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Global Growth Opportunities and Market Integration

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ABSTRACT

We propose an exogenous measure of a country's growth opportunities by interacting the country's local industry mix with global price to earnings (*PE*) ratios. We find that these exogenous growth opportunities 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. We also find that financial development, external finance dependence, and investor protection measures are much less important in aligning growth opportunities with growth than is capital market openness. Finally, we formulate new tests of market integration and segmentation by linking local and global *PE* ratios to relative economic growth.

IN A PERFECTLY INTEGRATED WORLD economy, capital should be invested where it is expected 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) find a home bias in real investments. In particular, they show 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 toward 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 to 1997 period, both for the OECD countries and a group of mid-income emerging countries. In addition, research documents a home bias in trade, whereby even controlling for

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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]

Although 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 capital asset pricing model (CAPM) cannot be rejected in almost all developed country equity markets (with Japan as the exception). For emerging markets, Bekaert and Harvey (1995, 2000) provide sharper evidence against the hypothesis of global equity market integration.

The benefits of increasing globalization are now being questioned even though its welfare benefits may be large (see Lewis (1999) for the latter and Rodrik (1998) and Stiglitz (2000) for the former). We add a new perspective to this literature. Our research proposes a simple measure of country-specific growth opportunities based on two rather noncontroversial assumptions. First, the growth potential of a country is largely reflected in the growth potential of its mix of industries. Second, price to earnings (*PE*) ratios contain information about growth opportunities. If markets are globally integrated, we can measure a country's growth opportunities by using the *PE* ratios of global industry portfolios weighted by the country's industrial mix. 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 opportunities 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 (2005), which examines the effect of equity market liberalization on economic 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 opportunities measure to be useful, it must actually predict growth. That is, countries that happen to have a high concentration of high *PE* industries (measured by global *PE*s) should grow faster than average. We find that they do.

Second, our framework can be employed to shed new light on the links among financial development, capital allocation, and growth (see Levine (2004) for a survey). Research by Rajan and Zingales (1998), Wurgler (2000), and La Porta et al. (2000) stresses the role of financial development in relaxing external finance constraints and improved investor protection as the critical growth channels. However, recent work by Fisman and Love (2004a, 2004b) suggests

[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).

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 investigate the degree to which financial openness is important for aligning growth opportunities with growth. If financial openness is effective, countries that have liberalized their capital accounts, equity markets, and/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 research on price-based variables. When growth opportunities are competitively priced and exploited in internationally integrated markets, industry *PE*s 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* ratios should predict future real GDP growth relative to world growth. Conversely, the difference between a country's global and local *PE* ratios should not predict growth in excess of world growth. We investigate how these integration tests depend on measured degrees of financial openness, and thus examine the link between de facto and de jure integration (see also Aizenman and Noy (2005), Bekaert (1995)).

The remainder of the paper is organized as follows. Section I motivates our growth opportunities measure using a simple present value model, details its construction and its link with market integration, and provides some summary statistics. Section II investigates whether our growth opportunities measures indeed predict GDP and investment growth, contrasting the predictive performance of local and global measures. In Section III, we compare the different roles of financial openness, financial development, external finance dependence, investor protection, and political risk in aligning growth opportunities with growth. Section IV formulates and conducts our test of market integration. We offer concluding remarks in Section V.

I. Measuring Growth Opportunities

A. Growth Opportunities, Market Integration, and Economic Growth

Holding a number of factors such as risk constant, higher *PE* ratios indicate high growth opportunities. 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, Brown, and Klapper (2003)). Fisman and Love (2004a) 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.

Economic integration implies that industry growth opportunities share a common component across countries. Therefore, one source of local GDP growth

relative to world GDP growth is the weighting of industries within a particular country. If all available growth opportunities are competitively priced and exploited in world capital markets, a country's *PE* ratio for a particular industry should be correlated with its world counterpart. We build on this intuition to formally derive an exogenous measure of a country's growth opportunities. The model implies that a country with a large concentration in high *PE* (high growth opportunity) industries should grow faster than the world.

Let (logarithmic) earnings growth be denoted by $\Delta\ln(Earn_t)$ and let countries and industries be indexed by i and j, respectively. Assume

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

where $GO_{w,j,t-1}$ represents the stochastic growth opportunities for each industry j that do not depend on the country to which the industry belongs, and $\epsilon_{i,j,t}$ is a country- and industry-specific earnings growth disturbance. Because $\epsilon_{i,j,t}$ has no persistence, it is not priced. The assumption in equation (1) is strong and goes beyond financial market integration. Essentially, we assume economic integration to imply that industry earnings growth processes share a common component across countries and that only this component is persistent and priced. The idea that common global shocks, for example, of a technological nature, are dominant drivers of an industry's growth opportunities is also present in Rajan and Zingales (1998) and Fisman and Love (2004b). It is conceivable, however, that nontradable and regulated sectors in financially and even reasonably economically integrated countries still face priced country-specific growth opportunities. We investigate this possibility in Section II.B. It is also conceivable that country-specific factors induce near permanently higher factor productivity leading to both higher *PE* ratios and higher growth. While the current formulation does not accommodate this possibility, fixed effects in the empirical specification absorb such cross-country differences in growth potential.

Similarly, imperfections in goods markets that arise through trade restrictions, taxes, and market power or labor market frictions may lead to exploitable local growth opportunities. Conversely, even when financial markets are closed, foreign direct investment (FDI) flows may induce common components in earnings growth across countries.

As would be true in a financially integrated market, the discount rate process for each industry j in country i, $\delta_{i,j,t}$, is an affine function of the world discount rate, $\delta_{w,t}$, that is,

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

where $\beta_{i,j}$ represents the exposure to systematic risk for industry j in country i and r_f is the risk-free rate, which is assumed constant over time. Suppose that industry systematic risk is the same across integrated countries, or

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

Of course, this assumption does 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 derives (in closed-form) the *PE* ratio as an infinite sum of exponentiated affine functions of the current realizations of the growth opportunities (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 equation (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 that of the world. These assumptions also imply that industry *PE* ratios are similar across countries as they are determined primarily by global factors.[3]

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. This is not true, however, when markets are not fully integrated and growth opportunities are priced locally rather than globally. Thus, 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*) as

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

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

Under the null of integrated markets, *LGO* and *GGO* reflect the same information and hence should both predict economic growth in country i. Furthermore, the difference between the two measures, which we refer to as local excess growth opportunities (*LEGO*), should be constant and therefore should have no predictive power for relative economic growth. If, however, markets are not fully integrated, *LGO* and *GGO* will display different temporal behavior and *LEGO* should predict economic growth in country i in excess of world economic growth. Here, under our auxiliary assumptions, the hypothesis of no predictability constitutes a market integration hypothesis.

[3] 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.

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. Define the difference between *GGO* and its world counterpart (*WGO*) as

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

where

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

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, however, 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. Thus, predictive regressions of future relative economic growth onto *GEGO* allow us to also test the hypothesis of market segmentation. Table I summarizes the proposed measures of growth opportunities as well as their abilities to predict economic growth under different assumptions.

B. Constructing the Growth Opportunities Measures

We construct the measures of growth opportunities discussed above for a sample of 50 countries, which we list in Appendix Table AI.

