldscope database to compute the weights. Although this is the most comprehensive international firm-level dataset available, there is no assurance that coverage is complete. Coverage might be particularly biased against some type of firms (the smaller ones, perhaps), in particular in some countries (the less developed). If size is negatively correlated with industry-weighted country beta, this poses a potentially important sample issue. By concentrating only on those industries that are represented we can ease somewhat ease this concern. Here we address the issue more directly.

The World Bank's WDI database includes a variable that states the number of listed firms in different countries, and a variable that measures total market capitalization. These are the figures most commonly used in much of the financial development literature. Based on these figures, we have a mean (median) coverage of 75% (66%) in the number of firms, and 98% (93%) in market capitalization across countries. The WDI sample is not complete either, as we have more firms in one out of ten countries, and higher market capitalization in about a quarter of them. Still, we think it is a valid reference point to verify the completeness of our Worldscope sample.

We reran our benchmark regression in restricted samples thought to capture the completeness of our data. Even after imposing coverage of at least 75% of the firms or market capitalization —that is, little over half the sample— the coefficient for equity market development was still positive and highly significant (Panel C in Table 6). The magnitude changed but mostly remained the same order of magnitude as before.

The results are also robust to specific listed industries. For instance, all of the countries in our sample have at least one utilities firm listed in its stock market and, as mentioned above, 98% of the countries in the sample have at least one financials industry listed firm. Since utilities and financials are low and median beta industries respectively, these two sectors might be driving the results. In order to control for this fact, we reran our benchmark regression without any firms from the utilities or financials industry. The relationship between the average industry complete-market beta and market development continues after we remove all utilities and financials firms. The coefficient of interest remains within the same magnitude as in the benchmark specification (0.0281 with a standard error of 0.0042) and is still highly significant.

We defined the complete market as the U.S. market from 1973 to 2003. Our choice was influenced by the fact that the U.S. market is the one with most listed firms (see table A1 in the appendix), has representation in every Fama French industry, and has data on returns available from 1926. Still, one may be concerned about the robustness of our results using a different choice of the complete market benchmark. To this end we used monthly FTSE industry returns for 19 countries from January 1995 to December 2008.[12] We tested how similar industry betas are in countries that have all 10 FTSE sectors represented in their market in two ways. First, we ran a regression of country industry betas against the U.S. industry betas and a country dummy. The U.S. industry beta coefficient of the regression is positive (0.497) and significant at a 10% level. This result shows that industry betas in developed markets are similar. The second way to test how similar industry betas are among developed markets is by testing the rank correlation between country industry betas and the U.S. industry betas. The average rank correlation of the

[12] We used this period due to the availability of industry returns from FTSE.

countries with all industries represented is positive (0.473) and statistically significant at a 1% level.[13]

Since industry betas in developed markets are similar, using the U.S. or any other market that has representation of all industries would preserve our main finding that markets develop from low to high beta industries. Moreover, industry betas rank correlations show that low beta industries, such as utilities, are low beta in the U.K., Japan, or any other developed market. Using a different complete market proxy makes no difference, simply because betas are quite similar in all well developed stock markets.

Another concern that may arise is the specific period selected to define the complete market proxy (1973 to 2003). In this case, our choice was motivated by the fact the three major U.S. stock exchanges were included in the sample (NYSE, AMEX and NASDAQ). To test the relevance of this argument we estimated industry betas for the U.S. for three different sample periods and contrasted them with our benchmark results. Again, rank correlations were all high (from 0.61 to 0.98), positive, and statistically significant. This means that, at least in the U.S., empirically the rank of sectors based on beta does not change materially as the markets develop.

We also checked that our particular measures of equity market development —the number of listed firms to population and market capitalization to GDP— were not material to the results. Almost any size or activity-measure of equity market development works similarly well (stock market turnover, stock market value traded). Variables related to accounting quality and shareholder protection, thought to determine development, also enter positively and in a highly

[13] The average pair-wise rank correlation of the 45 countries with FTSE indexes is also positive (0.383) and statistically significant at a 1% level. This fact shows that even when not all industries are represented in the market, the ordinality of the industry betas is similar.

significant manner in the regression. In all these cases the economic magnitude is very similar. Legal origin and creditor rights enter with the expected sign but are typically not significant. Variables that proxy for bank development enter positively, but typically drop out when included together with stock market development measures (not reported).

3.5 Alternative Explanations

Country Characteristics

The first alternative explanation for our results is the one related to the industrial composition of production. That is to say, low industry-weighted beta countries are countries that tend to specialize in relatively low beta industries, and hence the observed stock market composition is simply a reflection of the underlying industrial composition. We have already shown that the composition of production does not vary nearly as much as that of stock markets and, therefore, cannot completely explain away our result. The effect was also shown to be robust to measures of general economic development, generally thought to be the cause of differences in production. Finally, the evidence regarding the way average industry complete-market betas have changed in the last ten years also argues against this being explained away with economic composition. Indeed, the change in the underlying composition of the economy would need to be implausibly rapid.

