NBER WORKING PAPER SERIES

GLOBAL GROWTH OPPORTUNITIES AND MARKET INTEGRATION

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Working Paper 10990
http://www.nber.org/papers/w10990

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2004

We appreciate the helpful comments of Will Goetzmann, John Graham, and participants at the 2004 EFA meetings and the October 2004 Financial Market Integration lecture series at the ECB. Send correspondence to: Campbell R. Harvey, Fuqua School of Business, Duke University, Durham, NC 27708. Phone: +1 919.660.7768, E-mail: cam.harvey@duke.edu .

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NBER Working Paper No. 10990
December 2004
JEL No. F30, F36, G15, O11, O57

ABSTRACT

We measure a country's growth opportunities by investigating how its industry mix is priced in global capital markets, using price earnings ratios of global industry portfolios. We derive three sets of empirical results. First, these exogenous growth opportunities strongly predict future changes in real GDP and investment in a large panel of countries. This relation is strongest in countries that have liberalized their capital accounts, equity markets, and banking systems. Second, we re-examine the link between financial development, investor protection, capital allocation, and growth. We find that financial development and investor protection measures are much less important in aligning growth opportunities with growth than is capital market openness. Third, we formulate new tests of market integration and segmentation. Under integration, the difference between a country's local PE ratio and its global counterpart should not predict relative growth, but the difference between its "exogenous" global PE ratio and the world market PE ratio should predict relative growth.

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1 Introduction

In a perfectly integrated world economy, capital should be invested where it expects to earn the highest risk-adjusted return. Much of the research on real variables and quantities is strongly at odds with the notion of global integration. For example, in their classic study of 16 developed countries, Feldstein and Horioka (1980) found that domestic saving rates explain over 90% of the variation in investment rates. Because the Feldstein and Horioka sample ends in 1974, it does not reflect the considerable progress towards globalization in the 1970s and 1980s. However, Obstfeld and Rogoff (2000) continue to find a high correlation between domestic investment and savings for the 1990-97 period, both for the OECD countries and a group of mid-income emerging countries. Apart from a home bias in investment, research has documented a home bias in trade. Even controlling for tariffs, a country is much more likely to trade within its own borders than with neighboring countries.[1] There is also a well-documented home asset bias. Despite uncontroversial diversification benefits, there is a strong preference for investing in domestic securities.[2]

While the case for imperfect integration is strong when using real/quantity variables, it is more mixed when using prices and returns. For example, Harvey (1991) finds evidence that a global version of the CAPM cannot be rejected in the majority of developed country equity returns (with Japan as the exception). For emerging markets, Bekaert and Harvey (1995, 2000) provide sharper evidence against the hypothesis of global equity market integration.

While the welfare benefits from full integration may be large (see Lewis (1999)), the benefits of increasing globalization are being questioned.[3] We add a new perspective to the literature. Our research proposes a simple measure of country-specific growth opportunities based on two rather non-controversial assumptions. First, the growth potential of a country is the growth potential of its mix of industries. Second, price earnings (PE) ratios contain information about growth opportunities. If markets are globally integrated, we can measure

[1] See, for example, McCallum (1995) and Helliwell (1998).

[2] See, for example, French and Poterba (1991), Tesar and Werner (1995), Baxter and Jermann (1997), and Lewis (1999).

[3] See, for example, Rodrik (1998) and Stiglitz (2000).

a country's growth opportunities by investigating how its industry mix is priced in global capital markets using the price earnings ratios of global industry portfolios. This perspective potentially offers a number of useful economic insights.

First, for each country in the world, it permits the construction of an *exogenous* growth opportunity measure that does not use local price information. Such a measure should prove useful in numerous empirical studies seeking to avoid endogeneity problems. One example is the study by Bekaert, Harvey and Lundblad (2004), which examines the effect of equity market liberalization on growth. If countries liberalize when growth opportunities are abundant, regressions of future growth on a liberalization indicator suffer from a severe endogeneity problem. Measures of growth opportunities that use local price information are problematic because they may either reflect "exogenous" growth opportunities or better growth prospects induced by the liberalization decision. For the exogenous growth opportunity measure to be useful, it must actually predict growth. That is, countries that happen to have a high concentration of high PE industries should grow faster than average. We find that they do.

Second, our framework can be employed to shed new light on the link between financial development, capital allocation, and growth (see Levine (2004) for a survey). Research by Rajan and Zingales (1998), Wurgler (2000), LaPorta et al. (2000) stress the role of financial development in relaxing external financial constraints and improved investor protection as the critical growth channels. However, recent work by Fisman and Love (2003, 2004) suggests that financial development simply better aligns industry growth opportunities with actual growth. We test this hypothesis directly in a panel framework, in contrast to the purely cross-sectional approach followed in the existing literature. Moreover, the literature implicitly ignores the role of international capital flows. We also investigate how important financial openness is for aligning growth opportunities with growth. If financial liberalization is effective, countries that have liberalized their capital accounts, equity markets, or banking sectors, should display a closer association between growth opportunities and future real activity.

Third, our measure can be used in formal tests of market integration that bridge research on real quantities with price-based variables. When growth opportunities are competitively

priced and exploited in internationally integrated markets, PE's for firms in the same industry should be equalized (barring risk differences) across countries. Consequently, under the null of market integration, the difference between a country's industry weighted global PE ratio and the world market PE ratio should predict future real GDP growth relative to world growth. Conversely, the difference between a country's global and local PE ratio should not predict growth in excess of world growth. We also investigate how these integration tests depend on measured degrees of financial openness.

The remainder of the paper is organized as follows. Section two motivates our growth opportunities measure using a simple present value model, details its construction, its link with market integration, and provides some summary statistics. The third section checks whether our growth opportunity measure indeed predicts growth, contrasting the predictive performance of local with global measures. The fourth section formulates and conducts our test of market integration. Some concluding remarks are offered in the final section.

2 Measuring Growth Opportunities

2.1 *Growth opportunities, market integration, and economic growth*

Holding a number of factors constant, higher price earnings ratios indicate high growth opportunities. Investors are willing to pay a large multiple of today's earnings for the stock only if they believe that there will be a high rate of growth in the future. Of course, there are other determinants of the price to earnings ratio, such as risk.

Others have proposed different proxies for growth opportunities. The corporate finance literature often uses market to book value as a proxy for Tobin's Q and a measure of investment opportunities (see e.g. Smith and Watts (1992), Booth et al. (2001), and Allayannis et al. (2003)). Fisman and Love (2003) and Gupta and Yuan (2004) use historical sales growth of U.S. industries as a measure of growth opportunities. In contrast to sales growth, PE has the advantage of being forward looking.

In integrated world capital markets, growth opportunities are competitively priced. This implies that a country's PE ratio for a particular industry should not significantly differ from

its world counterpart. However, there are obviously different growth opportunities across industries. Hence, one source of local GDP growth relative to world GDP growth is the weighting of industries within a particular country. If a country has a large concentration in high PE (high growth opportunity) industries, then it should grow faster than the world.

To formalize this, we view each country as consisting of a set of industries that receive stochastic growth opportunities. Under full integration, all opportunities are competitively priced and exploited, so there is no country-specific growth opportunity for any industry. Let (logarithmic) earnings growth be denoted by $\Delta \ln(EA_t)$ and let countries and industries be indexed by i and j, respectively. Assume

$$\Delta \ln(EA_{i,j,t}) = GO_{w,j,t-1} + \epsilon_{i,j,t}, \tag{1}$$

where $GO_{w,j,t-1}$ represents the stochastic growth opportunity for each industry j which does not depend on the country to which the industry belongs. In contrast, $\epsilon_{i,j,t}$ is a country and industry specific earnings growth disturbance. The discount rate process for each industry ($\delta_{i,j,t}$) is an affine function of the world discount rate ($\delta_{w,t}$), as would be true in a financially integrated market.

$$\delta_{i,j,t} = r_f(1 - \beta_{i,j}) + \beta_{i,j}\delta_{w,t}, \tag{2}$$

where $\beta_{i,j}$ represented the exposure to systematic risk for industry j in country i. In addition, suppose that

$$\beta_{i,j} = \beta_j. \tag{3}$$

That is, industry systematic risk is the same across integrated countries. Of course, this assumption will not hold if there are leverage differences across countries.

For quite general dynamics for δ_w and $GO_{w,j}$, but with normally distributed shocks, Appendix A shows that it is possible to derive, in closed-form, the PE ratio as an infinite sum of exponentiated affine functions of the current realizations of the growth opportunity (with a positive sign) and the discount rate (with a negative sign).

While the resulting expression is unwieldy, it can be linearized to yield:

$$pe_{i,j,t} = \bar{a}_{i,j} + \bar{b}_{i,j}\delta_{w,t} + \bar{c}_j GO_{w,j,t} \tag{4}$$

where pe is the log PE ratio. Under full integration, $\bar{b}_{i,j} = \bar{b}_j$, and $\bar{c}_j$ does not depend on country i because of the assumption in (1). Why do certain countries grow faster than the average? In a fully integrated world, there are only two channels of growth for a particular country: luck (the error term) and an industry composition that differs from the world's. These assumptions also imply that industry PE ratios are similar across countries as they are determined primarily by global factors.[4]

Global industry PE ratios therefore contain the same information about industry growth opportunities in a given country as local PE ratios. As a consequence, as local and global industry PE ratios move together, the difference between them should contain no information about the country's future economic performance relative to the world economy. In contrast, this is not true when markets are not fully integrated and growth opportunities are not priced globally (but locally). That is, the link between our growth opportunities measures and future growth can lead to a test of market integration.

Let PE_i denote the vector of industry PE ratios in country i and PE_w the vector of world industry PE ratios. Similarly, define country and world industry weights by IW_i and IW_w, respectively. Combining these vectors for country i, we define local growth opportunities (LGO) and global growth opportunities (GGO):

$$LGO_{i,t} = ln[IW'_{i,t-1} PE_{i,t}] \tag{5}$$

$$GGO_{i,t} = ln[IW'_{i,t-1} PE_{w,t}]. \tag{6}$$

These definitions are summarized in Table 1. In integrated markets, LGO and GGO reflect the same information and should hence both predict economic growth in country i. Furthermore, the difference between the two measures, which we call local excess growth opportunities ($LEGO$), should be constant and should therefore have no predictive power for relative economic growth. If markets are not fully integrated, though, LGO and GGO will

[4]There is a country-specific intercept that comes from volatility terms and a potentially country-specific component to the discount rate, but the time variation in the PE ratio is driven by global factors. However, if there are systematic leverage differences across countries, PE ratios across countries will react differently to changes in global discount rates.

display different temporal behavior and $LEGO$ should predict economic growth in country i in excess of world economic growth. In other words, under our auxiliary assumptions, the hypothesis of no predictability constitutes a market integration hypothesis.

If, on the other hand, we start from the hypothesis that markets are completely segmented, we do not expect global industry PE ratios to contain information about local growth opportunities. Hence, GGO should not necessarily predict economic growth in country i. Moreover, let's define the difference between GGO and the log of the world market price earnings ratio (WGO) as:

$$GEGO_{i,t} = GGO_{i,t} - WGO_t \tag{7}$$

where

$$WGO_t = ln[IW'_{w,t-1} PE_{w,t}]. \tag{8}$$

Under the null of market segmentation, $GEGO$ should not predict relative growth in country i as global prices contain no information about exploitable growth opportunities. If the hypothesis of market segmentation is incorrect, $GEGO$ should predict economic growth in country i relative to world economic growth, because it reflects the difference between local and global industry composition. Under the above assumptions of market integration, this difference should be the only measure predicting relative growth. Predictive regressions of future relative economic growth onto $GEGO$ allow us therefore to also test the hypothesis of market segmentation. Table 1 summarizes the proposed measures of growth opportunities as well as their ability to predict economic growth under different assumptions.