We approximate *LGO* with the log of the market *PE* ratio of a given country. We use monthly *PE* ratios from Datastream as our primary source. A few countries in our sample are not covered by Datastream; in these instances we use *PE* ratios from Standard & Poor's Emerging Markets Data Base (EMDB) instead. For Italy, Norway, Spain, and Sweden, we use *PE* ratios from Morgan Stanley Capital International (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 monthly global industry *PE* ratios for 35 industrial sectors with 101 subsectors from Datastream. We construct two alternative sets of annual country-specific industry weights. The first uses equity market capitalization lagged 1 year,[4] and the second uses a measure of value added to construct relative weights. Most of the results in the paper are based on the market capitalization weights. For 21 of our 50 countries, our measure simply

[4] Note that the weights in *LGO* are not lagged. While our results are robust to the use of lagged weights, the use of lagged weights in *LGO* also implies the use of local industry-specific *PE* ratios, which often take on extreme values.

Table I
Predictive Power of Growth Opportunities Measures in Integrated and Segmented Markets

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

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 independent from the degree of market integration.	
GGO is a global measure of growth opportunities, that is, country-specific growth opportunities implied by the global market. *GOG* is the weighted sum of global industry *PE* ratios. The weights are determined by relative market capitalization or relative value added (*VA*). It is expressed in logs.	*GGO* predicts economic growth, since *LGO* and *GGO* move closely together.	*GGO* does not predict economic growth, since global *PE* ratios are not relevant for local markets.
LEGO is a local measure of country-specific growth opportunities in excess of global growth opportunities. *LEGO* is the difference between *LGO* and *GGO*.	*LEGO* does not predict economic growth in excess of world growth.	*LEGO* predicts economic growth in excess of world economic growth. Local and global *PE* ratios 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 *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 *PE* ratios are not relevant for local markets.

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 SIC industry groups employed by EMDB to determine a vector of industry weights. We then match the local weights for these SIC industry groups with the Datastream price to

earnings ratios by linking the Datastream subsectors to the corresponding local market industry structure.[5] Note that the use of lagged market capitalization weights implies that the GGO measure does not add up to the market *PE* ratios as usually defined by most data sets. These measures typically divide aggregate market capitalization by aggregate earnings, which amounts to using current earnings to weight industry-specific *PE* ratios. Unfortunately, such weights are too erratic to be of much use. We also use lagged market capitalization to weight earnings yields and then invert the weighted sum to obtain a *PE* measure. All of our results are robust to this alternative weighting scheme.

As a robustness check, we present results based on the alternative value-added weighting. We obtain 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 determined by the industry-specific value added relative to the total value added of the manufacturing sector in that country. We again match the Datastream price to earnings ratios to the 28 manufacturing industries used by UNIDO.[6]

Finally, we construct *WGO* in the same way as *GGO*, using global industry *PE* ratios and lagged global industry market capitalization data from Datastream. Appendix B provides more detail about the construction of all measures of growth opportunities.

Because our tests may have low power when discount rate changes dominate the variation of the *PE* ratios, we create an alternative measure by removing a 60-month moving average (*MA*) 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 driven by discount rate changes if discount rates are more persistent than growth opportunities, for which there is some empirical evidence. We calculate *GGO_MA*, *LEGO_MA*, and *GEGO_MA* analogously.

Although some of our growth opportunities 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 opportunities 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 II provides a summary of the construction of all the variables and the data sources.

[5] An alternative way to merge the two industry classifications is to link the SIC industry structure used by EMDB to the 35 Datastream industry sectors to create a uniform vector of weights across all countries in our sample. This alternative method yields very similar growth opportunities measures.

[6] 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.

Table II
Description of the Variables

Table II describes all variables used in the paper. 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 price to earnings ratio. *LGO_MA* is *LGO* less a 60-month moving average. For sample II (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's 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 determined by relative equity market capitalization. We also investigate an alternative set of weights based on the relative value added (VA) of the manufacturing 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's 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 global growth opportunities. *LEGO* is the difference between *LGO* and *GGO*. *LEGO_MA* is *LEGO* less a 60-month moving average. For sample II (17 developed countries) both variables are available from 1980 through 2002. For other countries, starting points vary. See Appendix B for details. *Source*: Datastream, S&P's 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 its world counterpart (*WGO*). *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's Emerging Markets Data Base
GGO_MA (unregulated industries) and *GGO_MA* (tradable industries)	In Appendix Table AIII, we define certain industries as likely regulated or nontradable. In the construction of *GGO_MA* (unregulated industries) and *GGO_MA* (tradable industries), we omit those industries, while renormalizing the equity market-based weights of the included industries appropriately. *Source*: Datastream, S&P's Emerging Markets Data Base
Share of unregulated industries	The share of unregulated industries represents the equity market capitalization of those industries that we do not classify as regulated (see Appendix Table AIII for details) relative to total equity market capitalization. *Source*: Datastream, S&P's Emerging Markets Data Base
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

(*continued*)

Table II—*Continued*

Variable	Description
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
SOE economic activity/GDP	Economic activity of state-owned enterprises (SOE) divided by GDP is the value added accounted for by state-owned enterprises relative to GDP. The variable is available for 34 countries. *Source*: World Bank Development Indicators CD-ROM
SOE employment/total employment	Employment by state-owned enterprises (SOE) divided by total employment is the number of full-time state enterprise employees relative to total formal sector employment. The variable is available for 17 countries. *Source*: World Bank Development Indicators CD-ROM
External finance dependence	Rajan and Zingales (1998) use U.S. firm-level data from the 1980s to construct a time-invariant industry-specific measure of external finance dependence based on the amount of investments not financed internally. Using time-varying country-specific industry weights, we combine their data to form a measure of aggregate external finance dependence for each year between 1980 and 2002 and each country in our sample.
	Measures of Openness
IMF capital account openness indicator	We measure capital account openness by employing 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 a 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 openness indicator	Quinn's (1997) 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 value of zero 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 facilitates a more nuanced view of capital account openness, and is available for 48 countries in our study. We transform the measure to a 0 to 1 scale.
Official equity market openness indicator	Corresponding to a date of formal regulatory change after which foreign investors officially have the opportunity to invest in domestic equity securities. Official openness dates are based on Bekaert and Harvey's (2005) *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

(*continued*)

Table II—*Continued*

Variable	Description
	version of the chronology, along with the selection of dates for a number of countries appears in Bekaert and Harvey (2000). We extend their official openness dates to include Japan, New Zealand, and Spain. For the liberalizing countries, the associated official openness indicator takes a value of one when the equity market is officially liberalized 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 AII.
Intensity equity market openness 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 Standard & Poor's/International Finance Corporation Investable (S&P/IFCI) index to those that comprise the Standard & Poor's/International Finance Corporation Global (S&P/IFCG) index for each country. The global index, subject to some exclusion restrictions, is designed to represent the overall market portfolio for each country, whereas the 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 openness indicator	Using a variety of sources (e.g., National Treatment Study, Fitch Ratings Country Reports, interviews with local regulatory bodies), we determine in which years foreign banks have access to the domestic banking market through the establishment of branches or subsidiaries or through the acquisition of local banks. Unless foreign banks are allowed to enter a local market, we consider a country closed with respect to foreign banks, yielding a foreign banking openness indicator equal to zero. The indicator is equal to one if foreign banks have access to a local market. 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 openness dates appear in Appendix Table AII.
	Financial Development and Political Risk
Equity market turnover	The ratio of equity market value traded to the market capitalization. The variable is available for 50 countries from 1980 through 2002. *Source*: S&P's Emerging Markets Data Base
ADR	ADR represents the proportion of equity market capitalization represented by firms that cross list, issue ADRs or GDRs, or raise capital in international markets relative to total equity market capitalization. The variable is available from 1989. *Source*: Levine and Schmukler (2003)