Here we address the issue more directly by computing industry-weighted country betas using the shares of sectors in the economy as weighting factor (i.e., 'economy betas') —as opposed to those in the stock market— and then running the benchmark regression controlling for this variable. Ideally one would compute country betas using for each of the 48 industries and all the countries in our sample. Unfortunately, these kinds of data are not widely available, especially at that level of industrial disaggregation. We were able, however, to gather economic composition

data for all the OECD countries (36 out of the 56) for 17 different sectors (see Table A1 for the countries and Table 3 for the industries included in this analysis). We then computed industry-weighted country betas by weighting the industry betas with both the country shares in total value added, and in total output.[14] The correlation between country betas using production and stock-market weighting factors is high (around 0.44) and statistically significant (at a 1% level), while that with per capita GDP is also positive, but smaller (0.25) and not significant.

Table 7 presents the results. We first check that after aggregating the 48 industries in 17 sectors, and reducing the sample to 34 countries there is still a positive association between industry-weighted country beta and market development (columns one and four). Once again, the result is very robust: the sign is positive, the coefficients as statistically significant as before, and of pretty much the same economic magnitude. The results below are likely not to be dependent on the way we aggregate industries, and the sample countries. The following columns add to the benchmark specification the country beta constructed by weighted the shares in value added ('economy value added beta') and the share in output ('economy output beta') as controls. As expected, the coefficients of the 'economy betas' are positive, although not always significant. There is indeed a positive association between economy betas and stock-market betas, but the link between the latter and economic development is not dependent on this. Our coefficient of interest is very much unchanged when we control for average industry complete-market economy betas. The results when using stock-market revenues and assets, and other measures of stock market development are virtually the same (not reported).

[14] We hand-matched the Fama French 48 industry classification to the classification used by the OECD. We used the arithmetic mean of the betas in the 48 industry classification to generate a proxy for the 17-sector betas.

Industry Characteristics

Firms and industries are different in a number of dimensions that could be correlated with their market beta. If these other characteristics somehow interact with stock market development (or any other strongly associated country variable) in the same direction as betas do, we could be capturing this, rather than our effect. To address this possibility, we gather a number of different industry characteristics using the industry information from the U.S. and weight them using the industry shares in each market to get a measure of the intensity of each characteristic. We consider external financing needs, asset tangibility, productivity, information available, financial integration, and idiosyncratic risk. All of these characteristics can be linked to alternative reasons for listing. The results are presented in Table 8.

As discussed by Rajan and Zingales (1998), dependence on external funds across different industries may prevent firms from more dependent industries from listing on the stock market, especially in less developed markets. We include in our benchmark regression a proxy of country external finance dependence, built using firm data for U.S. firms from 1996 to 2003. We do so by relying on the industry weighted average of Rajan and Zingales's measure for external finance dependence.[15] It is not the case that in our sample less developed equity markets exhibit significantly fewer firms in industries that require more external funding. Indeed, the correlation between development and this measure is slightly negative (though borderline insignificant). The variable is negatively related to industry-weighted country beta, and when included in the benchmark regression does not invalidate our main finding (column 1 in Table 8).

[15] Rajan and Zingales's measure of external finance dependence (RZ) for each firm is given by $RZ=(CAPEX-CASH\ FLOW)/CAPEX$.

Another possibility is that firms differ in terms of the tangibility of their assets, and protection for less tangible ones is poorer in less developed markets (Braun, 2003; Braun and Larrain, 2005). If this is so, one would expect firms with many intangible assets to have more difficulty in getting external funds, and so to be underrepresented in equity markets. Indeed, stock market tangibility is negatively correlated with both financial development and country beta. Yet, when included in the regressions, our main result is virtually unchanged (column 2 in Table 8). These results are also related to Spiegel and Tookes (2007)'s innovation argument if one accepts that lower tangibility is a proxy for high innovation since fixed assets are less important to generate innovation relative to intangible ones.

As proposed by Clementi (2002), industries with high total factor productivity (TFP) may have a higher likelihood of being listed in the stock market than the ones with a low TFP. The reason would be that, for these firms, operating at a scale smaller than the optimal would be particularly costly, and so would lead them to raise capital from the markets. Using the 2000-2005 average industry 4-factor TFP from the NBER, we include in our benchmark regression a proxy of each market's total factor productivity. Since TFP data is only available for manufacturing industries we focus on these in this test (column 3 in Table 8). More developed equity markets are indeed relatively more concentrated in industries with high TFP. But, again, country betas remain positively and significantly associated to stock market development. The coefficient is virtually the same as before.

Evaluation costs may also be important in the listing decision since higher costs would lead to a lower market price (Chemmanur and Fulghieri, 1999). In order to check that this is not behind our results we computed an analysts' coverage variable by counting the number of analysts that, according to Bloomberg, follow each firm in the U.S. and aggregating at the

industry level. Under the assumption that a higher number of analysts means a lower cost of evaluating a company, this variable is a proxy for these costs. When we include this variable in the regression, it does not enter significantly and has little effect on the country beta (column 4 in Table 8).

Another possible explanation is due to a higher economic and financial integration of developed countries. If more developed countries are more integrated, there may be the case that our results (higher correlation with the business cycle) are simply capturing this phenomenon. To address this issue we included in our basic specification the measure of equity market segmentation proposed by Bekaert et al. (2010). Consistent with theory, the measure of segmentation enters with a negative, and significant sign in the regression, yet our results remain virtually unchanged (column 5 in Table 8).