2.2 *Constructing the growth opportunity measures*

We construct the measures of growth opportunities discussed above for a sample of 50 countries, listed in Appendix Table A1.

To construct LGO and WGO, we simply take natural logs of the country-specific or world market PE ratio. We use monthly PE ratios from Datastream as the primary source. A few countries in our sample are not covered by Datastream and we use PE ratios from the Standard & Poor's Emerging Markets Data Base (IFC) instead. For Italy, Norway, Spain,

and Sweden, we use PE ratios from MSCI to exploit the longer time series compared to Datastream.

For the construction of our exogenous measure of growth opportunities, GGO, we require global industry PE ratios as well as country-specific industry weights. We obtain global industry PE ratios for 35 industrial sectors with 101 sub-sectors from Datastream. We construct two alternative sets of country-specific industry weights; the first uses market capitalization and the second uses value added to construct relative weights. Most of the results in the paper are based on the market capitalization weights. As a robustness check, we present some results based on an alternative value-added weighting.[5] For 21 of our 50 countries, our measure simply uses the Datastream data to calculate the market capitalization of a country's industries relative to the country's total stock market capitalization for 35 industries. For the remaining 29 countries, we use the 82 industries used by the IFC to come up with an industry weight vector. The local weights for these 82 industries are matched with the Datastream price earning ratios by linking the 101 Datastream sub-sectors to the corresponding local market industry structure. Second, for our robustness exercise, we use value added data from the UNIDO Industrial Statistics Database which covers 28 manufacturing industries in a large number of countries. The weight of an industry in a given country is again determined by the industry-specific value added relative to the total value added by the manufacturing sector in that country. A similar matching process links the 28 manufacturing industries used by UNIDO to the Datastream price earnings ratios.[6] Appendix B provides much more detail about the construction of all measures of growth opportunities.

Our tests may have low power when discount rate changes dominate the variation of the PE ratios. Therefore, we create an alternative measure by removing a 60-month moving

[5] A full set of results based upon the value added weighting is available upon request.

[6] In a related application, Almeida and Wolfenzon (2004) use the UNIDO weights and world industry measures of external financing needs, to construct an exogenous measure of a country's external financing needs.

average from the standard measure. For example, we define LGO_MA as:

$$LGO\_MA_{i,t} = LGO_{i,t} - \frac{1}{60} \sum_{s=t-60}^{t-1} LGO_{i,s} \tag{9}$$

The relative measure is less likely to be dominated by discount rate changes, if discount rates are more persistent than growth opportunities, for which there is some empirical evidence. GGO_MA, $LEGO\_MA$, and $GEGO\_MA$ are calculated analogously.

While some of our growth opportunity measures are available at a monthly frequency from as early as January 1973 until December 2002, the starting points for measures using local PE ratios vary across the 50 countries and other macro variables are available only at an annual frequency. Therefore, we only use the December values of our growth opportunity measures from 1980 until 2002. In addition to the complete set of the 50 countries, we study the subset of 17 developed countries for which we are able to construct LGO and $LEGO$ for all years between 1980 and 2002. We also consider a subset of 30 emerging market countries for which the LGO and $LEGO$ time series are of varied length. Table 2 provides a summary of the construction of all the variables and the data sources.

2.3 *Comparing the growth opportunity measures*

Table 3 contains summary statistics for the growth opportunity measures used in Sections 3 and 4, where we will investigate the predictive content of the different growth opportunity measures with respect to GDP growth and investment growth.

Panel A presents summary statistics for our unadjusted growth opportunity measures, averaged over different country groups. The measure of local growth opportunities, LGO, is based on local PE ratios. Not surprisingly, it exhibits substantial time-series variation. It exhibits substantial cross-sectional variation as well. GGO, our measure of exogenous growth opportunities, show lower dispersion than LGO. When comparing the sample of developed countries to the emerging market sample, we find little difference in the means and standard deviations of LGO and GGO. $LEGO$, the industry-weighted difference between information contained in local and global PE ratios, is on average higher in developed countries (-0.208) than in emerging market countries (-0.494). Similarly, $GEGO$ has a

higher mean in the sample of developed countries (0.044 vs. 0.009), possibly reflecting a more favorable industrial composition in developed countries. The variability of $LEGO$ and $GEGO$ is lower in the sample of developed countries than in the sample of emerging market countries.

Panel B reports the same summary statistics for the adjusted growth measures, that is the original measures less a 60-month moving average. With the exception of LGO_MA, the same pattern as in Panel A emerges. LGO_MA appears to be lower and more volatile in emerging market countries compared to developed countries. Remember, though, that the availability of local PE ratios is limited for emerging countries, so that the summary statistics for measures of local growth opportunities are not directly comparable across the two samples.

Panel C presents correlations between the different unadjusted as well as adjusted measures of growth opportunities. In both cases, the correlation between LGO and WGO and LGO and GGO is substantially higher for developed countries than for emerging market countries. The correlation between GGO and WGO as well is high for all countries, confirming that changes in GGO are mainly driven by changes in the global PE ratios rather than by slowly evolving industry weights. While not reported, the correlation between our measure of exogenous growth opportunities and the alternative measure that uses value added weights is similarly high for all countries.

Given that developed countries should be more open than emerging countries, developed countries are also likely to have experienced increased international integration over the past 20 years. For the sample of developed countries, Figure 1 shows the evolution of the average absolute value of $LEGO$, i.e. the distance between LGO and GGO. While noisy, there appears to be a downward trend in the annual sample average, consistent with increasing market integration. Still using only observations from developed countries, we run a regression of the absolute value of $LEGO$ onto a (country-specific) constant and a time trend. We find a negative (-0.0076) and highly significant (standard error: 0.0018) trend coefficient, confirming a reduction in the distance between LGO and GGO for our sample of developed countries.

We expect local and global measures of growth opportunities to converge when countries become more integrated, but we have no such prior with respect to $GEGO$ (the difference between GGO and the log of the world price to earnings ratio (WGO)). Figure 2 shows that for developed as well as emerging market countries the absolute value of $GEGO$ seems to have decreased over time up until about 1998.

One potential explanation is that differences in industrial composition across countries have decreased over time. To explore this further, we measure the difference between a country's industrial composition and the world's industrial composition. For each developed country, we calculate the average absolute value of the differences between the country's industry weights and the world's industry weights for each year. Figure 3 shows that differences between local and world industrial composition have decreased over time. For some countries this process is more pronounced. For example, the industrial composition of the Austrian economy has moved substantially closer to the world's industrial composition. On the other hand, the relative industrial composition of the U.S. has changed little. Given its economic weight in the world economy, this is, of course, not surprising. Importantly, the graph shows that on average a country's industrial composition differs substantially from the world's industrial composition. Under the null of market integration, cross-sectional variation in this composition is the only factor that explains cross country growth differences.

3 Do Growth Opportunities Predict Growth?

3.1 *Econometric framework*

The first regressions we consider are

$$y_{i,t+k,k} = \alpha_{i,0} + \alpha_{i,1,t} LGO\_MA_{i,t} + \eta_{i,t+k,k} \tag{10}$$

$$y_{i,t+k,k} = \alpha_{i,0} + \alpha_{i,1,t} GGO\_MA_{i,t} + \eta_{i,t+k,k} \tag{11}$$

where $y_{i,t+k,k}$ is the k-year average growth rate of either real per capita gross domestic product or investment for country i. We run similar experiments using $LGO_{i,t}$ and $GGO_{i,t}$

as the regressors.[7] We follow the convention in the growth literature employing $k = 5$ to minimize the influence of higher frequency business cycles in our sample. We maximize the time-series content of our estimates by using overlapping five-year periods.

We include country specific fixed effects, $\alpha_{i,0}$, consistent with the model in Section 2, to capture cross-sectional heterogeneity and potentially omitted variables. Regressions (10) and (11) both test whether our growth opportunity measures indeed predict growth. However, the *GGO*-measure should only predict growth in integrated markets. Therefore, the slope coefficient $\alpha_{i,1,t}$ is modelled as a linear function of various measures of openness, with the parameters constrained to be identical in the cross-section. We employ the pooled time-series, cross-sectional (panel) Generalized Method of Moments estimator presented in Bekaert, Harvey, and Lundblad (2001). Standard errors are constructed to account for cross-sectional heteroskedasticity and the overlapping nature of the growth shocks, $\eta_{i,t+k,k}$. This estimator looks like an instrumental variable estimator but it reduces to pooled OLS under simplifying assumptions on the weighting matrix.

3.2 *Local versus (exogenous) global growth opportunities*

We present estimates for $\alpha_{i,1,t}$ in Table 4 for each of our three samples (fixed effects are not reported) for both GDP and investment growth. In the table, we force $\alpha_{i,1,t}$ to be an identical time-invariant constant across all countries. In panel A, we present estimates for regression (10), which explore the extent to which reported local market PE ratios house information about country-specific growth opportunities, using both LGO and LGO_MA. Unfortunately, the time-series history on local market PE ratios is limited (see Appendix Table A1); hence, we report estimates for an unbalanced panel, maximizing the sample history for each country.

[7] We also consider a risk-adjusted growth opportunities measure. We regress each global industry PE ratio onto the conditional world market variance, estimated as a GARCH(1,1), and then take the intercept and residual as the risk-adjusted PE ratio. Combining these *adjusted* global industry PE ratios with the corresponding industry weights, we obtain a risk-adjusted growth opportunities measure for each country. The evidence (not reported) is qualitatively unchanged.

Overall, country-specific growth opportunities, as measured by local PE ratios, are informative about future economic activity. For example, the estimates for all countries suggest that, on average, a one standard deviation increase in local growth opportunities, that is an increase of 0.3541 in LGO_MA, is associated with a 15 and 55 basis point increase in annual output and investment growth, respectively. The estimated effect is somewhat more pronounced for the developed markets than the general case (all countries), but in both cases highly statistically significant.

For the emerging markets, the association is positive, but weak economically and not uniformly significant. There are many possible reasons for this apart from a true lack of predictive information. First, we have fewer data points for emerging markets. Second, our tests may have less power for emerging markets because other factors, such as political risk or structural changes (market reforms for instance) may be relatively more important in driving prices than growth opportunities. Finally, the stock market in these countries is generally smaller and less representative of the total economy compared to developed markets.

In panel B of Table 4, we present evidence on regression (11) with exogenous growth opportunities. As robustness check, we also present the alternative measure of growth opportunities based on the value added weights. Recall that GGO and GGO_MA reflect the industrial composition within each country in accordance with the growth opportunities available to those industries in the global market. In this case, we obtain estimates for a full balanced panel across all three samples. Overall the global growth opportunity measure appears to be a strong, robust, and significant predictor of future output and investment growth in all samples. For example, the estimates for all countries suggest that, on average, a one standard deviation increase in global growth opportunities, that is an increase of 0.1866 in GGO_MA, is associated with a 27 and 74 basis point increase in annual output and investment growth, respectively. For the developed markets, the predictive power of the global measure is slightly weaker than the local measure for the level measures but stronger for the measures with a past moving average removed.