(*continued*)

Table II—*Continued*

Variable	Description
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 nonequity 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 size	The ratio of equity market value capitalization to GDP. The variable is available for 50 countries from 1980 through 2002. *Source*: S&P's Emerging Markets Data Base
Quality of Institutions	The sum of the *International Country Risk Guide* (ICRG) Political Risk subcomponents: Corruption, Law and Order, and Bureaucratic Quality. *Source*: Various issues of the *International Country Risk Guide*
Law and Order	ICRG political risk subcomponent. ICRG assesses Law and Order separately, with each subcomponent comprising zero to three points. The Law subcomponent is an assessment of the strength and impartiality of the legal system, while the Order subcomponent 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. *Source*: Various issues of the *International Country Risk Guide*
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 political risk rating indicator, which ranges between 0 (high risk) and 100 (low risk). The risk rating is a combination of 12 sub-components. 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 subcomponent (12% weight). This is a measure of the government's attitude toward inward investment. The investment profile is determined by PRS's assessment of three subcomponents: (i) risk of expropriation or contract viability; (ii) payment delays; and (iii) repatriation of profits. Each subcomponent is scored on a scale from zero (very high risk) to four (very low risk). *Source*: Various issues of the *International Country Risk Guide*

C. Comparing the Growth Opportunities Measures

Table III contains summary statistics for our growth opportunities measures. Panel A presents summary statistics for our unadjusted growth opportunities measures, averaged over different country groups and on a per country basis. The measure of local growth opportunities, *LGO*, is based on local *PE* ratios. Not surprisingly, it exhibits substantial time-series variation.

Table III

Summary Statistics

Panel A presents summary statistics for the unadjusted growth opportunities measures, averaged over different country groups and on a per country basis between 1980 and 2002. *LGO* is the log of a country's market price to earnings ratio. Data are not available for all years, see Appendix Table AI for details. *GGO* is the log of the product of country-specific industry weights (reflecting the industry's relative market capitalization) and global industry *PE* ratios. *GGO* (*VA*) is the log of the product of country-specific industry weights (reflecting the industry's relative value added) and global industry *PE* ratios. Data are available for all years. *LEGO* is *LGO* - *GGO*. *GEGO* is *GGO* - *WGO*, the world counterpart to *GGO*. I, II, and III refer to samples of all 50, the 17 developed, and the 30 emerging economies, respectively. World refers to the global stock market index as covered by Datastream.

Panel A: *LGO*, *GGO*, *LEGO*, and *GEGO* (Annual Frequency)

		Mean					Standard Deviation				
Sample	Country	*LGO*	*GGO*	*GGO* (*VA*)	*LEGO*	*GEGO*	*LGO*	*GGO*	*GGO* (*VA*)	*LEGO*	*GEGO*
	World	2.986	–	–	–	–	0.313	–	–	–	–
I	All Countries	2.661	2.932	3.017	−0.339	−0.054	0.544	0.295	0.244	0.523	0.160
II	Developed	2.737	2.945	3.049	−0.208	−0.041	0.469	0.288	0.250	0.369	0.138
III	Emerging	2.543	2.911	2.992	−0.494	−0.075	0.583	0.298	0.233	0.599	0.165
I, III	Argentina	2.979	2.911	2.973	−0.142	−0.075	0.796	0.348	0.232	0.850	0.093
I, II	Australia	2.695	2.899	3.036	−0.203	−0.087	0.341	0.315	0.239	0.200	0.090
I, II	Austria	2.838	2.905	3.074	−0.068	−0.081	0.253	0.229	0.254	0.320	0.180
I, III	Bangladesh	2.470	3.031	3.004	−0.651	0.045	0.682	0.165	0.167	0.711	0.194
I, II	Belgium	2.513	2.940	3.042	−0.428	−0.046	0.303	0.222	0.246	0.182	0.194
I, III	Brazil	2.206	2.821	3.037	−0.963	−0.165	0.072	0.412	0.260	0.338	0.148
I, II	Canada	2.756	2.963	3.017	−0.207	−0.023	0.312	0.305	0.244	0.200	0.102
I, III	Chile	2.680	2.900	3.029	−0.381	−0.086	0.463	0.285	0.287	0.418	0.090
I, III	Colombia	2.109	2.847	2.998	−0.858	−0.139	0.567	0.248	0.224	0.555	0.141
I, III	Côte d'Ivoire	1.986	2.903	2.923	−1.152	−0.083	0.347	0.325	0.225	0.395	0.087
I, II	Denmark	2.722	3.059	3.023	−0.338	0.073	0.438	0.234	0.252	0.377	0.125
I, III	Egypt	2.209	2.973	3.023	−0.885	−0.013	0.377	0.221	0.197	0.418	0.151
I	Finland	2.626	3.077	3.044	−0.614	0.091	0.569	0.376	0.284	0.432	0.202
I, II	France	2.563	2.928	3.029	−0.366	−0.057	0.323	0.305	0.245	0.127	0.055
I, II	Germany	2.811	2.912	3.059	−0.101	−0.074	0.242	0.275	0.260	0.211	0.067
I, III	Greece	2.629	2.921	3.030	−0.446	−0.065	0.403	0.347	0.201	0.314	0.128
I, III	India	2.663	3.110	3.080	−0.530	0.124	0.623	0.248	0.231	0.613	0.142
I, III	Indonesia	2.740	3.002	3.036	−0.352	0.016	0.376	0.236	0.258	0.373	0.150
I, II	Ireland	2.473	2.913	3.057	−0.440	−0.073	0.429	0.270	0.287	0.258	0.155

Table III—*Continued*

Panel A: *LGO*, *GGO*, *LEGO*, and *GEGO* (Annual Frequency)