A final potential problem is that it may be diversifiable risk instead of market risk that we are picking in our variables. Brown and Kapadia (2008) show that firms with higher idiosyncratic risk have been listing in the U.S. at a time when, by most traditional measures, stock market was becoming more developed. In our sample, idiosyncratic risk is uncorrelated to both equity market development and country betas. When included in the benchmark regression it has no effect on the coefficient of interest (column 6 in Table 8).

In the end, a number of characteristics of firms (more precisely of industries) do matter significantly for the listing decision as (mostly) theoretical work has hypothesized —although not all of them necessarily in the same direction. More important, they appear to hamper the ability of firms to list differently across countries sorted on financial development. Tangibility and

productivity seem to be particularly relevant. Yet, none of them modify the size of the average industry complete-market beta coefficient.

Privatization

Megginson et al. (2004) present the idea that privatizations can spur financial market development in a country. Subrahmanyan and Titman (1999) support this idea and argue that a privatization through the stock market exposes costly information to investors that otherwise would have to pay for. This serendipitous information, as they call it, could encourage entrepreneurs to go public after the privatization has taken place, due to the new information available and the bigger base of informed investors.

Under our hypothesis that markets develop from low to high beta industries, privatization would encourage new firms to go public, and therefore help to develop the market, only if the privatization comes from a low beta industry. It may also be that less developed stock markets have a higher concentration of low beta industries simply because those countries begun privatizing utilities, telecoms, and other low-beta, regulated firms much later than rich countries.

To examine whether it is the latest privatization wave that drives our results we looked at the firms Megginson (2004) identifies as privatized in each country and computed their complete-market betas.[16] Indeed, telecommunications firms were the most commonly privatized firms through IPOs, and are one of the industries with the lowest betas. However, this turned out to be a common factor across countries and did not vary with the level of development in any significant way. The industry-weighted country beta using only the privatized firms had a small (0.1) and

[16] Megginson (2004) provides a list of firms that were privatized through an IPO for 59 countries from March 1961 to August 2003. Our Worldscope data contains 90% of those firms.

insignificant correlation with equity market development. This is mostly because the share of privatized firms in the total number or market cap is quite small (with a median of 1.6% across countries), and only weakly correlated to underdevelopment. We excluded privatized firms from both the measure of equity market development and when computing country betas and checked whether excluding these firms made any difference. It did not, as our coefficient of interest was virtually unchanged (see column 7 in Table 8).

4. Conclusion

We document a strong positive relationship between the level of equity market development and the country beta relative to a complete market benchmark. This relationship holds across countries and is not completely explained by the underlying composition of production. This relationship suggests that markets develop from low to high beta industries.

The results suggest at least two novel effects that we feel are worth testing and further exploring. First, they imply that expected relative returns (and relative market prices) do change (in predictable ways) with the state of development. Second, they point to the possibility that the decision to go public is perhaps not as simple as typically thought, but has important dynamic considerations.

Regarding financial development literature, we move from the critical issues of documenting that markets are differently developed and asking why this is so, to the issue of how they develop. Focusing on the mechanism, the paper contributes to complementing the policy implications suggested by the literature. Improving investor protection and diminishing informational asymmetries certainly helps but would not be enough to trigger development in the presence of a listing decision that is this elaborate. Furthermore, the inherent dynamic externality behind the

development process opens the doors to policy interventions that go well beyond providing the basic contracting and property rights institutions. Finally, our results also provide a new measure of stock market development that may be useful for future research in the area. We show that our measure is similarly correlated to other variables that are typically thought to proxy for the deep determinants of financial development. Unlike the traditional measures, however, this one is not based on the size of the market and is well-grounded on one (albeit particular) mechanism through which markets would develop.

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Tables

Table 1: Less developed Markets are more Concentrated

HH is the Herfindahl-Hirschman concentration index averaged out across countries in each development group. Max share is the weight of the industry with the highest share in the market averaged out across countries in each development group. C6 (C4) is the sum of the 6 (4) biggest industry shares in the country averaged out across countries in each development group. Firms means that industry weights were computed as the number of listed firms in each industry over each country's total. Market Cap means that weights were computed as the market cap in each industry over each country's total. Firms were classified using the Fama French 48 industry classification. Development groups were divided in high and low using the median of the ratio of number of firms to population as a cutoff rule. Significance (p-value): * 10%, ** 5%, *** 1%.

	Low Development	High Development	Difference
HH Firms	0.1343	0.0827	
Max Share of Firms	0.2189	0.1720	
C6 Firms	0.5915	0.5185	**
C4 Firms	0.4820	0.4155	*
HH Market Cap	0.2409	0.1752	*
Max Share of Market Cap	0.3642	0.2990	*
C6 Market Cap	0.8553	0.7282	***
C4 Market Cap	0.7607	0.6325	***

Table 2: Market Composition varies with development

The market share of each industry corresponds to the number of listed firms in each industry over each country's total averaged out across countries in each development group. Difference is the difference between High Development and Low Development. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Development groups were divided as high and low using the median of the ratio of number of firms to population as a cutoff rule. Significance (p-value): * 10%, ** 5%, *** 1%.