For emerging markets, the predictive power of the global measure is significantly better than the local measure, especially for investment growth. Except in the case of the

GGO_MA (VA) measure, the coefficients are always statistically significantly different from zero. Consequently, even though emerging markets may be segmented from global capital markets, local price information in emerging markets does a poorer job predicting future growth opportunities than global price information. Interestingly, using value added information about industrial composition rather than the industrial composition reflected in the stock market is not helpful even though the two measures correlate quite highly for most emerging markets. In Table 5 and future tables, we focus on the market capitalization based measures of exogenous growth opportunities. The evidence for the value-added measures is similar and is available upon request.

3.3 *The effects of financial sector openness*

Many of the countries in our sample have undergone regulatory reforms that may have implications for the ability of industries to capitalize on the growth opportunities available to them. In particular, we focus on the liberalization of the capital account, equity market, and banking sector. Countries which are closed to foreign investors typically also restrict the ability of their firms to raise capital abroad, preventing them from exploiting growth opportunities available to comparable industries in the global market. For example, an ADR issue cannot happen efficiently as long as the domestic stock market is subject to foreign ownership restrictions. Consequently, we expect growth opportunities to more strongly predict future growth in more financially open markets.

Capital account openness

The first panel in Table 5 presents estimates of the interaction between general capital account openness and exogenous growth opportunities in predicting future growth. The relation between growth and capital account liberalization is itself controversial. Rodrik (1998), Edison et al. (2002) claim that there is no correlation between capital account liberalization and growth prospects, whereas Edwards (2001), Bekaert, Harvey, and Lundblad (2004), and Quinn and Toyoda (2001) document a positive relationship. Arteta, Eichengreen and Wyplosz (2003) conduct robustness experiments using different measures of openness and

conclude that the relation between growth and capital account openness is fragile. We focus on our largest sample to maximize the cross-sectional variation in our various openness measures.

Our measures of capital account openness are based on the IMFs Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The first is an indicator variable that takes on a value of zero if the country has at least one restriction in the restrictions on payments for the capital account transactions category. The second measure, developed by Quinn (1997) and Quinn and Toyoda (2003), attempts to measure the degree of capital account openness; the measure is scored from 0 to 4, in half integer units, with a 4 representing a fully open economy. We transform Quinn's measure into a 0 to 1 scale. The measure is available for 48 of the 50 countries in our broadest sample.

For both the IMF and Quinn based measures of capital account openness, we find that the coefficient on the interaction between GGO_MA and the associated capital account openness indicator is positive in all cases. However, the interaction coefficient is never statistically significant at the 5% level.

Equity market liberalization

In Table 5 (panel B), we explore the interaction effect between the exogenous growth opportunity measure, GGO_MA, with indicators of equity market liberalization.

Our first measure, the official equity market liberalization indicator, is based on Bekaert and Harvey's (2002) detailed chronology of important financial, economic, and political events in many developing countries. The variable takes the value of one when it is possible for foreign portfolio investors to own the equity of a particular country and zero otherwise. Industrialized countries, such as the United States, are assumed to be fully liberalized throughout our sample. Our second measure uses data on foreign ownership restrictions to measure the degree of equity market openness. Following Bekaert (1995) and Edison and Warnock (2003), the measure is based upon the ratio of the market capitalization of the IFC investable to the IFC global indices in each country. The IFC's global stock index seeks to represent the local stock market whereas the investable index corrects the market capital-

ization for foreign ownership restrictions. Hence, a ratio of one means that all of the stocks in the local market are available to foreigners. Accordingly, $\alpha_{i,1,t}$ is a linear function of either the 0/1 indicator associated with official equity market liberalization or the continuous measure on the [0,1] interval capturing the degree of equity market openness.[8]

In contrast to the evidence for general capital account liberalization presented above, the link between growth opportunities and future output and investment growth is much stronger in economies that permit a greater degree of equity investment.[9] The interaction coefficient is always statistically significant, both for the official equity market liberalization indicator and the liberalization intensity. The constant term is still positive, but no longer significant. This evidence suggests that there is a strong association between the ability to exploit global growth opportunities and the degree of foreign investor access to the domestic equity market.

Banking openness

Finally, in Panel C of Table 5, we introduce a 0/1 indicator variable that captures periods when foreign banks are allowed to enter the domestic market either through the establishment of branches or subsidiaries or through the acquisition of local banks. Using a variety of sources, we have been able to determine important regulatory changes affecting foreign banks in 41 of our 50 countries over the past 23 years. The regression involving this new indicator therefore reflects a slightly smaller sample. The foreign banking liberalization indicator is equal to zero before and equal to one during and after the year of banking liberalization. Different from recent studies that have explored the effect of the presence of foreign banks onto the efficiency and stability of the local banking sector (e.g. Claessens, Demirgüç-Kunt, and Huizinga (2001)), our indicator variable is related to the regulatory environment foreign banks face with respect to establishing or expanding their operations in a local market. Unless foreign banks are allowed to enter a local market, we consider a country as closed

[8]As a robustness check, we included year fixed effects. These indicator variables are not significant and do not alter the conclusions. These results are available on request.

[9]Chari and Henry (2004) use firm-level data in 11 emerging markets and show that the growth rate in the capital stock increases on average following equity market liberalizations.

with respect to foreign banks, even if some foreign banks are already present in that country. We also construct a first sign indicator that changes from zero to one when a country takes a substantial first steps to improve access for foreign banks. Appendix table A2 lists the year of the banking liberalization for each of 41 countries.

Similar to the equity market liberalization effect, there is a strong association between the opening of the banking sector to foreign banks and the ability to exploit exogenous growth opportunities. The interaction coefficients between both of the banking liberalization indicators and growth opportunities are always positive and statistically significant.

3.4 *Exogenous Growth Opportunities, Financial Development, Investor Protection, and Political Risk*

There are many other country characteristics that may effectively segment markets, or prevent aligning growth opportunities with actual growth. First, we consider interaction effects with three important measures of *domestic* financial development: the ratio of private credit to GDP (banking development), equity market turnover and the ratio of equity market capitalization to GDP (both measures of equity market development). A vast literature documents a significant relationship between domestic banking development (for example, King and Levine (1993)) or stock market development (for example, Atje and Jovanovic (1989)) and economic growth. Table 6 (panel A) examines the role of the banking sector by adding an interaction term with the private credit ratio to the regression. The coefficient on the interaction with the private credit ratio enters positively for both output and investment growth, and is significant at the 10% and 5% levels for each, respectively. In Table 6, we also add, as additional interaction variables, equity market turnover (a measure of trading activity) and equity market capitalization scaled by GDP (a measure of the raw equity market size relative to the overall economy). The results show that the coefficients on turnover and size are actually negative in three of the four cases presented, but statistically insignificant for both output and investment growth in all cases. Together, this evidence suggests that domestic banking development is important for exploiting growth opportunities, but stock

market development is not. This stands in contrast to the evidence presented above on stock market *openness*.

Interestingly, this finding directly confirms the results in Fisman and Love (2004). They postulate that the relation between actual growth in an industry in a particular country and its growth opportunities should be stronger depending on the level of financial development in the country. They test this hypothesis without measuring growth opportunities by investigating the correlation of industry growth rates across countries. They find that countries have correlated intersectoral growth rates only if both countries have high private bank credit to GDP ratios. Other measures of financial development do not yield significant results.

The Fisman-Love test assumes the existence of globally correlated shocks, but ignores the presence of international capital flows. It is conceivable that international flows are the mechanism behind the correlation in cross-country sectoral growth rates not that these countries simply have well functioning financial markets. Panel D provides some exploratory analysis of this issue. We split up our observations into four groups. First, we sort observations into below or above median financial development, using the private credit to GDP ratio, then into financially open and closed using the official equity market openness indicator. We regress GDP and investment growth on our measure of growth opportunities interacted with an indicator variable for each of the four groups. The results overwhelmingly support the idea that it is openness that drives the alignment of growth opportunities with growth, not financial development. Even in market with poor financial development, the interaction coefficient is highly significant as long as the country has a liberalized equity market. The GDP growth interaction coefficients are at least twice as large for open versus closed equity markets.[10] Not surprisingly, a Wald test strongly rejects the equality of the open versus closed coefficients, while it fails to reject the equality of the coefficients for low versus high financial development.

Second, La Porta et al. (1997) have stressed the importance of investor protection and, more generally, the quality of institutions and the legal environment as sources for cross-

[10]Note that these results are unchanged when the sorting is done first on financial development.

country differences in financial development. We can directly investigate the effect of investor protection on the ability to exploit growth opportunities by interacting our growth opportunity measure with a measure of investor protection.

One of the major advantages of our framework is the panel setup, but unfortunately most measures of investor protection or the quality of (legal) institutions have no time dimension. We therefore use two measures obtained from ICRG's political risk ratings, Law and Order and a broader measure of the Quality of Institutions that reflects corruption, law and order, and bureaucratic quality. We also consider a 0/1 indicator that takes a value one after the first insider trading prosecution in each country (see Bhattacharya and Daouk (2002)). Panel B in Table 6 shows that investor protection itself does not seem to better align growth opportunities with growth. The highest t-statistic (1.70) occurs for the investment growth equation in relation to Law and Order. Shleifer and Wolfenzon (2002) suggest that improvements in investor protection have very different effects in open and closed economies. In particular, entrepreneurs suffer less from an improvement in investor protection under perfect capital mobility than under segmentation. Their analysis also predicts that entrepreneurs will be more opposed to improvements in investor protection where capital markets are closed to capital flows. Within our framework, their model would predict a significant interaction effect of investor protection with growth opportunities in *open* economies. We repeat the analysis over four sub-groups that we did for financial development for the Law and Order variable, also in panel D of Table 6. We find that the marginal effect of improved Law and Order in aligning growth opportunities with growth is insignificantly different from zero. Again, openness is more important both economically and statistically. Note that investor protection is likely to be priced and reflected in country-specific price earnings ratios (see La Porta et al. (1997) and Albuquerque and Wang (2004)). However, our analysis in Table 6 uses an *exogenous* growth opportunities measure, so it is not influenced by any country-specific factors.

Finally, we note that the Law and Order measures are part of the ICRG's political risk rating. Political risk may effectively segment capital markets (see Bekaert (1995)). It is well known that some institutional investors have guidelines that prohibit them from

investing in the equity markets of certain risky countries. For example, CalPERS, a large U.S. pension fund, has a Permissable Country Program, which explicitly weights political risk in determining whether a county is a permissable investment. Similarly, high levels of political risk may discourage foreign direct investment. In panel C, we consider the overall ICRG political risk rating - a composite of twelve subindices ranging from political conditions, the quality of institutions, socioeconomic conditions and conflict - and a measure of the investment profile in each country. The Investment Profile reflects the risk of expropriation, contract viability, payment delays, and the ability to repatriate profits. This measure is most closely correlated with political risks relevant for FDI.

The evidence suggests that high values for the political risk and the investment profile indices (larger numbers denote improved conditions) are associated with a greater ability to exploit exogenous growth opportunities. The overall positive coefficient of the political risk rating is not due to the quality of institutions variable (in panel B), but rather to those aspects of the legal and regulatory environment that directly relate to the stability and security of inward investment. This analysis generally confirms the importance of international capital flows in aligning growth opportunities with growth.