		Mean					Standard Deviation				
Sample	Country	*LGO*	*GGO*	*GGO* (*VA*)	*LEGO*	*GEGO*	*LGO*	*GGO*	*GGO* (*VA*)	*LEGO*	*GEGO*
I, III	Israel	1.842	2.972	3.073	−1.333	−0.014	1.053	0.298	0.249	1.172	0.064
I	Italy	3.193	2.908	3.072	0.180	−0.078	0.752	0.277	0.235	0.710	0.099
I, III	Jamaica	1.918	2.905	2.942	−1.221	−0.081	0.251	0.345	0.291	0.456	0.107
I, II	Japan	3.746	3.021	3.090	0.724	0.035	0.382	0.254	0.255	0.218	0.091
I, III	Jordan	2.651	2.819	2.891	−0.329	−0.167	0.245	0.335	0.242	0.256	0.193
I, III	Kenya	2.735	2.823	2.971	−0.107	−0.163	1.634	0.228	0.219	1.716	0.196
I, III	Korea, South	2.814	3.068	3.076	−0.382	0.082	0.464	0.282	0.247	0.460	0.100
I, III	Malaysia	2.985	2.910	3.047	−0.065	−0.076	0.306	0.291	0.285	0.268	0.122
I, III	Mexico	2.538	2.924	3.038	−0.605	−0.062	0.113	0.348	0.240	0.252	0.091
I, III	Morocco	2.671	2.992	2.962	−0.296	0.006	0.294	0.180	0.167	0.192	0.265
I, II	Netherlands	2.539	2.947	3.034	−0.407	−0.039	0.438	0.217	0.246	0.257	0.138
I	New Zealand	2.648	3.121	3.008	−0.488	0.135	0.316	0.179	0.238	0.245	0.231
I, III	Nigeria	2.134	2.884	3.040	−0.899	−0.102	0.362	0.296	0.244	0.377	0.100
I, II	Norway	2.578	2.855	3.036	−0.277	−0.131	0.616	0.340	0.247	0.499	0.109
I, III	Pakistan	2.529	2.942	2.997	−0.552	−0.044	0.547	0.322	0.214	0.547	0.064
I, III	Philippines	2.840	2.862	2.985	−0.209	−0.124	0.417	0.352	0.248	0.365	0.103
I, III	Portugal	2.803	2.908	3.018	−0.223	−0.078	0.287	0.276	0.198	0.277	0.111
I, II	Singapore	2.983	3.003	3.110	−0.020	0.017	0.248	0.316	0.306	0.374	0.114
I, II, III	South Africa	2.470	2.741	3.040	−0.271	−0.245	0.372	0.342	0.243	0.181	0.156
I	Spain	2.630	2.836	3.030	−0.206	−0.150	0.368	0.325	0.227	0.318	0.142
I, III	Sri Lanka	2.402	2.862	2.858	−0.583	−0.124	0.508	0.222	0.237	0.530	0.141
I, II	Sweden	2.733	3.041	3.067	−0.308	0.055	0.507	0.277	0.269	0.298	0.075
I, II	Switzerland	2.691	3.005	3.049	−0.313	0.019	0.311	0.278	0.243	0.220	0.121
I, III	Thailand	2.684	2.899	2.990	−0.351	−0.086	0.507	0.293	0.216	0.491	0.097
I, III	Trinidad and Tobago	2.686	2.796	2.877	−0.186	−0.190	0.142	0.287	0.259	0.217	0.178
I, III	Tunisia	2.536	2.851	2.980	−0.392	−0.135	0.358	0.238	0.211	0.434	0.202
I, III	Turkey	2.708	2.990	2.990	−0.304	0.004	0.516	0.271	0.242	0.481	0.260
I, II	United Kingdom	2.638	2.959	3.052	−0.321	−0.027	0.336	0.263	0.250	0.148	0.073
I, II	United States	2.777	2.976	3.046	−0.200	−0.010	0.393	0.345	0.252	0.136	0.064
I, III	Venezuela	2.823	2.899	2.936	−0.217	−0.087	0.354	0.275	0.260	0.411	0.110
I, III	Zimbabwe	1.927	2.852	3.033	−1.078	−0.134	0.519	0.321	0.218	0.505	0.166

Panel B presents summary statistics for the moving average adjusted growth opportunities measures, averaged over different country groups and on a per country basis between 1980 and 2002. *LGO_MA* is *LGO* less a 60-month moving average. Data are not available for all years, see Appendix Table AI for details. *GGO_MA* is *GGO* less a 60-month moving average. *GGO_MA* (*VA*) is *GGO* (*VA*) less a 60-month moving average. Data are available for all years. *LEGO_MA* is *LEGO* less a 60-month moving average. *GEGO_MA* is *GEGO* less a 60-month moving average. I, II, and III refer to samples of all 50, the 17 developed, and the 30 emerging economies, respectively. World refers to the global stock market index as covered by Datastream. * indicates that *LGO_MA* and *LEGO_MA* have no annual observations.

Panel B: *LGO_MA*, *GGO_MA*, *LEGO_MA*, and *GEGO_MA* (Annual Frequency)

		Mean					Standard Deviation				
Sample	Country	*LGO_MA*	*GGO_MA*	*GGO_MA* (*VA*)	*LEGO_MA*	*GEGO_MA*	*LGO_MA*	*GGO_MA*	*GGO_MA* (*VA*)	*LEGO_MA*	*GEGO_MA*
	World	0.093	–	–	–	–	0.197	–	–	–	–
I	All Countries	0.036	0.071	0.060	−0.016	−0.021	0.396	0.198	0.207	0.381	0.112
II	Developed	0.057	0.072	0.076	−0.016	−0.020	0.281	0.192	0.205	0.239	0.100
III	Emerging	−0.004	0.071	0.051	−0.022	−0.022	0.506	0.200	0.197	0.519	0.117
I, III	Argentina	−0.096	0.072	0.059	−0.077	−0.021	0.395	0.232	0.187	0.470	0.092
I, II	Australia	0.075	0.082	0.067	−0.007	−0.011	0.200	0.220	0.223	0.184	0.101
I, II	Austria	−0.049	0.045	0.070	−0.094	−0.047	0.246	0.190	0.229	0.309	0.134
I, III	Bangladesh	−0.438	0.030	0.003	−0.271	−0.062	0.178	0.161	0.177	0.289	0.097
I, II	Belgium	0.008	0.034	0.056	−0.026	−0.058	0.242	0.193	0.226	0.161	0.124
I, III	Brazil	−*	0.095	0.055	−*	0.002	−*	0.239	0.262	−*	0.127
I, II	Canada	0.081	0.086	0.073	−0.005	−0.007	0.272	0.238	0.213	0.217	0.110
I, III	Chile	0.070	0.084	0.073	0.068	−0.009	0.299	0.172	0.314	0.316	0.090
I, III	Colombia	−0.105	0.056	0.047	−0.107	−0.037	0.315	0.178	0.178	0.444	0.113
I, III	Côte d'Ivoire	−0.100	0.093	0.052	−0.050	0.001	0.015	0.173	0.158	0.272	0.084
I, II	Denmark	0.094	0.061	0.078	0.034	−0.032	0.337	0.166	0.169	0.354	0.083
I, III	Egypt	−0.402	0.055	0.025	−0.373	−0.037	0.004	0.181	0.199	0.299	0.102
I	Finland	0.227	0.102	0.082	0.104	0.009	0.487	0.242	0.229	0.401	0.174
I, II	France	0.086	0.086	0.073	0.000	−0.007	0.229	0.170	0.200	0.120	0.055
I, II	Germany	0.056	0.086	0.078	−0.030	−0.007	0.241	0.181	0.215	0.162	0.057
I, III	Greece	0.072	0.091	0.044	0.037	−0.002	0.458	0.246	0.191	0.261	0.137
I, III	India	−0.287	0.059	0.040	−0.288	−0.033	0.219	0.227	0.249	0.212	0.096
I, III	Indonesia	−0.288	0.057	0.066	−0.298	−0.036	0.279	0.213	0.229	0.370	0.075
I, II	Ireland	0.080	0.067	0.089	0.012	−0.025	0.270	0.204	0.166	0.200	0.136
I, III	Israel	−0.863	0.093	0.080	−0.981	0.001	0.630	0.185	0.187	0.819	0.066

(*continued*)

Table III—*Continued*

Panel B: *LGO_MA*, *GGO_MA*, *LEGO_MA*, and *GEGO_MA* (Annual Frequency)