Fama French Industry	Industry Beta	Low Development	High Development	Difference	
Utilities	0.5088	0.0577	0.019	-0.0388	***
Food Products	0.6828	0.0375	0.0231	-0.0143	**
Tobacco Products	0.7092	0.0082	0.001	-0.0072	**
Beer & Liquor	0.7308	0.0136	0.0082	-0.0054	*
Precious Metals	0.7504	0.0087	0.0114	0.0027	
Petroleum and Natural Gas	0.762	0.0247	0.017	-0.0077	
Candy & Soda	0.8082	0.0125	0.0055	-0.007	*
Communication	0.8204	0.0374	0.0265	-0.0109	
Defense	0.8217	0.0012	0.0004	-0.0008	
Shipping Containers	0.8286	0.0054	0.0048	-0.0006	
Pharmaceutical Products	0.8375	0.0184	0.0166	-0.0018	
Insurance	0.8518	0.0526	0.0281	-0.0245	
Agriculture	0.8815	0.0187	0.0084	-0.0103	*
Medical Equipment	0.8953	0.0008	0.008	0.0071	***
Consumer Goods	0.9044	0.0161	0.0134	-0.0027	
Shipbuilding, Railroad Equipment	0.9383	0.0024	0.0015	-0.0009	
Textiles	0.9475	0.0376	0.0148	-0.0228	***
Fabricated Products	0.9641	0.0026	0.0037	0.0011	
Chemicals	0.9789	0.0359	0.0165	-0.0193	***
Non-Metallic and Industrial Metal Mining	0.9799	0.0187	0.0139	-0.0048	
Printing and Publishing	0.9802	0.0071	0.0119	0.0048	*
Business Supplies	0.9815	0.0128	0.0133	0.0005	
Coal	0.9832	0.0061	0.0007	-0.0054	*
Automobiles and Trucks	0.988	0.0227	0.0149	-0.0077	*
Trading	0.9984	0.0401	0.0743	0.0343	***
Real Estate	1.0293	0.0271	0.0447	0.0177	**
Banking	1.0322	0.1413	0.0718	-0.0694	**
Retail	1.0406	0.0336	0.04	0.0064	
Rubber and Plastic Products	1.0477	0.009	0.0085	-0.0005	
Miscellaneous	1.049	0.0037	0.0033	-0.0005	
Transportation	1.0494	0.0209	0.0355	0.0146	**
Construction Materials	1.05	0.0512	0.0335	-0.0177	**
Apparel	1.0685	0.0098	0.0085	-0.0013	
Wholesale	1.0776	0.0405	0.0647	0.0242	***
Personal Services	1.0808	0.0016	0.0047	0.0031	***
Aircraft	1.0829	0.0001	0.0019	0.0018	***
Steel Works Etc	1.0925	0.036	0.0206	-0.0153	**
Restaraunts, Hotels, Motels	1.1018	0.0206	0.0162	-0.0044	
Healthcare	1.1314	0.0037	0.0064	0.0028	
Machinery	1.1681	0.0184	0.0407	0.0223	**
Computers	1.1772	0.0051	0.0326	0.0275	***
Entertainment	1.2036	0.0055	0.0146	0.009	***
Electrical Equipment	1.2393	0.0069	0.0122	0.0053	**
Construction	1.2533	0.0238	0.0312	0.0074	
Business Services	1.392	0.0335	0.095	0.0615	***
Recreation	1.4337	0.0013	0.0069	0.0056	***
Electronic Equipment	1.446	0.006	0.0406	0.0346	***
Measuring and Control Equipment	1.4516	0.0008	0.0088	0.008	***
N		28	28		

Table 3: Share of Listed Companies Revenues vs Share of Economic Output by Development

Share of Revenues corresponds to the total revenues of listed firms in each industry over each country's total averaged out across the countries in each development group. Share of Output is each industry's share in total output in the entire economy. The share of output is rebased so that the total in each country adds up to 100%. Industry beta is computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Significance (p-value): * 10%, ** 5%, *** 1%.

		Low Development			High Development					
Sector	Industry Beta	Listed Firms Share of Revenue	Economy Share of Output	Difference	Listed Firms Share of Revenue	Economy Share of Output	Difference		Diff in Diff	
Utilities	0.509	0.1240	0.0332	0.091	0.0319	0.0218	0.010		0.081	**
Food & Beverages	0.741	0.0249	0.0639	-0.039	0.0427	0.0462	-0.004	***	-0.035	***
Mining	0.869	0.2186	0.0202	0.198	0.0651	0.0183	0.047	*	0.152	***
Agriculture	0.881	0.0082	0.0663	-0.058	0.0029	0.0285	-0.026	***	-0.032	***
Products & Goods	0.909	0.0924	0.0711	0.021	0.1075	0.0505	0.057		-0.036	
Transport, storage and communication	0.935	0.0961	0.0688	0.027	0.0997	0.0752	0.024	*	0.003	
Finance and insurance	0.961	0.2081	0.0383	0.170	0.2275	0.0662	0.161	***	0.008	
Chemicals	0.979	0.0193	0.0303	-0.011	0.0180	0.0301	-0.012	***	0.001	
Wood, Furniture and Paper	0.981	0.0147	0.0290	-0.014	0.0294	0.0360	-0.007	**	-0.008	
Textiles & Apparel	1.008	0.0109	0.0355	-0.025	0.0064	0.0127	-0.006	***	-0.018	***
Real estate	1.029	0.0029	0.0385	-0.036	0.0052	0.0661	-0.061	***	0.025	***
Wholesale and retail trade, restaurants	1.073	0.0803	0.1344	-0.054	0.1235	0.1260	-0.003	***	-0.052	
Steel Works	1.092	0.0439	0.0241	0.020	0.0554	0.0169	0.038		-0.019	
Machinery & Equipment	1.118	0.0199	0.1086	-0.089	0.1077	0.1063	0.001	**	-0.090	***
Education, health, social work and other	1.180	0.0045	0.1513	-0.147	0.0147	0.2105	-0.196	***	0.049	***
Construction	1.253	0.0206	0.0789	-0.058	0.0258	0.0683	-0.043	***	-0.016	
Renting and Business Services	1.392	0.0108	0.0076	0.003	0.0366	0.0204	0.016		-0.013	
Observations		13	13		21	21				