4 Growth Opportunities and Market Integration

4.1 *Econometric framework*

In Table 4, we presented evidence that exogenous growth opportunities predict future output and investment growth. Table 5 shows that the degree of predictability increases with equity market and banking sector openness. In this section, we link this predictability to tests of market integration. First, we explore whether the differential between local and exogenous growth opportunities predicts future growth in excess of world growth. Under full market integration, this should not be the case. That is, we test the null of market integration. Second, we explore whether the differential between exogenous and world average growth opportunities predicts future growth. In integrated market, countries that contain high (low) PE industries should growth at a faster (slower) rate than the rest of the world. In other

words, we test the null of market segmentation. Lastly, we explore what factors contribute to the ability of countries to take advantage of global growth opportunities. In particular, we investigate interaction effects between excess exogenous growth opportunities and capital account, equity market, and banking sector openness and liberalization.

To explore these questions, the regressions we consider are

$$y_{i,t+k,k} - y_{w,t+k,k} = \alpha_{i,0} + \alpha_{1,t} LEGO\_MA_{i,t} + \eta_{i,t+k,k} \quad (12)$$

$$y_{i,t+k,k} - y_{w,t+k,k} = \alpha_{i,0} + \alpha_{1,t} GEGO\_MA_{i,t} + \eta_{i,t+k,k}, \quad (13)$$

where $y_{i,t+k,k} - y_{w,t+k,k}$ is the k-year average growth rate of either real per capita gross domestic product or investment for country i in excess of the "world" counterpart. $LEGO\_MA_{i,t}$ $(= LGO\_MA_{i,t} - GGO\_MA_{i,t})$ is the difference between local and exogenous growth opportunities, and $GEGO\_MA_{i,t}$ $(= GGO\_MA_{i,t} - WGO\_MA_t)$ is the difference between exogenous growth opportunities and the growth opportunities measure for the world market.

4.2 *Tests of market integration and segmentation*

We first present results constraining $\alpha_{1,t}$ in equations (12) and (13) to be time-invariant constants.

4.2.1 *The null of market integration*

In integrated markets, (risk-adjusted) differences between local and exogenous growth opportunities should contain no information about future excess growth. We present results for regression (12) in panel A of Table 7. As before, the estimates for all countries and the emerging markets are obtained for an unbalanced panel (maximizing data availability). For these two samples, the observed relation between local excess growth opportunities and excess output is not significant. The weak to insignificant predictive effects may be due to the limited time-series availability of local market PE ratios.

In sharp contrast, the predictive effects of local excess growth opportunities are statistically significant for the developed markets for which we have a full balanced sample. This evidence suggests that, at least for this collection of countries, information contained

in country-specific growth opportunities, as measured by the difference between local and exogenous PE ratios, is informative about future growth. Hence, one interpretation of this finding is that we *reject* the null hypothesis of market integration for the developed markets. Here, our tests are consistent with the extant results on real quantity variables regarding market integration, not the results obtained using price information, which are typically favorable for the market integration hypothesis.

Given that the local growth opportunity measure has little predictive power for economic growth in emerging markets (see Table 4), our test results for emerging markets should not be interpreted as being in favor of market integration. In general, the main challenge we face in exploring market integration using local price earnings ratios is the limited sample that is available for inference. In the next section, however, we explore market integration in a different manner by evaluating whether excess growth opportunities measured using only global price information, predict excess growth. One key advantage of this methodology is that we obtain a full time series across all countries, increasing the power of our tests.

4.2.2 *The null of market segmentation*

In panel B of Table 7, we present evidence for the alternative regression (13) using *exogenous* growth opportunities in excess of their world counterpart. In this regression, we explore the degree to which country-specific industrial composition (relative to the world) predicts *excess* output and investment growth (relative to the world). If a country has an industrial base tilted towards high PE industries in the global market, it should grow faster than the world average. That is, integrated countries can only grow faster than the world through an industrial composition geared towards high growth opportunities.

For the emerging markets, none of the coefficients are significant, and some are even negative. We fail to reject the null of market segmentation for emerging countries. Consequently, even though we found strong predictive power of exogenous growth opportunities in the last section, these countries are, on average, not fully exploiting the growth opportunities available from their particular industrial mix. This result suggests that linking the predictability to the degree of openness across these markets may be fruitful, and we will do so in sec-

tion 4.3. For developed markets (and the results are similar for all countries combined), the coefficients are robustly positive, but we only reject the null of market segmentation in some cases, mostly for investment growth. It is likely that dividing countries into developed and emerging markets decreases the power of our tests because we mix financially open and closed countries in both sub-samples. For example, according to the IMF measure, Denmark had a closed capital account before 1988, whereas Malaysia had overall open capital markets throughout the sample until the late 1990's.

4.3 *Exogenous growth opportunities and openness*

We now re-estimate regressions (12) and (13), employing a collection of alternative openness measures as interaction variables in $\alpha_{i,1,t}$. For this section, we focus on our largest sample of 50 countries in order to maximize both the cross-sectional and time-series information in our sample. Our conjecture is that more open economies should be better poised to exploit global growth opportunities.

Table 8 presents estimates of the interaction for both *LEGO* (left-hand side) and *GEGO* (right-hand side) measures. The three panels correspond to different measures of openness as in Table 5. We start the discussion with the *LEGO* measure. Here, we expect the interaction effect to be negative. *LEGO* should not predict growth or investment when markets are fully integrated. The interaction effect is always negative for both of our capital account openness measures (panel A) and for the banking openness measures (panel C). This is true for both investment and output growth, but only the investment growth results are statistically significant. Also, for investment growth, the constant term and the interaction term are of about the same magnitude and the constant term is significantly positive. Hence, for open countries *LEGO* does not predict relative growth, but for segmented countries it does. For the equity liberalization measure, there are no significant coefficients, and some coefficients have the wrong sign.

For the *GEGO* measure, we expect the interaction effect to be positive. *GEGO* should predict relative growth for relatively open countries, but should not predict relative growth for segmented countries. The results are qualitatively consistent with this hypothesis. The

constant terms in all three panels are not statistically different from zero. The interaction effects are invariably positive, again with stronger effects for investment growth. Unfortunately, the coefficients often fail to be statistically significant. We only find statistical significance for the equity market liberalization indicators in the growth regressions and for the First Sign banking sector liberalization indicator for both GDP and investment growth.

Nevertheless, the results go some way to help resolve the seemingly contradictory results in Table 7. For the developed markets, we reject market integration, yet other tests suggested a rejection of market segmentation. For our largest sample, the evidence presented in Table 8 points towards (at least for some of our tests) a greater likelihood of market integration for countries that are more open. Such a mixed outcome is consistent with partial or time-varying integration where the ability to capitalize on world growth opportunities depends critically on country-specific factors. Our results show that our various measures of openness help differentiate countries along this dimension, but we are likely still omitting important factors.

5 Conclusions

Our research proposes a simple measure of country-specific growth opportunities based on price to earnings (PE) ratios set in global stock markets. To do so, we combine information about a country's industrial composition and the growth opportunities contained in global prices that each of these industries face. Importantly, we find that this measure of *exogenous* growth opportunities predicts future output and investment growth, and that the degree of predictability is positively associated with several measures of openness.

Next, we formulate a test of market integration based on the idea that if these growth opportunities are indeed globally priced and exploited, the difference between local and global price-earnings ratios should not predict the relative growth performance of a country. We present evidence that suggests a rejection of this hypothesis for developed countries but the test lacks power for a wider sample of countries. Conversely, in integrated markets, the difference in industrial composition relative to the world multiplied with world price earnings

ratios should be a main driver of relative growth, as it should be the countries with the high PE ratio industries that capture the highest growth rates. Even though we have more data for this test, we find mixed evidence on the test of the null of market segmentation. For emerging markets, we fail to reject the null of market segmentation.

Of course, in reality the degree of integration varies across countries and across time. To allow for the possibility of a time-varying, country-specific ability to exploit global growth opportunities, we interact our measure of excess global growth opportunities with a number of measures capturing varying degrees of openness such as capital account, equity market, and banking sector liberalizations. Importantly, we find evidence that suggests a greater likelihood of market integration in more open economies; however, the evidence is not entirely uniform across openness measures and the relevant coefficients are not always statistically significant.

In future work, we plan to more accurately measure the variation in the degree of integration over time and its effect on the ability to exploit growth opportunities. For example, every additional country opening its capital markets (allowing both inward and outward investment) should enhance the overall ability to exploit global growth opportunities.

Of course, there is a large list of factors that may effectively segment or help integrate countries into the world economy. In our research, we investigate measures of financial development, investor protection, and political risk. Banking development, as in Fisman and Love (2004), shows a significant interaction effect with growth opportunities. Our results also suggest that the existing literature is omitting a critically relevant variable. Financial market openness seems a more important determinant of the ability to exploit growth opportunities than is financial development. In future work, we plan to investigate whether international capital in the form of FDI and portfolio flows indeed "follows" growth opportunities. This research may usefully complement recent work by Baker, Foley, and Wurgler (2004), who have argued that FDI is mostly driven by cheap capital in host countries.

6 Appendix A: Price-Earnings Ratios and Growth Opportunities

We consider a simple present value model under the null of financial market integration. We begin by defining log earnings growth, $\Delta \ln(EA_t)$, with EA_t the earnings level, in country i, industry j as:

$$\Delta \ln(EA_{i,j,t}) = \gamma_{i,j} GO_{w,j,t-1} + \epsilon_{i,j,t}. \tag{14}$$

Earnings growth is affected by world-wide growth opportunities in industry j, defined as $GO_{w,j,t}$ and an idiosyncratic noise term which we assume to be $N(0, \sigma^2_{i,j})$. In the solution presented above, we assume $\gamma_{i,j} = 1$, but we provide the more general solution below. Growth opportunities themselves follow a persistent stochastic process:

$$GO_{w,j,t} = \mu_j + \varphi_j GO_{w,j,t-1} + \epsilon_{w,j,t}. \tag{15}$$

We assume $\epsilon_{w,j,t} \sim N(0, \sigma^2_{w,j})$. Under the hypothesis of market integration, the discount rate for each industry in each country is simply a multiple of the world discount rate:

$$\delta_{i,j,t} = r_f(1 - \beta_{i,j}) + \beta_{i,j}\delta_{w,t}. \tag{16}$$

The constant term, with r_f equal to the risk free rate, arises because the discount rates are *total* not *excess* discount rates. An equation like (16) would follow from a logarithmic version of the standard world CAPM. The world discount rate process follows:

$$\delta_{w,t} = d_w + \phi_w \delta_{w,t-1} + \eta_{w,t}, \tag{17}$$

with $\eta_{w,t} \sim N(0, s^2_w)$. An important assumption is that under the null of market integration, industries in different countries face the same discount rate; that is,

$$\beta_{i,j} = \beta_j. \tag{18}$$

Suppose that each industry pays out all earnings, EA_t, each period, then the valuation of the industry under (14)-(17) is:

$$V_{i,j,t} = E_t[\sum_{k=1}^{\infty} exp(-\sum_{l=0}^{k-1} \delta_{i,j,t+l}) EA_{i,j,t+k}]. \tag{19}$$

Given that we model earnings growth as in equation (14), the earnings process is non-stationary. We must scale the current valuation by earnings, and impose a transversality condition to obtain a solution:

$$\begin{aligned} PE_{i,j,t} = \frac{V_{i,j,t}}{EA_{i,j,t}} &= E_t[\sum_{k=1}^{\infty} exp(\sum_{l=0}^{k-1} -\delta_{i,j,t+l} + \Delta \ln(EA_{i,j,t+1+l}))] \\ &= \sum_{k=1}^{\infty} Q_{i,j,k,t}. \end{aligned} \tag{20}$$