		Mean					Standard Deviation				
Sample	Country	*LGO_MA*	*GGO_MA*	*GGO_MA (VA)*	*LEGO_MA*	*GEGO_MA*	*LGO_MA*	*GGO_MA*	*GGO_MA (VA)*	*LEGO_MA*	*GEGO_MA*
I	Italy	−0.054	0.086	0.062	−0.059	−0.007	0.912	0.193	0.225	0.871	0.084
I, III	Jamaica	0.130	0.086	0.047	0.319	−0.007	0.234	0.225	0.286	0.477	0.109
I, II	Japan	0.072	0.078	0.077	−0.006	−0.015	0.282	0.193	0.223	0.204	0.059
I, III	Jordan	0.074	0.073	0.055	0.092	−0.020	0.238	0.255	0.172	0.238	0.181
I, III	Kenya	2.108	0.049	0.065	2.264	−0.043	2.832	0.168	0.148	2.928	0.129
I, III	Korea, South	−0.100	0.091	0.060	−0.160	−0.002	0.509	0.183	0.228	0.374	0.093
I, III	Malaysia	−0.073	0.067	0.090	−0.077	−0.026	0.337	0.193	0.210	0.262	0.105
I, III	Mexico	0.090	0.094	0.060	0.041	0.002	0.135	0.180	0.241	0.266	0.072
I, III	Morocco	−0.409	0.003	0.029	−0.213	−0.090	0.072	0.185	0.157	0.034	0.142
I, II	Netherlands	0.084	0.030	0.077	0.055	−0.063	0.240	0.171	0.201	0.128	0.103
I	New Zealand	0.084	0.010	0.073	0.059	−0.082	0.243	0.199	0.179	0.193	0.120
I, III	Nigeria	0.158	0.065	0.034	0.154	−0.028	0.240	0.173	0.160	0.323	0.094
I, II	Norway	−0.054	0.081	0.077	−0.135	−0.012	0.565	0.213	0.227	0.538	0.097
I, III	Pakistan	0.101	0.091	0.023	0.030	−0.001	0.665	0.187	0.204	0.689	0.051
I, III	Philippines	0.079	0.093	0.072	0.038	0.000	0.444	0.187	0.198	0.412	0.096
I, III	Portugal	−0.016	0.076	0.042	−0.022	−0.017	0.389	0.186	0.190	0.391	0.090
I, II	Singapore	−0.031	0.082	0.103	−0.113	−0.010	0.252	0.218	0.207	0.245	0.094
I, II, III	South Africa	0.053	0.080	0.055	−0.027	−0.013	0.302	0.211	0.239	0.170	0.163
I	Spain	0.037	0.077	0.062	−0.049	−0.015	0.304	0.224	0.207	0.235	0.135
I, III	Sri Lanka	0.002	0.058	0.034	0.011	−0.035	0.589	0.146	0.147	0.749	0.100
I, II	Sweden	0.112	0.084	0.085	0.028	−0.009	0.357	0.201	0.229	0.246	0.059
I, II	Switzerland	0.088	0.081	0.075	0.007	−0.012	0.150	0.179	0.258	0.174	0.123
I, III	Thailand	0.000	0.083	0.043	−0.046	−0.009	0.596	0.206	0.160	0.548	0.096
I, III	Trinidad and Tobago	−0.111	0.061	0.070	0.049	−0.032	0.182	0.225	0.180	0.348	0.142
I, III	Tunisia	−0.285	0.072	0.040	−0.247	−0.021	0.063	0.199	0.229	0.257	0.158
I, III	Turkey	0.178	0.061	0.032	0.211	−0.032	0.455	0.288	0.231	0.451	0.196
I, II	United Kingdom	0.095	0.068	0.074	0.028	−0.025	0.181	0.164	0.194	0.117	0.064
I, II	United States	0.118	0.102	0.083	0.017	0.009	0.160	0.180	0.197	0.122	0.038
I, III	Venezuela	−0.024	0.082	0.052	−0.107	−0.011	0.323	0.200	0.236	0.430	0.094
I, III	Zimbabwe	0.060	0.061	0.042	0.039	−0.031	0.464	0.215	0.204	0.449	0.170

Panel C presents correlations between the different measures of local and global growth opportunities between 1980 and 2002. For a definiton of the different measures, please see Panel A and B. I, II, and III refer to samples of all 50, the 17 developed, and the 30 emerging economies, respectively. * indicates that *LGO_MA* has two or less annual observations.

Panel C: Correlations between Measures of Growth Opportunities (Annual Frequency)

		Growth Opportunities					Growth Opportunities with *MA*-Adjustment				
Sample	Country	*LGO*, *WGO*	*LGO*, *GGO*	*LGO*, *GGO* (*VA*)	*GGO*, *WGO*	*GGO*, *GGO* (*VA*)	*LGO*, *WGO*	*LGO*, *GGO*	*LGO*, *GGO* (*VA*)	*GGO*, *WGO*	*GGO*, *GGO* (*VA*)
I	All Countries	0.239	0.317	0.333	0.859	0.785	0.246	0.323	0.320	0.837	0.735
II	Developed	0.549	0.619	0.570	0.894	0.821	0.482	0.545	0.502	0.865	0.776
III	Emerging	0.037	0.109	0.092	0.851	0.779	0.011	0.117	0.117	0.824	0.732
I, III	Argentina	−0.245	−0.140	−0.096	0.966	0.906	0.000	0.046	0.061	0.921	0.793
I, II	Australia	0.810	0.818	0.698	0.959	0.886	0.517	0.622	0.543	0.889	0.834
I, II	Austria	−0.067	0.121	−0.021	0.824	0.737	−0.015	0.013	0.028	0.760	0.674
I, III	Bangladesh	−0.386	−0.097	0.316	0.847	0.817	−*	−*	−*	0.872	0.893
I, II	Belgium	0.789	0.802	0.750	0.790	0.839	0.690	0.749	0.572	0.798	0.806
I, III	Brazil	−0.740	−0.662	−0.745	0.953	0.650	−*	−*	−*	0.847	0.599
I, II	Canada	0.714	0.791	0.874	0.946	0.949	0.424	0.647	0.806	0.888	0.914
I, III	Chile	0.350	0.436	0.566	0.960	0.617	0.148	0.190	0.510	0.888	0.714
I, III	Colombia	−0.193	0.205	0.178	0.899	0.922	−0.600	−0.863	−0.733	0.822	0.857
I, III	Côte d'Ivoire	0.189	0.061	0.384	0.964	0.863	−*	−*	−*	0.905	0.626
I, II	Denmark	0.590	0.511	0.612	0.936	0.876	0.204	0.145	0.227	0.908	0.767
I, III	Egypt	0.527	−0.089	0.698	0.897	0.823	−*	−*	−*	0.859	0.847
I	Finland	0.820	0.654	0.587	0.844	0.854	0.836	0.570	0.526	0.704	0.774
I, II	France	0.889	0.920	0.859	0.985	0.915	0.783	0.860	0.721	0.965	0.870
I, II	Germany	0.659	0.675	0.741	0.982	0.908	0.714	0.740	0.775	0.958	0.844
I, III	Greece	0.669	0.640	0.450	0.930	0.780	0.781	0.920	0.787	0.832	0.640
I, III	India	0.188	0.219	0.301	0.897	0.889	0.442	0.548	0.645	0.907	0.933
I, III	Indonesia	−0.082	0.282	−0.006	0.888	0.901	−0.052	−0.001	−0.054	0.937	0.896
I, II	Ireland	0.897	0.823	0.901	0.869	0.812	0.682	0.676	0.691	0.772	0.712
I, III	Israel	−0.467	−0.603	−0.442	0.980	0.919	−0.652	−0.717	−0.585	0.942	0.815
I	Italy	0.261	0.364	0.495	0.951	0.793	0.234	0.327	0.556	0.907	0.745
I, III	Jamaica	−0.928	−0.911	−0.670	0.951	0.682	−*	−*	−*	0.875	0.608

(*continued*)

Table III—*Continued*

Panel C: Correlations between Measures of Growth Opportunities (Annual Frequency)