Table 4: Cross Country Betas Regressions

The dependent variable (Firms Beta) is the country's firm weighted average industry complete-market beta. Ln (# Firms / Pop) is our benchmark proxy for market development, Market Cap to GDP is an alternative market development measure and Ln (GDP pc) PPP, the log of the country's gross domestic product per capita at power purchasing parity, is used as a control for the country's economic development. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Robust standard errors. Significance (p-value): * 10%, ** 5%, *** 1%.

	(1)	(2)	(3)	(4)
	Firms Beta	Firms Beta	Firms Beta	Firms Beta
Ln (# Firms / Pop)	0.0222***		0.0200*	
	(0.00515)		(0.01031)	
Market Cap to GDP		0.0568***		0.0350**
		(0.01475)		(0.01411)
Ln (GDP pc) PPP			0.0053	0.0303***
			(0.01674)	(0.00849)
Constant	1.1806***	0.8811***	1.1055***	0.6143***
	(0.06061)	-0.01267	(0.26778)	(0.07364)
Observations	56	54	56	54
R-squared	0.333	0.239	0.334	0.333

Table 5: Further Evidence

Ln (# Firms / Pop) is the average logarithm of the total number of firms divided by population of each country. Market Cap / GDP is the average total market capitalization over GDP, Firms Beta is the firm weighted average industry complete-market beta and Market Cap Beta is the market cap weighted average industry complete-market beta of all countries that had at least 10 listed firms in the market on the Worldscope database on 1991. IPO Beta is the firm weighted average industry complete-market beta of all the IPOs in countries that had at least one IPO from 1990 to 2003 of the from the Thompson Financial's SDS Platinum database. Benchmark beta is the firm weighted average industry complete-market beta of listed firms for 2001. Complete sample refers to the 54 countries that had at least one IPO from 1990 to 2003. Development groups were divided as high and low using the median of the ratio of number of firms to population as a cutoff rule. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Robust standard errors. Significance (p-value): * 10%, ** 5%, *** 1%.

Panel A. Markets are Developing

	1991	2001	
Ln (# Firms / Pop)	-12.442	-11.402	***
Market Cap / GDP	0.3503	0.7815	***
Firms Beta	0.9967	1.0392	***
Market Cap Beta	0.9537	0.9766	**

Panel B. IPO Betas are higher than Market Betas

	IPO Beta	Market Beta	
Complete Sample	1.0403	1.0159	**
Low Development	0.9854	0.9689	
High Development	1.0952	1.0628	***

Table 6: Robustness

Firm weighted size is the industry-weighted average firm size in each country. Firm weighted market-to-book is the industry-weighted country average market-to-book ratio in countries with low market development. Market cap beta, revenues beta and book assets beta are the country's market cap, revenues and book assets weighted average industry complete-market beta. FF17 industry aggregation is the country's firm weighted average industry complete-market beta using the Fama French 17 industry classification. Dummy weighted beta is the country's average industry complete-market beta where industry weights are computed as one if there is at least one listed firm in the industry and zero otherwise. Multifactor firms beta is the country's firm weighted average industry complete-market beta where the industry beta corresponds to the market beta of the Fama French (1992) three factor model. Firms beta 25% firms, 50% firms and 75% firms are the country's firm weighted average industry complete-market beta where the total number of firms of each country in the Worldscope database is at least 25%, 50% and 75% of the total number of firms of the WDI sample respectively. Firms beta 25% market cap, 50% market cap and 75% market cap are the country's firm weighted average industry complete-market beta where the total market capitalization of each country in the Worldscope database is at least 25%, 50% and 75% of the total market capitalization of the WDI sample respectively. Ln (# Firms / Pop) is our benchmark proxy for market development. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Robust standard errors. Significance (p-value): * 10%, ** 5%, *** 1%.