Note that for $k = 1$,

$$\begin{aligned} Q_{i,j,1,t} &= E_t[exp(-\delta_{i,j,t} + \Delta \ln(EA_{i,j,t+1}))] \\ &= exp(-r_f(1-\beta_{i,j}) - \beta_{i,j}\delta_{w,t} + \gamma_{i,j}GO_{w,j,t} - \frac{1}{2}\sigma_{i,j}^2). \end{aligned} \tag{21}$$

Consequently, we conjecture

$$Q_{i,j,k,t} = exp(a_{i,j,k} + b_{i,j,k}\delta_{w,t} + c_{i,j,k}GO_{w,j,t}). \tag{22}$$

Although a full closed-form solution can be found, for our purposes it suffices to characterize the recursive equations describing the $a_{i,j,k}$, $b_{i,j,k}$, and $c_{i,j,k}$ coefficients.

$$\begin{aligned} Q_{i,j,k+1,t} &= E_t[exp(\sum_{l=0}^{k} -\delta_{i,j,t+l} + \Delta \ln(EA_{i,j,t+1+l}))] \\ &= E_t[exp(-\delta_{i,j,t} + \Delta \ln(EA_{i,j,t+1})) \cdot exp(\sum_{l=0}^{k-1} -\delta_{i,j,t+1+l} + \Delta \ln(EA_{i,j,t+2+l}))] \\ &= E_t[exp(-\delta_{i,j,t} + \Delta \ln(EA_{i,j,t+1}) + a_{i,j,k} + b_{i,j,k}\delta_{w,t+1} + c_{i,j,k}GO_{w,j,t+1})]. \end{aligned} \tag{23}$$

Consequently,

$$\begin{aligned} & exp(a_{i,j,k+1} + b_{i,j,k+1}\delta_{w,t} + c_{i,j,k+1}GO_{w,j,t}) \\ = exp\{a_{i,j,k} + b_{i,j,k}d_w + c_{i,j,k}\mu_j - r_f(1-\beta_{i,j}) - \tfrac{1}{2}(\sigma_{i,j}^2 + b_{i,j,k}^2 s_w^2 + c_{i,j,k}^2\sigma_{w,j}^2) \\ +(\gamma_{i,j} + c_{i,j,k}\varphi_j)GO_{w,j,t} + (-\beta_{i,j} + b_{i,j,k}\phi_w)\delta_{w,t}\}. \end{aligned} \tag{24}$$

Hence, matching coefficients, we find:

$$a_{i,j,k+1} = a_{i,j,k} - r_f(1-\beta_{i,j}) + b_{i,j,k}d_w + c_{i,j,k}\mu_j - \frac{1}{2}(\sigma_{i,j}^2 + b_{i,j,k}^2 s_w^2 + c_{i,j,k}^2\sigma_{w,j}^2) \tag{25}$$

$$b_{i,j,k+1} = -\beta_{i,j} + b_{i,j,k}\phi_w \tag{26}$$

$$c_{i,j,k+1} = \gamma_{i,j} + c_{i,j,k}\varphi_j. \tag{27}$$

$$\tag{28}$$

Because of the assumption (18), we can write $b_{i,j,k+1} = b_{j,k+1}$. Also, the country dependence in growth opportunities hinges entirely on $\gamma_{i,j}$. We assume that in a fully integrated world

$$\gamma_{i,j} = \gamma_j = 1. \tag{29}$$

That is, earnings growth in a particular industry should not depend on the country in which the industry is located. If that is the case, it is logical to assume that γ_j is 1 because growth opportunities are industry specific. Bringing everything together, we find that the price earnings ratio for a particular industry in a particular country can be written as:

$$PE_{i,j,t} = \sum_{k=1}^{\infty} exp(a_{i,j,k} + b_{j,k}\delta_{w,t} + c_{j,k}GO_{w,j,t}) \tag{30}$$

An improvement in growth opportunities revises price earnings ratios for the industry upward everywhere in the world, and the change in the PE-ratio is larger when $GO_{w,j,t}$ is more persistent. Similarly, a reduction in the world discount rate increases the PE-ratio with the magnitude of the response depending upon the persistence of the discount rate process and the beta of the industry. Equation (30) can be linearized around the mean values for $\delta_{w,t}$ and $GO_{w,j,t}$ leading to the expression in the text (equation (4)).

7 Appendix B: Constructing Measures of Growth Opportunities

Local Growth Opportunities

LGO as defined in (5) is approximately the log of the market PE ratio of a given country. We collect PE ratios from Datastream for the last day of each month. Thirteen of our 50 countries are not covered by Datastream and we use PE ratios from IFC instead. For Italy, Norway, Spain, and Sweden, we use data from MSCI to exploit the longer time series compared to Datastream. In a few cases, we encounter negative PE ratios. We replace those by the maximum PE ratio observed up to that point. The latter is in no case larger than 100. Table A1 reports for each country which data are used to construct *LGO* and in which month the coverage begins.

Exogenous Global Growth Opportunities

GGO as defined in (6) is the log of the inner product of the vector of global industry PE ratios and the vector of lagged country-specific industry weights. While Datastream is the only source for the global industry PE ratios, we use different sources to derive country-specific industry weights, in particular we use Datastream as well as IFC data to derive an industry's relative market capitalization, our principal measure of industry-weights, and UNIDO data to derive an industry's relative value added (VA), an alternative measure of industry-weights. For each of these measures, technical appendices that describe how we match the different industry classifications are available upon request.

Market capitalization based industry weights

For 21 out of the 50 countries in our sample we combine the market values for 35 industrial sectors covered by Datastream with the corresponding global PE ratios for the same 35 industries.[11] Note that the market capitalizations reflect information as of December 31 of the previous year with respect to the information contained in the PE ratios.[12]

For the remaining 29 countries, we derive industry weights from market capitalization data reported by IFC. IFC employs the 2-digit SIC classification, with 82 industry groups. To combine these industry weights with the global industry PE ratios from Datastream, we link the 101 industrial sub-sectors from Datastream to the 82 SIC groups, obtaining global PE ratios for each SIC group.[13] Whenever more than one Datastream sub-sector is included in an SIC group, we calculate the weighted average of the PE ratios of the entering sub-

[11] Datastream uses the FTSE industry classification with 35 industrial sectors (level 3 in Datastream) and 101 sub-sectors (level 5 in Datastream). For a detailed description see "FTSE Global Classification System", available at http://www.ftse.com.

[12] If t = May 1985 and $GGO_{i,t} = ln[IW'_{i,t-1}PE_{w,t}]$, the industry weights, $IW_{i,t-1}$, will reflect the industrial composition in country i as of December 31, 1984, while the global industry PE ratios, $PE_{w,t}$, reflect information as of May 31, 1985. The only exceptions to this rule are 1973, where the industry weights are as of December 31, 1973, and cases where the Datastream country coverage starts after 1973. If Datastream coverage for a specific country starts after 1973, we use the earliest available observation for the previous years without observations. See Table A1 for details.

[13] For the Datastream sub-sector "Mortgage Finance" we replace the PE ratio between December 1981 and February 1983 by the PE ratio of the industrial sector "Spc. and Other Finance" (after adjusting its level appropriately), as the original PE ratio takes on extreme values of up to 1,976.

sectors using the sub-sectors' market values as of December 31 of the same year. Industry weights again reflect information as of December 31 of the previous year with respect to the information contained in the PE ratios.[14]

Value added (VA) based industry weights
As an alternative to the market capitalization based weights, we also derive industry weights from an industry's relative value added. We obtain annual value added data for 28 manufacturing industries, classified according to the 3-digit ISIC (rev. 2), from the UNIDO Industrial Statistics Database starting in 1973. Since the UNIDO database contains information only on the manufacturing sector, industry weights are calculated relative to the value added of the manufacturing sector. To combine these industry weights with the global industry PE ratios from Datastream, we link the 101 industrial sub-sectors from Datastream to the 28 ISIC manufacturing industries, obtaining global PE ratios for each ISIC group. Whenever more than one Datastream sub-sector is included in an ISIC group, we calculate the weighted average of the PE ratios of the entering sub-sectors using the sub-sectors' market values as of December 31 of the same year. Industry weights again reflect information as of December 31 of the previous year with respect to the information contained in the PE ratios.[15]

World Growth Opportunities
WGO as defined in (8) is approximately the log of the PE ratio of the world market. The world market PE ratio for the last of each month is collected from January 1973 until December 2002 from Datastream.

Measures of Excess Growth Opportunities
For the construction of $LEGO$ we use the market capitalization based measure of global growth opportunities, GGO. We construct $GEGO$ by subtracting WGO from GGO.

Moving Average Correction
By subtracting a 60-month moving average from each original series we obtain adjusted series which we denote by the extension "$\_MA$". For example, LGO_MA is calculated as:

$$LGO\_MA_{i,t} = LGO_{i,t} - \frac{1}{60} \sum_{s=t-60}^{t-1} LGO_{i,s} \tag{31}$$

GGO_MA,$GGO\_MA(VA)$, $LEGO\_MA$, $GEGO\_MA$ and $GEGO\_MA(VA)$ are calculated analogously.

[14]The only exceptions to this rule are the years 1973 through 1975, where the industry weights are as of December 31, 1975, cases where IFC country coverage starts after 1975, and values for 2001 where the industry weights are as of December 31, 2000. If IFC coverage for a specific country starts after 1975, we use the earliest available observation for the previous years without observations. See Table A1 for details.

[15]The only exceptions to this rule are cases where UNIDO country coverage starts after 1973, and values for 1999 through 2001 where the industry weights are same as in 1998. If UNIDO coverage for a specific country starts after 1973, we again use the earliest available observation for the previous years without observations. See Table A1 for details.

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Table 1

Predictive Power of Growth Opportunity Measures in Integrated and Segmented Markets

	Predicting Economic Growth	
Definition	*Market Integration*	*Market Segmentation*
LGO is a local measure of country-specific growth opportunities. LGO is the weighted sum of a country's industry PE ratios. The weights are the relative capitalization of industries within the country. It is expressed in logs.	LGO **predicts** economic growth independently from the degree of market integration.	
GGO is a global measure of growth opportunities, i.e. country-specific growth opportunities implied by the global market. GGO is the weighted sum of global industry PE ratios. The weights are determined by relative market capitalization. It is expressed in logs.	GGO **predicts** economic growth, since LGO and GGO move closely together.	GGO does **not predict** economic growth, since global prices are not relevant for local markets.
LEGO is a local measure of country-specific growth opportunities in excess of world growth opportunities. LEGO is the difference between LGO and GGO.	LEGO does **not predict** economic growth in excess of world growth since it is zero or constant.	LEGO **predicts** economic growth in excess of world economic growth. Local and global prices contain different information.
GEGO is a global measure of country-specific growth opportunities in excess of world growth opportunities. GEGO is the difference between GGO and the log of the world market PE ratio (WGO). GEGO is different from zero when a country's industry composition differs from the world's industry composition.	GEGO **predicts** economic growth in excess of world economic growth. Differences in industry composition are the only factors leading to differences in economic growth.	GEGO does **not predict** economic growth, since global prices are not relevant for local markets.

For each growth opportunity measure we state its ability to predict economic growth under the two opposing assumptions of market integration and segmentation.

Table 2

Description of the Variables

All data are employed at the annual frequency.