		Growth Opportunities					Growth Opportunities with *MA*-Adjustment				
Sample	Country	*LGO*, *WGO*	*LGO*, *GGO*	*LGO*, *GGO* (*VA*)	GGO, *WGO*	*GGO*, *GGO* (*VA*)	*LGO*, *WGO*	*LGO*, *GGO*	*LGO*, *GGO* (*VA*)	*GGO*, *WGO*	*GGO*, *GGO* (*VA*)
I, II	Japan	0.852	0.841	0.719	0.969	0.934	0.717	0.692	0.535	0.955	0.912
I, III	Jordan	0.378	0.258	0.522	0.825	0.791	0.097	0.287	0.384	0.706	0.591
I, III	Kenya	−0.457	−0.813	−0.691	0.782	0.802	−*	−*	−*	0.762	0.772
I, III	Korea, South	0.321	0.244	0.389	0.949	0.850	0.730	0.755	0.764	0.882	0.822
I, III	Malaysia	0.032	0.486	0.006	0.920	0.802	0.384	0.649	0.564	0.855	0.688
I, III	Mexico	−0.082	0.041	−0.407	0.967	0.714	−0.258	−0.134	−0.509	0.930	0.769
I, III	Morocco	0.438	0.889	0.664	0.536	0.692	−*	−*	−*	0.725	0.801
I, II	Netherlands	0.918	0.909	0.851	0.927	0.864	0.754	0.858	0.604	0.851	0.709
I	New Zealand	0.614	0.643	0.817	0.683	0.725	0.443	0.635	0.599	0.816	0.838
I, III	Nigeria	0.279	0.064	0.270	0.947	0.937	−0.362	−0.376	−0.329	0.878	0.852
I, II	Norway	0.568	0.589	0.658	0.948	0.811	0.342	0.309	0.357	0.891	0.705
I, III	Pakistan	0.173	0.211	0.305	0.980	0.736	0.067	0.057	0.440	0.966	0.750
I, III	Philippines	0.292	0.512	0.485	0.959	0.842	0.138	0.379	0.320	0.876	0.654
I, III	Portugal	0.294	0.330	0.068	0.937	0.819	0.117	0.202	0.004	0.890	0.788
I, II	Singapore	0.141	0.138	0.129	0.935	0.844	0.619	0.463	0.663	0.901	0.794
I, II, III	South Africa	0.665	0.874	0.654	0.890	0.778	0.386	0.838	0.518	0.684	0.788
I	Spain	0.656	0.586	0.406	0.902	0.734	0.710	0.653	0.614	0.803	0.526
I, III	Sri Lanka	−0.312	−0.010	−0.261	0.916	0.957	−0.656	−0.873	−0.909	0.869	0.833
I, II	Sweden	0.828	0.872	0.890	0.976	0.923	0.638	0.748	0.785	0.956	0.863
I, II	Switzerland	0.735	0.727	0.628	0.923	0.750	0.283	0.455	0.075	0.789	0.457
I, III	Thailand	0.235	0.259	0.440	0.951	0.897	0.313	0.414	0.471	0.887	0.808
I, III	Trinidad and Tobago	−0.472	−0.123	−0.284	0.828	0.783	−*	−*	−*	0.781	0.628
I, III	Tunisia	−0.212	−0.490	0.179	0.763	0.560	−*	−*	−*	0.679	0.424
I, III	Turkey	0.293	0.365	0.334	0.612	0.874	−0.056	0.203	0.161	0.735	0.903
I, II	United Kingdom	0.912	0.906	0.857	0.983	0.903	0.760	0.775	0.708	0.953	0.816
I, II	United States	0.882	0.940	0.841	0.986	0.913	0.673	0.747	0.653	0.984	0.821
I, III	Venezuela	−0.140	−0.135	−0.013	0.938	0.783	−0.337	−0.302	−0.320	0.887	0.676
I, III	Zimbabwe	0.269	0.244	−0.086	0.863	0.812	0.017	0.271	0.136	0.665	0.736

Panel D presents information on the number of local stocks used to determine a country's industry structure as well as on the three most important industries. For data from S&P's Emerging Markets Data Base (EMDB), we report the average number of stocks over the sample period. For the Datastream data, such detail is not available. For these markets, we report the approximate number of stocks per country as reported by Datastream. Datastream covers about 80 to 85% of the market capitalization. See Appendix Table AI for details. The industry composition information is based on the average industry weights (IW) over the sample period. The industries refer to the FTSE Global Classification System employed by Datastream.

Panel D: Industry Composition of Local Stock Markets

Sample	Country	Number of Stocks Used	Top 3 Industries Market Share	Industry 1	Industry 2	Industry 3
I	All Countries	5,832	0.598	–	–	–
II	Developed	4,370	0.538	–	–	–
III	Emerging	1,152	0.628	–	–	–
I, III	Argentina	25	0.723	Oil & Gas	Food Prod. & Proc.	Beverages
I, II	Australia	160	0.590	Mining	Banks	Construction & Build.
I, II	Austria	50	0.625	Insurance	Banks	Construction & Build.
I, III	Bangladesh	51	0.454	Hhold Goods & Textiles	Construction & Build.	Tobacco
I, II	Belgium	90	0.601	Electricity	Banks	Invest. Companies
I, III	Brazil	56	0.637	Banks	Oil & Gas	Mining
I, II	Canada	250	0.434	Oil & Gas	Banks	IT Hardware
I, III	Chile	33	0.575	Forestry & Paper	Food Prod. & Proc.	Electricity
I, III	Colombia	22	0.592	Banks	Construction & Build.	Beverages
I, III	Côte d'Ivoire	11	0.652	Food Prod. & Proc.	Banks	Tobacco
I, II	Denmark	50	0.595	Transport	Banks	Pharmaceuticals
I, III	Egypt	59	0.524	Construction & Build.	Banks	Real Estate
I	Finland	50	0.766	Health	IT Hardware	Forestry & Paper
I, II	France	200	0.326	Oil & Gas	Div. Industries	Construction & Build.
I, II	Germany	200	0.407	Banks	Insurance	Chemicals
I, III	Greece	30	0.784	Banks	Construction & Build.	Hhold Goods & Textiles
I, III	India	72	0.535	Hhold Goods & Textiles	Steel & Other Metals	Engineer. & Machinery
I, III	Indonesia	59	0.549	Construction & Build.	Banks	Tobacco
I, II	Ireland	50	0.776	Banks	Construction & Build.	Food Prod. & Proc.
I, III	Israel	49	0.670	Div. Industries	Banks	Chemicals

(*continued*)