Panel A. Cross Country - Other Measures of Value

	(1) Firm Weighted Market-to-Book	(2) Firm Weighted Size
Ln (# Firms / Pop)	-0.03257**	-48.1480***
	(0.017008)	(14.88536)
Constant	0.3034	190.1228
	(0.19079)	(165.93616)
Observations	56	56
R-squared	0.055	0.264

Panel B. Cross Country - Weighting, Industry Aggregation, Industry Beta

	(1) Market Cap Beta	(2) Revenues Beta	(3) Book Assets Beta	(4) FF17 Industry Aggregation	(5) Dummy Weighted Beta	(6) Multifactor Firms Beta
Ln (# Firms / Pop)	0.0325***	0.0318***	0.0190***	0.0139***	0.0129***	0.00847**
	(0.00697)	(0.00460)	(0.00424)	(0.00347)	(0.00265)	(0.00331)
Constant	1.334***	1.338***	1.202***	1.170***	1.146***	1.184***
	(0.0833)	(0.0550)	(0.0508)	(0.0415)	(0.0317)	(0.0396)
Observations	56	56	56	56	56	56
R-squared	0.287	0.470	0.272	0.228	0.305	0.108

Panel C. Cross Country - Sample

	(1) Firms Beta 25% Firms	(2) Firms Beta 50% Firms	(3) Firms Beta 75% Firms	(4) Firms Beta 25% Market Cap	(5) Firms Beta 50% Market Cap	(6) Firms Beta 75% Market Cap
Ln (# Firms / Pop)	0.0209***	0.0184***	0.0124*	0.0227***	0.0261***	0.0266***
	(0.00533)	(0.00550)	(0.00622)	-0.0046	-0.00496	-0.00545
Constant	1.1679***	1.1435***	1.0910***	1.1869***	1.224***	1.2294***
	(0.0604)	(0.0613)	(0.0671)	(0.0534)	(0.0578)	-0.0627
Observations	43	39	30	53	50	46
R-squared	0.274	0.231	0.126	0.323	0.368	0.351

Table 7: Controlling for the Composition of Production

Firms-beta, Market-cap-beta, Economy-value-added-beta, Economy-output-beta, and Sector-beta are the betas constructed by using the number of firms, market capitalization, value-added, output and the 48 Fama-French industry average beta that belong to a single sector, respectively, as the weight of the corresponding country-industry beta. Ln (# Firms / Pop) is our benchmark proxy for market development. Industry betas were computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. during January 1973 to December 2003. Robust standar errors. Significance (p-value): * 10%, ** 5%, *** 1%.

	Firms Beta			Market Cap Beta		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (# Firms / Pop)	0.0215***	0.0193***	0.0198***	0.022**	0.021**	0.021**
	(0.008)	(0.006)	(0.006)	(0.009)	(0.009)	(0.009)
Economy Value Added Beta		0.0533**			0.014	
		(0.020)			(0.023)	
Economy Output Beta			0.0576***			0.014
			(0.021)			(0.023)
Constant	1.163***	1.0430***	1.144***	1.191***	1.161***	1.162***
	(0.089)	(0.076)	(0.071)	(0.103)	(0.100)	(0.100)
Observations	34	34	34	34	34	34
R-squared	0.320	0.444	0.466	0.283	0.290	0.291

Table 8: Alternative Explanations

Firms beta is the country's firm weighted average industry complete-market beta. Ln (# Firms / Pop) is our benchmark proxy for market development. External finance dependence is the country's firm weighted Rajan and Zingales measure of external financial dependence. Asset tangibility is the country's firm weighted ratio of fixed assets to total assets in each industry. Manufacturing Beta is the country's firm weighted beta of the manufacturing industry firms only. Total Factor Productivity is the country's firm weighted 4-factor TFP of manufacturing industry firms. Analyst Coverage is the country's firm weighted number of analysts that follow a firm in each industry. Idiosyncratic risk is the firm weighted average of industry idiosyncratic risk. Ln (# Firms / Pop) w/out privatized is our benchmark poxy for market development without counting firms that were listed as a government privatization. Firms beta w/out privatized is the country's firms weighted average industry complete-market beta without including firms that were listed as a government privatization. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Robust standard errors. Significance (p-value): * 10%, ** 5%, *** 1%.

	(1) Firms Beta	(2) Firms Beta	(3) Manufacturing Beta	(4) Firms Beta	(5) Firms Beta	(6) Firms Beta	(7) Firms Beta w/out Privatized
Ln (# Firms / Pop)	0.0202***	0.0203***	0.0221***	0.0222***	0.0212***	0.0186***	
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	
External Finance Dependence	-0.116*						
	(0.063)						
Asset tangibility		-0.233					
		(0.234)					
Total Factor Productivity			0.161***				
			(0.036)				
Analyst Coverage				-0.018			
				(0.013)			
Segmentation					-0.0589		
					(0.045)		
Idiosyncratic Risk						-1.306*	
						(0.6640)	
Ln (# Firms / Pop) w/out Privatized							0.0220***
							-0.0051
Constant	-0.0586	1.224***	1.018***	1.215***	1.315***	1.190***	1.181***
	(0.685)	(0.075)	(0.101)	(0.063)	(0.114)	(0.056)	(0.060)
Observations	56	56	55	56	56	42	56
R-squared	0.384	0.382	0.678	0.341	0.370	0.442	0.329

Table A.1 - Data Description

The table shows the list of the 56 countries with different measures of market develoment. Ln(firms/pop) is our benchmark measures of market development. Market cap to gdp is an alternative measure of market development. Firms beta is the country's firms weighted beta. Market cap beta is the country's market cap weighted beta. Num firms is the country's number of listed firs in 2001. Development groups were divided as high (0) and low (1) using the median Ln (number of firms / population) as a cutoff rule. OECD is one (1) if the country has an OECD report an zero (0) otherwise. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. in the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification.