Variable	Description
LGO and LGO_MA	LGO and LGO_MA are local measures of country-specific growth opportunities. LGO is the log of a country's market PE ratio. LGO_MA is LGO less a 60-month moving average. For a subset of 17 developed countries, both variables are available from 1980 through 2002. For the other countries, starting points vary. For details see Appendix B. Source: *Datastream, S&P Emerging Markets Data Base, MSCI.*
GGO and GGO_MA	GGO and GGO_MA are global measures of country-specific growth opportunities. GGO is the log of the inner product of the vector of global industry PE ratios and the vector of country-specific industry weights. Country-specific industry weights are determine by relative market capitalization. We also investigate an alternative set of weights based on the relative value added (VA) of the industries in a country. GGO_MA is GGO less a 60-month moving average. Available for all 50 countries from 1980 through 2002. See Appendix B for details. Source: *Datastream, S&P Emerging Markets Data Base, UNIDO Industrial Statistics Database*
LEGO and LEGO_MA	LEGO and LEGO_MA are local measures of country-specific growth opportunities in excess of world growth opportunities. LEGO is the difference between LGO and GGO. LEGO_MA is LEGO less a 60-month moving average. For sample II (17 countries) both variables are available from 1980 through 2002. For other countries, starting points vary. See Appendix B for details. Source: *Datastream, S&P Emerging Markets Data Base, MSCI.*
GEGO and GEGO_MA	GEGO and GEGO_MA are global measures of country-specific growth opportunities in excess of world growth opportunities. GEGO is the difference between GGO and WGO, the log of the world market price to earnings ratio. GEGO_MA is GEGO less a 60-month moving average. Available for all 50 countries from 1980 through 2002. See Appendix B for details. Source: *Datastream, S&P Emerging Markets Data Base, UNIDO Industrial Statistics Database*
Gross domestic product (GDP) growth	Growth of real per capita gross domestic product. Available for all countries from 1980 through 2002. Source: *World Bank Development Indicators* CD-ROM.
Investment growth	Growth of real per capita gross fixed capital formation, which includes land improvements (fences, ditches, drains, and so on), plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Available for all countries from 1980 through 2002. Source: *World Bank Development Indicators* CD-ROM.
	Measures of Openness
IMF Capital account liberalization indicator	We measure capital account openness by employing the the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). This publication reports six categories of information. The capital account liberalization indicator takes on value of zero if the country has at least one restriction in the "restrictions on payments for the capital account transaction" category.
Quinn Capital account liberalization indicator	Quinn's capital account openness measure is also created from the text of the annual volume published by the International Monetary Fund (IMF), *Exchange Arrangements and Exchange Restrictions.* Rather than the indicator constructed by the IMF that takes a 1 if any restriction is in place, Quinn's openness measure is scored 0-4, in half integer units, with 4 representing a fully open economy. The measure hence facilitates a more nuanced view of capital account openness, and is available for 48 countries in our study. We transform the measure into a 0 to 1 scale.
Official equity market liberalization indicator	Corresponding to a date of formal regulatory change after which foreign investors officially have the opportunity to invest in domestic equity securities. Official Liberalization dates are based on Bekaert and Harvey (2002) *A Chronology of Important Financial, Economic and Political Events in Emerging Markets,* http://www.duke.edu/~charvey/chronology.htm. This chronology is based on over 50 different source materials. A condensed version of the chronology, along with the selection of dates for a number of countries appears in Bekaert and Harvey (2000). We have extended their official liberalization dates to include Japan, New Zealand, and Spain. For the liberalizing countries, the associated official liberalization indicator takes a value of one when the equity market is officially liberalized and thereafter, and zero otherwise. For the remaining countries, fully segmented countries are assumed to have an indicator value of zero, and fully liberalized countries are assumed to have an indicator value of one. These dates appear in Appendix Table A2.

Table 2
(Continued)

Variable	Description
Intensity equity market liberalization indicator	Following Bekaert (1995) and Edison and Warnock (2003), the intensity measure is based on the ratio of the market capitalization of the constituent firms comprising the IFC Investable index to those that comprise the IFC Global index for each country. The IFC Global index, subject to some exclusion restrictions, is designed to represent the overall market portfolio for each country, whereas the IFC Investable index is designed to represent a portfolio of domestic equities that are available to foreign investors. A ratio of one means that all of the stocks are available to foreign investors. Fully segmented countries have an intensity measure of zero, and fully liberalized countries have an intensity measure of one.
Foreign banking liberalization indicator	Using a variety of sources (e.g. National Treatment Study, Fitch Ratings Country Reports, interviews with local regulatory bodies), we determine when foreign banks gain access to the domestic banking market through the establishment of branches or subsidiaries or through the acquisition of local banks. The Foreigr banking liberalization indicator is equal to zero before and equal to one during and after the year of banking liberalization. We also construct a First Sign indicator that changes from zero to one when a country takes substantial first steps to improve access for foreign banks. Both indicator variables are available for 41 countries. Banking liberalization dates appear in Appendix Table A2.
	Financial Development and Political Risk
Private credit/GDP	Private credit divided by gross domestic product. Credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable that establish a claim for repayment. Available for all countries from 1980 through 2002. Source: *World Bank Development Indicators* CD-ROM.
Equity market turnover	The ratio of equity market value traded to the market capitalization. The data are available for 50 countries from 1980 through 2002. Source: Standard and Poor's/International Finance Corporation's *Emerging Stock Markets Factbook.*
Equity market size	The ratio of equity market value capitalization to GDP. The data are available for 50 countries from 1980 through 2002. Source: Standard and Poor's/International Finance Corporation's *Emerging Stock Markets Factbook.*
Quality of Institutions	The sum of the International Country Risk Guide (ICRG) Political Risk (ICRGP) subcomponents: Corruption, Law and Order, and Bureaucratic Quality.
Law and Order	ICRG political risk sub-component. PRS assesses Law and Order separately, with each sub-component comprising zero to three points. The Law sub-component is an assessment of the strength and impartiality of the legal system, while the Order sub-component is an assessment of popular observance of the law. Thus, a country can enjoy a high rating (3.0) in terms of its judicial system, but a low rating (1.0) if the law is ignored for a political aim.
Insider trading law indicator	Bhattacharya and Daouk (2002) document the first prosecution of insider trading laws. The indicator variable takes the value of one following the the insider trading law's first prosecution.
Political risk rating	The value of the the Political Risk Service (PRS) Group's political risk rating indicator which ranges between 0 (high risk) and 100 (low risk). The risk rating is a combination of 12 subcomponents. The data are available from 1984 through 2002. For each country, we backfill the 1984 value to 1980. Source: Various issues of the *International Country Risk Guide.*
Investment Profile	ICRG political risk sub-component (12% weight). This is a measure of the government's attitude to inward investment. The investment profile is determined by PRS's assessment of three sub-components: (i) risk of expropriation or contract viability; (ii) payment delays; and (iii) repatriation of profits. Each sub-component is scored on a scale from zero (very high risk) to four (very low risk).

Table 3

Summary Statistics: LGO, GGO, LEGO, and GEGO

1980 - 2002 - Annual Frequency

Panel A: Measures of Growth Opportunities

		Mean				Standard Deviation			
Sample	Country	LGO	GGO	LEGO	GEGO	LGO	GGO	LEGO	GEGO
	World	2.902	-	-	-	0.298	-	-	-
I	Sample I: All Countries	2.720	2.932	-0.339	0.030	0.583	0.295	0.522	0.150
II	Sample II: Developed	2.794	2.945	-0.208	0.044	0.518	0.288	0.369	0.128
III	Sample III: Emerging	2.601	2.911	-0.494	0.009	0.617	0.298	0.599	0.152

Panel B: Measures of Growth Opportunities with MA-Adjustment

		Mean				Standard Deviation			
Sample	Country	LGO_ MA	GGO_ MA	LEGO_ MA	GEGO_ MA	LGO_ MA	GGO_ MA	LEGO_ MA	GEGO_ MA
	World	0.082	-	-	-	0.177	-	-	-
I	Sample I: All Countries	0.036	0.071	-0.016	-0.011	0.396	0.198	0.381	0.102
II	Sample II: Developed	0.057	0.072	-0.016	-0.010	0.281	0.192	0.239	0.090
III	Sample III: Emerging	-0.004	0.071	-0.023	-0.011	0.506	0.200	0.519	0.105

Panel C: Correlations between Measures of Growth Opportunities

		Growth Opportunities			Growth Opportunities with MA-Adjustment		
Sample	Country	LGO, WGO	LGO, GGO	GGO, WGO	LGO, WGO	LGO, GGO	GGO, WGO
I	Sample I: All Countries	0.252	0.298	0.870	0.273	0.323	0.857
II	Sample II: Developed	0.498	0.560	0.903	0.484	0.545	0.882
III	Sample III: Emerging	0.097	0.103	0.866	0.048	0.117	0.852

Table 3 presents summary statistics for our unadjusted and moving-average adjusted growth opportunity measures, averaged over different country groups. Data are not available for all years. For a definition of the different measures for growth opportunities, LGO, WGO, and GGO, including the growth opportunities measures with the MA-Adjustment, see Appendix B.

Table 4

Growth Predictability

Annual Average Real GDP and Investment Growth (Five-year horizon)

1980-2002

Panel A: Local Growth Opportunities

	GDP growth			Investment growth		
	All Countries	Developed	Emerging	All Countries	Developed	Emerging
LGO	0.0026	0.0072	0.0017	0.0071	0.0256	0.0001
	(0.0004)	(0.0013)	(0.0006)	(0.0017)	(0.0044)	(0.0042)
LGO_MA	0.0043	0.0097	0.0040	0.0154	0.0279	0.0118
	(0.0001)	(0.0018)	(0.0125)	(0.0040)	(0.0062)	(0.0075)

Panel B: Exogenous (Implied) Global Growth Opportunities

	GDP growth			Investment growth		
	All Countries	Developed	Emerging	All Countries	Developed	Emerging
GGO	0.0070	0.0033	0.0131	0.0408	0.0211	0.0704
	(0.0019)	(0.0026)	(0.0026)	(0.0060)	(0.0085)	(0.0080)
GGO_MA	0.0142	0.0163	0.0106	0.0397	0.0489	0.0223
	(0.0023)	(0.0031)	(0.0035)	(0.0071)	(0.0102)	(0.0112)
GGO (VA)	0.0081	0.0061	0.0117	0.0347	0.0252	0.0552
	(0.0017)	(0.0023)	(0.0027)	(0.0055)	(0.0072)	(0.0089)
GGO_MA (VA)	0.0101	0.0114	0.0056	0.0235	0.0345	0.0052
	(0.0018)	(0.0024)	(0.0030)	(0.0056)	(0.0075)	(0.0088)

The samples included reflect 50 (all), 17 (developed), and 30 (emerging) countries detailed in the data appendix. The dependent variables are either the 5-year average growth rate of real per capita gross domestic product or investment. We include in the regressions, but do not report, fixed effec We report the coefficient on the lagged growth opportunities measure. In Panel A, we measure local growth opportunities. For the full sample and the emerging markets, these regressions are unbalanced based on data availability. In Panel B, we measure exogenous growth opportunities. We also report evidence for the alternative value added (VA) industry weights. The weighting matrix we employ in our GMM estimation provides a correction for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Table 5

Exogenous Growth Opportunities and Openness

Annual Average Real GDP and Investment Growth (Five-year horizon)

50 countries: 1980-2002

Panel A: Capital Account Openness

	GDP	Investment
GGO_MA	0.0123	0.0325
	(0.0029)	(0.0084)
GGO_MA*Capital Account Openness (IMF)	0.0032	0.0183
	(0.0044)	(0.0137)
GGO_MA	0.0060	0.0167
	(0.0053)	(0.0171)
GGO_MA*Capital Account Degree of Openness (Quinn)	0.0105	0.0343
	(0.0074)	(0.0242)