Table III—*Continued*

Panel D: Industry Composition of Local Stock Markets

Sample	Country	Number of Stocks Used	Top 3 Industries Market Share	Industry 1	Industry 2	Industry 3
I	Italy	160	0.593	Insurance	Banks	Telecommunication
I, III	Jamaica	20	0.610	Banks	Media & Entertainment	Telecommunication
I, II	Japan	1,000	0.324	Banks	Electr. Equipment	Automobiles & Parts
I, III	Jordan	25	0.857	Banks	Oil & Gas	Mining
I, III	Kenya	17	0.623	Banks	Food Prod. & Proc.	Construction & Build.
I, III	Korea, South	87	0.462	Construction & Build.	Banks	Oil & Gas
I, III	Malaysia	87	0.587	Banks	Div. Industries	Food Prod. & Proc.
I, III	Mexico	49	0.525	Div. Industries	General Retailers	Construction & Build.
I, III	Morocco	17	0.621	Banks	Real Estate	Invest. Companies
I, II	Netherlands	130	0.580	Oil & Gas	Invest. Companies	Food Prod. & Proc.
I	New Zealand	50	0.662	Invest. Companies	Beverages	Telecommunication
I, III	Nigeria	23	0.555	Beverages	Food Prod. & Proc.	Banks
I, II	Norway	50	0.712	Oil & Gas	Transport	Engineer. & Machinery
I, III	Pakistan	56	0.429	Oil & Gas	Hhold Goods & Textiles	Electricity
I, III	Philippines	36	0.591	Mining	Food Prod. & Proc.	Beverages
I, III	Portugal	24	0.592	Banks	Div. Industries	Media & Entertainment
I, II	Singapore	100	0.607	Banks	Real Estate	Transport
I, II, III	South Africa	70	0.753	Mining	Div. Industries	Banks
I	Spain	120	0.689	Banks	Electricity	Telecommunication
I, III	Sri Lanka	42	0.550	Div. Industries	Banks	Food Prod. & Proc.
I, II	Sweden	70	0.576	IT Hardware	Banks	Engineer. & Machinery
I, II	Switzerland	350	0.622	Pharmaceuticals	Food Prod. & Proc.	Banks
I, III	Thailand	38	0.741	Banks	Construction & Build.	Speciality Finance
I, III	Trinidad and Tobago	11	0.836	Banks	Div. Industries	Construction & Build.
I, III	Tunisia	14	0.917	Banks	Speciality Finance	Support Services
I, III	Turkey	36	0.536	Banks	Steel & Other Metals	Automobiles & Parts
I, II	United Kingdom	550	0.324	Oil & Gas	Banks	Telecommunication
I, II	United States	1,000	0.289	Oil & Gas	IT Hardware	Telecommunication
I, III	Venezuela	15	0.681	Banks	Construction & Build.	Electricity
I, III	Zimbabwe	16	0.666	Mining	Food Prod. & Proc.	Div. Industries

It exhibits substantial cross-sectional variation as well, with values less than 2.0 for Zimbabwe, Jamaica, Israel, and Côte d'Ivoire, but higher than 3.0 for Italy and Japan. Our measure of exogenous growth opportunities, *GGO*, shows lower dispersion than *LGO*. When comparing the sample of developed countries to the emerging market sample, we find few differences in the means and standard deviations of *LGO* and *GGO*. The industry-weighted difference between information contained in local and global *PE* ratios, *LEGO*, 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 (−0.041 vs. −0.075), 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, where countries such as Kenya and Israel have very high standard deviations. The same statistics for the exogenous growth opportunities measure based on the value-added weights (*GGO*(*VA*)) produce similar findings.

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

Table III, Panel C presents correlations between the different unadjusted as well as adjusted measures of growth opportunities. In both cases, the correlations between *LGO* and *WGO* and between *LGO* and *GGO* are substantially higher for developed countries than for emerging market countries. For several countries, including Brazil, Israel, and Venezuela, the correlations are negative. The correlation between *GGO* and *WGO* 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. The final column reports the time-series correlation between our market capitalization-based measure of exogenous growth opportunities and the alternative measure that uses value-added weights. In the case of the unadjusted growth opportunities measure, the correlation is, on average, 0.79 and it never falls below 0.56. Tunisia has the lowest correlation.

Finally, Table III, Panel D reports the number of local stocks available to derive a country's industry structure as well as the main industries in each market. Our sample includes well-established stock markets in both the developed (United States, United Kingdom, Switzerland) and developing markets (South Africa, Malaysia) and vice versa. Because the level of stock market development may affect the representativeness of our industry weights for the whole economy, the robustness check using the value-added weights becomes even more important. The top three industries represent typically more than 50% of total market capitalization and in over 35% of the countries the banking

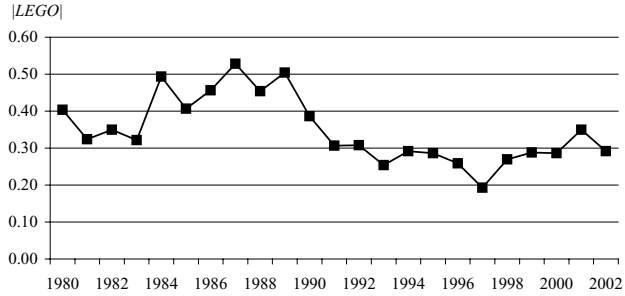

Figure 1. Sample average of absolute value of *LEGO*. The graph shows the cross-sectional average of the December value of the absolute value of *LEGO* for each year between 1980 and 2002 for developed countries. *LEGO* is the difference between local and exogenous growth opportunities (*LGO-GGO*).

sector is the top industry. The second-most prominent industry is oil and gas, finishing first in 15% of the cases.

To investigate a potential trend toward increased international integration over the past 20 years, Figure 1 shows the evolution of the average absolute value of *LEGO*, that is, the distance between *LGO* and *GGO* for the sample of developed countries. 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* on a (country-specific) constant and a time trend. We find a negative (-0.0076) and highly significant trend coefficient (standard error $= 0.0018$), confirming a reduction in the distance between *LGO* and *GGO* for our sample of developed countries.

While we expect local and global measures of growth opportunities to converge when countries become more integrated, we have no such prior with respect to *GEGO* (the difference between *GGO* and its world counterpart (*WGO*)).

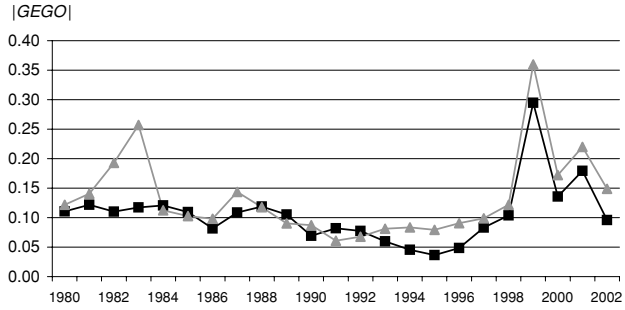

Figure 2. Sample average of absolute value of *GEGO*. For each sample, the graph shows the cross-sectional average of the absolute value of *GEGO* for each year between 1980 and 2002. ■ denotes developed countries, ▲ denotes emerging countries. *GEGO* is the differnce between exogenous and total world growth opportunities (*GGO-WGO*).

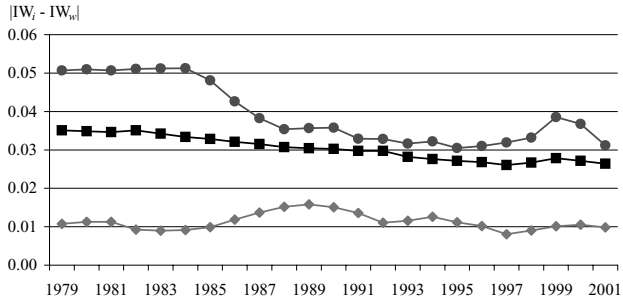

Figure 3. Average absolute difference between local and global industry weights. For each country, the average absolute value of the differences between the country-specific industry weights (based on relative market capitalization) and the world industry weights is calculated across all 35 industries for each year between 1979 and 2001. For the sample of developed countries, ■ denotes the average value across developed countries. ● denotes Austria and ♦ the U.S.

Figure 2 shows that for developed as well as emerging market countries, the average absolute value of *GEGO* seems to have decreased slightly over time up until about 1996.