Country	Ln (firms/pop)	Mkt. Cap to GDP	Firms Beta	Mkt. Cap Beta	Num Firms	Low Development	OECD sample
Argentina	-13.1131	0.7910	0.8590	0.8493	73	1	0
Australia	-9.6627	0.8665	0.9199	0.9742	1235	0	1
Austria	-11.1115	0.1236	0.9483	0.9179	120	0	1
Barbados	-12.4987	0.5455	0.7706	0.8373	1	1	0
Belgium	-11.1160	0.6491	0.9490	0.9384	153	0	1
Bermuda	-7.7551		0.8974	1.2229	27	0	0
Brazil	-13.1907	0.2759	0.8699	0.8535	322	1	1
Canada	-10.2842	0.9504	0.9105	0.9765	1062	0	1
Chile	-11.4025	0.7456	0.8307	0.8476	172	0	0
China	-15.3078	0.4976	0.9427	0.9247	286	1	1
Colombia	-14.2452	0.0730	0.8925	0.9025	28	1	0
Czech Republic	-12.4026	0.1395	0.7691	0.7857	42	1	1
Denmark	-10.1713	0.5367	0.9588	0.9570	205	0	1
Egypt	-15.3536	0.2836	0.8805	0.9334	14	1	0
Finland	-10.4647	1.7159	1.0119	1.2659	148	0	1
France	-11.1243	0.8565	0.9935	0.9307	873	0	1
Germany	-11.4128	0.5429	0.9901	0.9361	910	0	1
Greece	-10.4818	0.7211	0.9386	0.9672	297	0	1
Hong Kong	-9.0569	2.9863	0.9799	0.9405	784	0	0
Hungary	-12.4477	0.1131	0.8166	0.8277	40	1	1
India	-14.8775	0.2081	0.9104	0.9826	357	1	1
Indonesia	-13.4407	0.0770	0.9040	0.9107	304	1	1
Ireland	-10.9931	0.6510	0.9448	0.9933	65	0	1
Israel	-10.8337	0.5298	1.0188	1.0642	127	0	0
Italy	-12.2432	0.5097	0.9347	0.8677	278	1	1
Japan	-10.4946	0.5593	0.9900	1.0228	3517	0	1
Jordan	-13.2339	0.6372	0.8804	0.9936	9	1	0
Liechtenstein	-9.2904		0.9748	1.0647	3	0	0
Luxembourg	-9.5288	1.3351	0.8951	1.2670	32	0	1
Malaysia	-10.3520	1.3200	0.9475	0.9163	760	0	0
Mexico	-13.6353	0.0924	0.9022	0.8969	119	1	0
Morocco	-14.5496	0.2997	0.8731	0.9978	14	1	0
Netherlands	-11.1700	1.2377	0.9766	0.9376	226	0	1
New Zealand	-10.4442	0.3109	0.9180	0.9099	113	0	1
Norway	-10.1351	0.3451	0.9634	0.9188	179	0	1
Pakistan	-14.1040	0.0785	0.8407	0.8162	106	1	0
Peru	-12.7964	0.1632	0.8449	0.8503	73	1	0
Philippines	-12.8931	0.5063	0.8966	0.9609	197	1	0
Poland	-12.9372	0.0946	0.9317	0.9682	93	1	1
Portugal	-11.8570	0.4173	0.9521	0.9114	72	1	1
Republic of Korea	-11.0582	0.4253	0.9562	1.0277	746	0	1
Russian Federation	-15.2940	0.1585	0.7050	0.7045	33	1	1
Singapore	-9.1450	1.3505	1.0141	1.0198	441	0	0
Slovakia	-12.9331	0.0252	0.8277	0.8031	13	1	1
South Africa	-11.5199	1.3127	0.9503	0.9184	445	1	1
Spain	-12.3241	0.7150	0.9157	0.8825	181	1	1
Sri Lanka	-13.7500	0.0509	0.8702	0.8964	20	1	0
Sweden	-10.1690	1.1449	1.0329	1.0882	341	0	1
Switzerland	-10.1484	2.2772	0.9351	0.8908	283	0	1
Taiwan	-10.6947	0.8213	1.0287	1.1796	507	0	1
Thailand	-12.0715	0.2638	0.9052	0.9484	350	1	0
Turkey	-12.8953	0.0157	0.8890	0.9536	172	1	0
United Kingdom	-10.4799	1.4407	1.0110	0.9565	1659	0	1
United States of America	-10.4622	1.2290	1.0000	1.0000	8159	0	1
Venezuela	-13.5231	0.0102	0.8888	0.8636	33	1	0
Zimbabwe	-13.5963	0.4893	0.8693	0.9837	16	1	0
Mean	-11.83	0.64	0.92	0.95	479.20	0.50	0.61
Median	-11.47	0.52	0.92	0.94	172.00	0.50	1.00
Standard Deviation	1.77	0.59	0.07	0.11	1181.46	0.50	0.49
N	56	54	56	56	56	56	56