Panel B: Equity Market Openness

	GDP	Investment
GGO_MA	0.0061	0.0143
	(0.0037)	(0.0120)
GGO_MA*Official Equity Market Liberalization	0.0122	0.0372
	(0.0044)	(0.0141)
GGO_MA	0.0063	0.0118
	(0.0037)	(0.0113)
GGO_MA*Equity Market Degree of Openness	0.0127	0.0439
	(0.0045)	(0.0142)

Panel C: Banking Sector Openness

	GDP	Investment
GGO_MA	0.0074	0.0171
	(0.0042)	(0.0116)
GGO_MA*Banking Sector Liberalization	0.0118	0.0419
	(0.0048)	(0.0145)
GGO_MA	0.0072	0.0071
	(0.0049)	(0.0130)
GGO_MA*Banking Sector Liberalization (First Sign)	0.0107	0.0475
	(0.0053)	(0.0147)

The sample includes 50 developed and emerging countries detailed in the data appendix. The dependent variables are either the 5-year average growth rate of real per capita gross domestic product or investment. We include in the regressions, but do not report, fixed effects. We measure exogenous growth opportunities as GGO_MA. We report the coefficient on the growth opportunities measure and interaction terms with 1) a 0/1 indicator of capital account openness from the IMF, 2) a continuous measure of the degree of capital account openness from Quinn (only 48 countries are available), 3) official equity market liberalization from Bekaert, Harvey and Lundblad (2004), 4) the degree of equity market openness (investability), and 5) two indicators of banking sector liberalization -- opening the banking sector to foreign banks (given data limitations, this regression covers only 41 countries). The weighting matrix we employ in our GMM estimation provides a correction for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Table 6

Exogenous Growth Opportunities, Financial Development, Investor Protection, and Political Risk

Annual Average Real GDP and Investment Growth (Five-year horizon)

50 countries: 1980-2002

Panel A: Financial Development

	GDP	Investment
GGO_MA	0.0067	0.0114
	(0.0042)	(0.0126)
GGO_MA*Private Credit	0.0116	0.0408
	(0.0060)	(0.0166)
GGO_MA	0.0167	0.0488
	(0.0027)	(0.0089)
GGO_MA*Equity Market Turnover	-0.0084	-0.0307
	(0.0053)	(0.0191)
GGO_MA	0.0142	0.0378
	(0.0027)	(0.0082)
GGO_MA*Equity Market Size	-0.0021	0.0054
	(0.0064)	(0.0194)

Panel B: Investor Protection

	GDP	Investment
GGO_MA	0.0079	0.0070
	(0.0060)	(0.0203)
GGO_MA*Law and Order (ICRG)	0.0084	0.0429
	(0.0075)	(0.0252)
GGO_MA	0.0096	0.0133
	(0.0074)	(0.0230)
GGO_MA*Quality of Institutions (ICRG)	0.0060	0.0350
	(0.0093)	(0.0291)
GGO_MA	0.0143	0.0402
	(0.0023)	(0.0072)
GGO_MA*Insider Trading Prosecution	-0.0016	-0.0026
	(0.0057)	(0.0183)

Panel C: Political Risk

	GDP	Investment
GGO_MA	-0.0064	-0.0212
	(0.0091)	(0.0291)
GGO_MA*Political Risk (ICRG)	0.0289	0.0850
	(0.0124)	(0.0394)
GGO_MA	0.0002	-0.2092
	(0.0071)	(0.0231)
GGO_MA*Investment Profile (ICRG)	0.0226	0.0968
	(0.0115)	(0.0366)

Panel D: Openness, Financial Development, and Law and Order

	GDP	Investment
Low Private Credit/Closed Equity Market	0.0063	0.0074
	(0.0041)	(0.0124)
Low Private Credit/Open Equity Market	0.0220	0.0537
	(0.0040)	(0.0142)
High Private Credit/Closed Equity Market	0.0063	0.0374
	(0.0066)	(0.0262)
High Private Credit/Open Equity Market	0.0152	0.0489
	(0.0029)	(0.0089)
Wald Tests:		
Closed versus Open	15.17***	10.17***
Low versus High Private Credit	1.60	2.56

	GDP	Investment
Low Law and Order/Closed Equity Market	0.0062	0.0134
	(0.0038)	(0.0122)
Low Law and Order/Open Equity Market	0.0173	0.0367
	(0.0058)	(0.0177)
High Law and Order/Closed Equity Market	0.0073	0.0167
	(0.0187)	(0.0522)
High Law and Order/Open Equity Market	0.0183	0.0544
	(0.0026)	(0.0086)
Wald Tests:		
Closed versus Open	6.10**	1.47
Low versus High Law and Order	0.02	0.40

The sample includes 50 developed and emerging countries detailed in the data appendix. The dependent variables are either the 5-year average growth rate of real per capita gross domestic product or investment. We include in the regressions, but do not report, fixed effects. We measure exogenous growth opportunities as GGO_MA. We report the coefficient on the growth opportunities measure and interaction terms with financial development (Panel A): 1) the ratio of private credit to GDP, 2) equity market turnover, 3) the ratio of equity market capitalization to GDP; Investor Protection (Panel B): 1) the ICRG law and order subcomponent, 2) the ICRG quality of institutions subcomponent, and 3) the insider trading prosecution indicator; and Political Risk (Panel C): 1) the composite ICRG political risk rating and 2) the ICRG investment profile subcomponent. In Panel D, we interact the growth opportunities measure with four indicators constructed by grouping all country-years into one of four boxes. The interaction variables are as follows: an indicator that takes a value of one when the variable (private credit or law and order) is below the median and the equity market is closed, and zero otherwise; an indicator that takes the value of one when the variable is below the median and the equity market is open, and zero otherwise; an indicator that takes the value of one of the variable is above the median and the equity market is closed, and zero otherwise; and finally, and indicator that takes the value of one when the variable is above the median and the equity market is open, and zero otherwise. We include chi-squared statistics for two sets of Wald tests: 1) the first evaluates closed versus open equity markets by jointly testing whether the first and second and the third and fourth coefficients are equivalent; 2) the second evaluates low versus high levels of either the private credit or law and order measures by jointly testing whether the first and third and second and fourth coefficients are equal. *** and ** indicate significance at the 1% and 5% levels, respectively. The weighting matrix we employ in our GMM estimation provides a correction for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Table 7

Exploiting Growth Opportunities

Annual Average Excess Real GDP and Investment Growth (Five-year horizon)

1980-2002

Panel A: Local vs. Implied Global Growth Opportunities

	Excess GDP growth			Excess Investment growth		
	All Countries	Developed	Emerging	All Countries	Developed	Emerging
LEGO	0.0011	0.0099	-0.0004	0.0002	0.0255	-0.0011
	(0.0018)	(0.0014)	(0.0009)	(0.0060)	(0.0046)	(0.0046)
LEGO_MA	0.0006	0.0063	-0.0017	0.0050	0.0114	0.0066
	(0.0007)	(0.0016)	(0.0013)	(0.0034)	(0.0053)	(0.0090)

Panel B: Excess Exogenous (Implied) Global Growth Opportunities

	Excess GDP growth			Excess Investment growth		
	All Countries	Developed	Emerging	All Countries	Developed	Emerging
GEGO	0.0021	0.0039	-0.0004	0.0151	0.0246	-0.0066
	(0.0027)	(0.0038)	(0.0042)	(0.0080)	(0.0105)	(0.0139)
GEGO_MA	0.0064	0.0075	0.0007	0.0192	0.0225	0.0076
	(0.0032)	(0.0045)	(0.0055)	(0.0091)	(0.0121)	(0.0164)

The samples included reflect 50 (all), 17 (developed), and 30 (emerging) countries detailed in the data appendix. The dependent variables are either the 5-year average growth rate of real per capita gross domestic product or investment in excess of the total world counterpart. We include in the regressions, but do not report, fixed effects. In Panel A, we measure excess local growth opportunities as LEGO, the difference between local and exogenous growth opportunities (LGO-GGO). For the full sample and the emerging markets, these regressions are unbalanced based on data availability. In Panel B, we measure excess exogenous growth opportunities as GEGO, the difference between exogenous and total world growth opportunities (GGO-WGO). We report the coefficient on the lagged growth opportunities measure. The weighting matrix we employ in our GMM estimation provides a correction for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Table 8

Exploiting Growth Opportunities and Market Integration

Annual Average Excess Real GDP and Investment Growth (Five-year horizon)

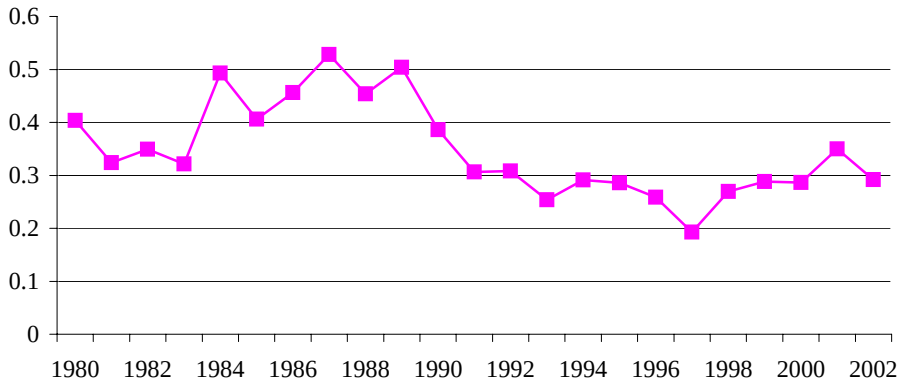
Sample I (50 countries): 1980-2002

Panel A: Capital Account Openness					
	GDP	Investment		GDP	Investment
LEGO_MA	0.0019	0.0160	GEGO_MA	0.0032	0.0044
	(0.0013)	(0.0033)		(0.0041)	(0.0124)
LEGO_MA*Capital Account Openness (IMF)	-0.0019	-0.0189	GEGO_MA*Capital Account Openness (IMF)	0.0080	0.0324
	(0.0016)	(0.0056)		(0.0065)	(0.0183)
LEGO_MA	0.0056	0.0502	GEGO_MA	-0.0051	-0.0153
	(0.0034)	(0.0146)		(0.0086)	(0.0275)
LEGO_MA*Capital Account Degree of Openness (Quinn)	-0.0051	-0.0530	GEGO_MA*Capital Account Degree of Openness (Quinn)	0.0181	0.0481
	(0.0039)	(0.0174)		(0.0122)	(0.0363)
Panel B: Equity Market Openness					
LEGO_MA	-0.0029	-0.0165	GEGO_MA	-0.0059	-0.0001
	(0.0081)	(0.0248)		(0.0058)	(0.0177)
LEGO_MA*Official Equity Market Liberalization	0.0040	0.0227	GEGO_MA*Official Equity Market Liberalization	0.0196	0.0278
	(0.0082)	(0.0250)		(0.0069)	(0.0206)
LEGO_MA	-0.0003	0.0194	GEGO_MA	-0.0029	-0.0035
	(0.0033)	(0.0147)		(0.0060)	(0.0203)
LEGO_MA*Equity Market Degree of Openness	0.0015	-0.0158	GEGO_MA*Equity Market Degree of Openness	0.0160	0.0319
	(0.0036)	(0.0156)		(0.0074)	(0.0242)
Panel C: Banking Sector Openness					
LEGO_MA	0.0023	0.0172	GEGO_MA	0.0005	0.0031
	(0.0020)	(0.0107)		(0.0065)	(0.0172)
LEGO_MA*Banking Sector Liberalization	-0.0009	-0.0182	GEGO_MA*Banking Sector Liberalization	0.0121	0.0252
	(0.0023)	(0.0040)		(0.0075)	(0.0208)
LEGO_MA	0.0028	0.0342	GEGO_MA	-0.0088	-0.0286
	(0.0038)	(0.0121)		(0.0076)	(0.0200)
LEGO_MA*Banking Sector Liberalization (First Sign)	-0.0007	-0.0294	GEGO_MA*Banking Sector Liberalization (First Sign)	0.0221	0.0616
	(0.0040)	(0.0127)		(0.0084)	(0.0227)

This sample includes 50 developed and emerging countries detailed in the data appendix. The dependent variables are either the 5-year average growth rate of real per capita gross domestic product or investment in excess of the total world counterpart. We include in the regressions, but do not report, fixed effects. We measure excess exogenous growth opportunities as GEGO_MA, the difference between exogenous and total world growth opportunities (GGO_MA-WGO_MA). We report the coefficient on the growth opportunities measure and interaction terms with 1) a 0/1 indicator of capital account openness from the IMF, 2) a continuous measure of the degree of capital account openness from Quinn (only 48 countries are available), 3) official equity market liberalization from Bekaert, Harvey and Lundblad (2004), 4) the degree of equity market openness (investability), and 5) two indicators of banking sector liberalalization -- opening the banking sector to foreign banks (give data limitations, this regression covers only 41 countries).