Figures

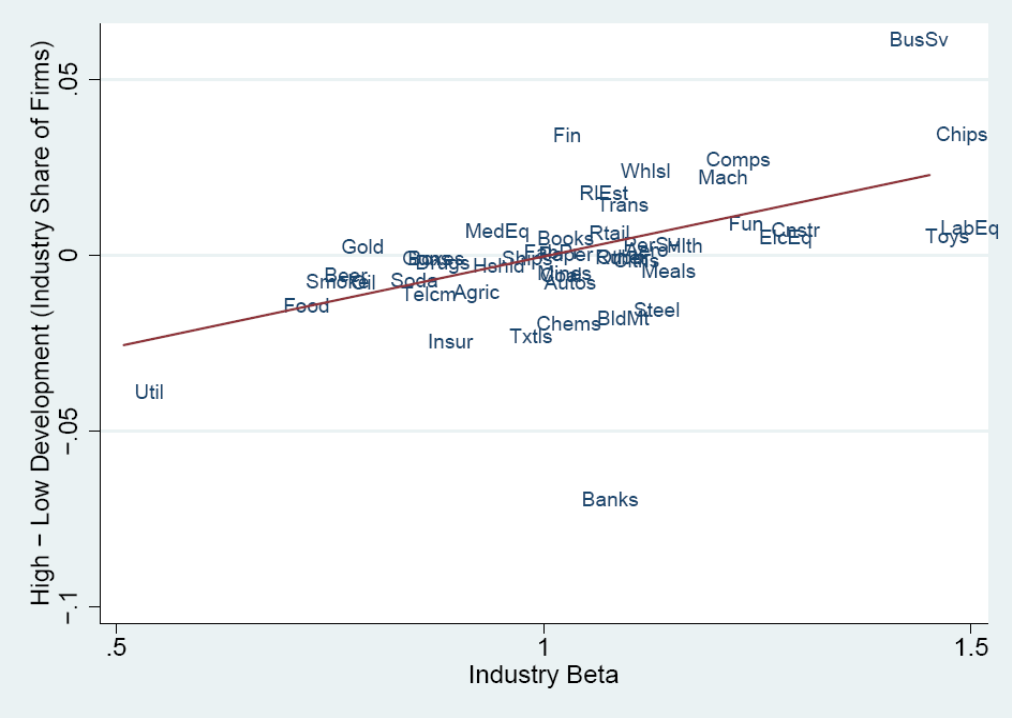

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Figure 1 – Market composition varies with the level of development

The graph shows the difference between the average market share of high developed equity markets minus low developed equity markets against complete market industry beta. The market share of each industry corresponds to the number of listed firms in each industry over each country's total, averaged out across countries in each development group. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. over the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification. Development groups were divided as high and low using the median Ln (number of firms / population) as a cutoff rule.

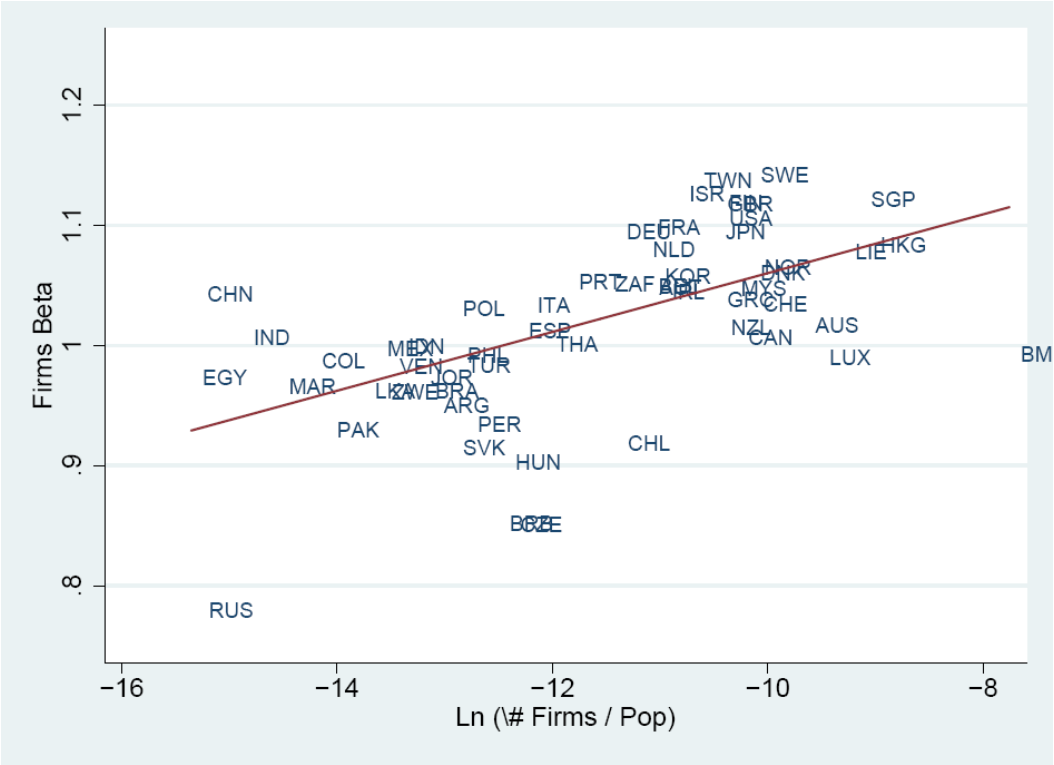

Figure 2 – Complete Market Betas increases with Market Development

The graph shows the country's firm weighted beta against Ln (# Firms / Pop) which is our benchmark proxy for market development. Industry betas are computed by regressing the monthly excess returns of each industry against the complete market excess return in the U.S. over the January 1973 to December 2003 period. Firms were classified using the Fama French 48 industry classification.