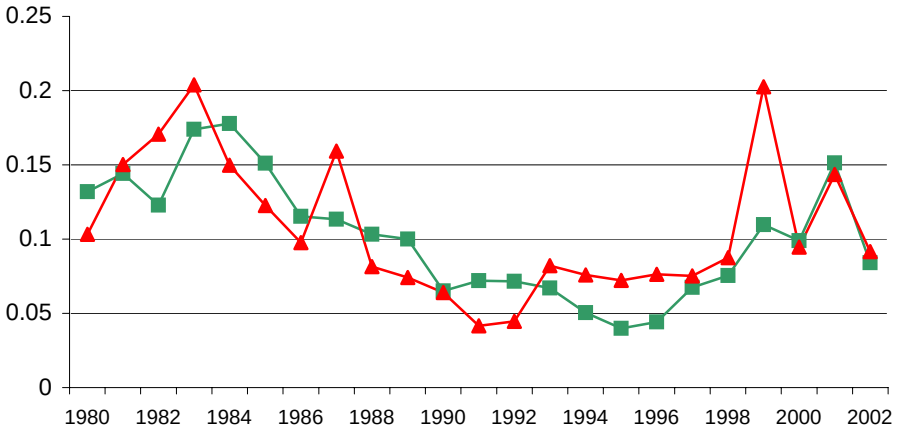
The weighting matrix we employ in our GMM estimation provides a correction for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Figure 1: Sample Average of Abs. Value of LEGO (■):
Developed Countries
1980-2002



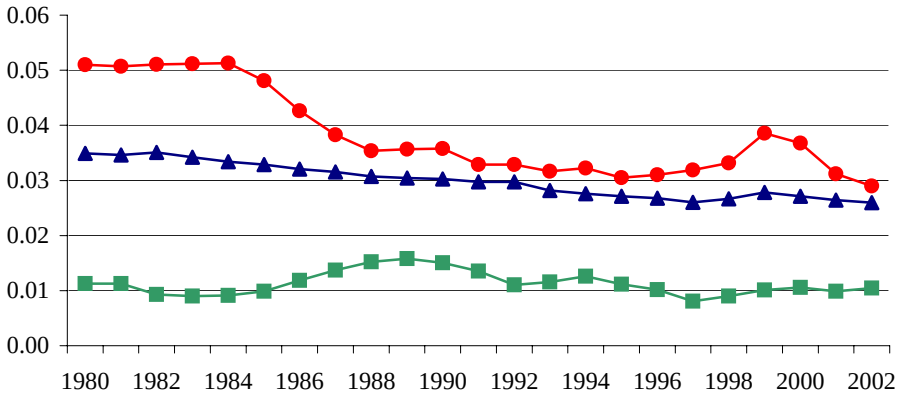
The graph shows the cross-sectional average of the December value of the absolute value of LEGO for each year between 1980 and 2002.

Figure 2: Sample Average of Absolute Value of GEGO:
Developed Countries (■), Emerging Countries (▲) 1980-2002



For each sample, the graph shows the cross-sectional average of the absolute value of GEGO for each year between 1980 and 2002.

Figure 3: Average Absolute Difference btw. Local and Global Industry Weights: Developed Countries (▲), Austria (●), USA (■) - 1980 - 2002



For each country, the average absolute value of the differences between the country-specific industry weights (based on relative market capitalization) and the world industry weights is calculated across all 35 industries each year. For the sample of developed countries, the graph shows the average value across countries.

Appendix Table A1

Sample Composition and Data Sources

Sample Composition			LGO: Sources and Availability of PE			GGO: Sources and Availability of Industry Weights (IW)		
Sample	Country	Code	**Datastream:** available since	**IFC:** available since	**MSCI:** available since	**Datastream:** Annual IW start in	**IFC:** Annual IW start in	**UNIDO:** Annual IW start in
-	World	-	**Jan-73**			-	-	-
I, III	Argentina	ARG	**Jul-91**				**1984**	**1983**
I, II	Australia	AUS	**Jan-73**			1973		**1973**
I, II	Austria	AUT	**Jan-73**			1973		**1973**
I, III	Bangladesh	BGD		Jan-96			**1996**	**1973**
I, II	Belgium	BEL	**Jan-73**			1973		**1973**
I, III	Brazil	BRA	**May-99**				**1983**	**1990**
I, II	Canada	CAN	**Jan-73**			1973		**1973**
I, III	Chile	CHL	**Jul-89**				**1975**	**1973**
I, III	Colombia	COL	**Feb-93**				**1984**	**1973**
I, III	Cote d'Ivoire	CIV		Jan-96			**1996**	**1973**
I, II	Denmark	DNK	**Jan-73**			1973		**1973**
I, III	Egypt	EGY		Jan-96			**1996**	**1973**
I	Finland	FIN	**Mar-88**			1988		**1973**
I, II	France	FRA	**Jan-73**			1973		**1973**
I, II	Germany	DEU	**Jan-73**			1973		**1973**
I, III	Greece	GRC	**Jan-90**				**1975**	**1973**
I, III	India	IND	**Jan-90**				**1975**	**1973**
I, III	Indonesia	IDN	**Jan-91**				**1989**	**1973**
I, II	Ireland	IRL	**Jan-73**			1973		**1973**
I, III	Israel	ISR	**Jan-93**				**1997**	**1973**
I	Italy	ITA			Apr-84	1973		**1973**
I, III	Jamaica	JAM		Jan-96			**1996**	**1973**
I, II	Japan	JPN	**Jan-73**			1973		**1973**
I, III	Jordan	JOR		Jul-86			**1979**	**1973**
I, III	Kenya	KEN		Jan-96			**1996**	**1973**
I, III	Korea, South	KOR	**Jan-88**				**1975**	**1973**
I, III	Malaysia	MYS	**Jan-86**				**1984**	**1973**
I, III	Mexico	MEX	**Jul-90**				**1975**	**1973**
I, III	Morocco	MAR		Jan-96			**1996**	**1973**
I, II	Netherlands	NLD	**Jan-73**			1973		**1973**
I	New Zealand	NZL	**Jan-88**			1988		**1973**
I, III	Nigeria	NGA		Sep-86			**1984**	**1973**
I, II	Norway	NOR			Jan-73	1980		**1973**
I, III	Pakistan	PAK		Apr-86			**1984**	**1973**
I, III	Philippines	PHL	**Sep-87**				**1984**	**1973**
I, III	Portugal	PRT	**Jan-90**				**1986**	**1973**
I, II	Singapore	SGP	**Jan-73**			1973		**1973**
I, II, III	South Africa	ZAF	**Jan-73**			1992		**1973**
I	Spain	ESP			Jan-80	1987		**1973**
I, III	Sri Lanka	LKA		Jan-93			**1992**	**1973**
I, II	Sweden	SWE			Jan-73	1982		**1973**
I, II	Switzerland	CHE	**Jan-73**			1973		**1986**
I, III	Thailand	THA	**Jan-87**				**1976**	**1973**
I, III	Trinidad and Tobago	TTO		Jan-96			**1996**	**1973**
I, III	Tunisia	TUN		Jan-96			**1996**	**1973**
I, III	Turkey	TUR	**Apr-90**				**1986**	**1973**
I, II	United Kingdom	GBR	**Jan-73**			1973		**1973**
I, II	United States	USA	**Jan-73**			1973		**1973**
I, III	Venezuela	VEN	**Mar-92**				**1984**	**1973**
I, III	Zimbabwe	ZWE		Jan-86			**1975**	**1973**

For the construction of LGO, market PE ratios from Datastream (preferred source), IFC, and MSCI are used. The table shows which source is used and the first month for which data are available. For the construction of GGO, industry weights (IW) are obtained from IFC (preferred source) and Datastream. The table reports which source is used and since which year market values are available. For the construction of GGO (VA), industry weights (IW) are obtained from UNIDO Industrial Statistics Database. The table reports since which year market values are available.

Appendix Table A2

Dating Liberalization

Country	*Official Equity Market Liberalization Year*	*Banking Liberalization Year*	*Banking Liberalization "First Sign" Year*
Argentina (ARG)	1989	1980 - 1983, 1994	1980 - 1983, 1994
Bangladesh (BGD)	1991	n/a	n/a
Brazil (BRA)	1991	1995	1995
Chile (CHL)	1992	1998	1998
Colombia (COL)	1991	1990	1990
Cote d'Voire (CIV)	1995	n/a	n/a
Egypt (EGY)	1992	1993	1993
Greece (GRC)	1987	1992	1987
India (IND)	1992	closed	1992
Indonesia (IDN)	1989	1999	1988
Israel (ISR)	1993	open	open
Jamaica (JAM)	1991	n/a	n/a
Japan (JPN)	1983	1985	1985
Jordan (JOR)	1995	n/a	n/a
Kenya (KEN)	1995	open	open
Korea (KOR)	1992	1998	1982
Malaysia (MYS)	1988	closed	closed
Mexico (MEX)	1989	1994	1991
Morocco (MAR)	1988	n/a	n/a
New Zealand (NZL)	1987	1987	1987
Nigeria (NGA)	1995	n/a	n/a
Pakistan (PAK)	1991	closed	1994
Philippines (PHL)	1991	2000	1994
Portugal (PRT)	1986	1984	1984
South Africa (ZAF)	1996	open	open
Spain (ESP)	1985	open	open
Sri Lanka (LKA)	1991	1998	1988
Thailand (THA)	1987	closed	1997
Trinidad & Tobago (TTO)	1997	n/a	n/a
Tunisia (TUN)	1995	n/a	n/a
Turkey (TUR)	1989	open	open
Venezuela (VEN)	1990	1994	1994
Zimbabwe (ZWE)	1993	n/a	n/a

The official equity market liberalization dates are based on Bekaert and Harvey (2002). Banking Liberalization dates and "First Sign" dates are defined in Table 2. Note that foreign banks could not enter the Argentinean banking market between 1984 and 1993. n/a indicates information for the country is not available. All other countries are considered fully liberalized from 1980-2002.