One possible source of variation in *GEGO* is the changes in a country's industrial composition relative to the world over time. To explore this possibility 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.[7] 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 United States has remained stable. Given its economic weight in the world economy, this is not surprising, of course. Importantly, the figure 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, which explains cross-country growth differences.

II. Do Growth Opportunities Predict Growth?

A. *Econometric Framework*

The first regressions we consider are

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

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

[7] See Carrieri, Errunza, and Sarkissian (2004) for a similar result.

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.[8] Following convention in the growth literature, we employ $k = 5$ to minimize the influence of higher frequency business cycles in our sample. We maximize the time-series content of our estimates by using overlapping 5-year periods.

We include country-specific fixed effects, $\alpha_{i,0}$, consistent with the model in Section I, to capture cross-sectional heterogeneity and potentially omitted variables. Regressions (10) and (11) both test whether, indeed, our growth opportunities measures predict growth. In Sections II.B and II.C, we conduct these tests under the assumption that $\alpha_{i,1,t}$ is constant across time and across countries. However, the *GGO* measure should only predict growth in integrated markets. Therefore, in Section II.D we model the slope coefficient $\alpha_{i,1,t}$ as a linear function of various measures of openness, with the parameters constrained to be identical in the cross section. That is, we let

$$\alpha_{i,1,t} = \alpha + \beta Open_{i,t}, \tag{12}$$

where $Open_{i,t}$ indicates capital account, equity market, or banking sector openness. We employ the pooled time-series, cross-sectional (panel) generalized method of moments (GMM) estimator presented in Bekaert, Harvey, and Lundblad (2001), and we construct standard errors to account for cross-sectional heteroskedasticity and the overlapping nature of the growth shocks, $\eta_{i,t+k,k}$. While this estimator looks like an instrumental variable estimator, it reduces to pooled Ordinary Least Squares (OLS) under simplifying assumptions on the weighting matrix.

B. Local Growth Opportunities

Table IV, Panel A presents estimates for $\alpha_{i,1,t}$ in regression (10) for each of our three samples (fixed effects are not reported) for both GDP and investment growth. We use both *LGO* and *LGO_MA*. Unfortunately, the time-series history on local market *PE* ratios is limited (see Appendix Table AI); therefore, we report estimates for an unbalanced panel, maximizing the sample history for each country.

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 0.396 in *LGO_MA*, is associated with a 17 basis point and 60 basis point increase in annual output and investment growth, respectively. The estimated effect is somewhat more

[8] 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) model, 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.

Table IV
Growth Predictability Using Local Measures of Growth Opportunities

The samples included reflect 50 (all), 17 (developed), and 30 (emerging) countries between 1980 and 2002. 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, country fixed effects. We report the coefficient on the lagged growth opportunities measure. In Panel A, we measure local growth opportunities (*LGO*). For the full sample and the emerging markets, these regressions are unbalanced based on data availability. In Panel B, we interact *LGO* with country characteristics. The Share of Unregulated Industries represents the equity market capitalization of those industries that we classify as unregulated (see Appendix Table AIII for details) relative to total equity market capitalization. Turnover indicates the ratio of equity market value traded to the market capitalization and is from S&P's *Emerging Stock Markets Factbook*. *ADR* represents the market capitalization of "internationalized" firms relative to total equity market capitalization and is from Levine and Schmukler (2003). *N* denotes the number of country-years. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. * indicates statistical significance at the 5% level. All standard errors in parentheses account for the overlapping nature of the data.

Panel A: Local Growth Opportunities

	Annual Real GDP Growth (5-Year Horizon)			Annual Real Investment Growth (5-Year Horizon)		
	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)
N	551	306	211	551	306	211
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)
N	415	306	95	415	306	95

Panel B: Local Growth Opportunities and Country Characteristics (All Countries)

	Annual Real GDP Growth (5-Year Horizon)			Annual Real Investment Growth (5-Year Horizon)		
	Share of Unregulated Industries	Turnover	ADR (Starting in 1989)	Share of Unregulated Industries	Turnover	*ADR* (Starting in 1989)
LGO	−0.0028	0.0035*	0.0042*	−0.0059	0.0070	0.0104
	(0.0019)	(0.0013)	(0.0016)	(0.0064)	(0.0042)	(0.0054)
LGO × Country Characteristic	0.0105*	−0.0021*	−0.0051*	0.0198*	−0.0061*	−0.0135
	(0.0030)	(0.0009)	(0.0022)	(0.0099)	(0.0029)	(0.0072)
N	551	551	333	551	551	333

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, our sample histories are more

limited for emerging markets. Second, our tests may have less power for emerging markets because other factors such as political risk or structural changes (e.g., market reforms) may be relatively more important in driving *PE* ratios than growth opportunities. Finally, the stock markets in these countries are generally smaller and less representative of the total economy compared to those in developed markets.

To further explore the idea that country-specific stock market characteristics may affect the predictive impact of local *PE* ratios, we interact the *LGO* measures with several country-specific variables in Table IV, Panel B. For example, certain markets may have more regulated sectors, making the market's *PE* ratio less reflective of growth opportunities for these countries. When we interact the *LGO* measure with the proportion of the market capitalization accounted for by industries that are less likely subject to regulation (see Appendix Table AIII for details), we find a positive and significant interaction effect for the *LGO* measure but not for the *LGO_MA* measure. We also interact the *LGO* measure with equity market turnover, an indicator of the liquidity and perhaps efficiency of the local stock market, but do not find the expected positive interaction effect. Finally, the local *PE* ratios may represent a cross-sectional heterogeneous and time-varying mix of local and global prices because of the presence of ADRs. For example, ADRs have been more prevalent in Latin America than in Southeast Asia and ADRs were of much less importance earlier in the sample. Given that local prices partially reflect a corporate governance, segmentation, and illiquidity discount, while ADR prices do not, the total *PE* ratio may be not very informative about growth opportunities. We use the Levine and Schmukler (2003) measure of the degree of internationalization of different stock markets, namely, measured as the market capitalization of firms that cross list, issue ADRs or GDRs, or raise capital in international markets relative to total equity market capitalization.[9] Unfortunately, these data are only available as of 1989. When we interact the *LGO* measures with the ADR measure, the constant term in $\alpha_{i,1,t}$ is positive and significant but the interaction term is negative, albeit not always statistically significant. When we extend the Levine and Schmukler data on internationalization to the full sample using country-specific information in the trend toward internationalization, we find similar results (not reported).

We conclude that local *PE* ratios contain information about future growth opportunities, but their information content is limited for emerging markets, partially due to limitations in the data set and partially because local *PE* ratios are confounded by country-specific factors.

C. Global (Exogenous) Growth Opportunities

In Table V (first two lines), we test whether exogenous growth opportunities predict real GDP and investment growth. Recall that *GGO* and *GGO_MA* reflect the industrial composition within each country and the growth opportunities

[9] We thank Sergio Schmukler for making these data available to us.

Table V

Growth Predictability Using Global Measures of Growth Opportunities

The samples included reflect 50 (all), 17 (developed), 16 (EU plus Norway and Switzerland), and 30 (emerging) countries between 1980 and 2002. 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, country fixed effects. We report the coefficient on the lagged growth opportunities measure. In Panel A, we use the unadjusted as well as the moving average adjusted measure of global growth opportunities. In brackets, we report the minimum and maximum values from a robustness analysis in which we repeat our analysis 35 times, each time removing one industry from the weighting scheme. We also report evidence for the alternative value-added (VA) industry weights. In Panel B, we focus on those industries that we do not classify as regulated or nontradable (see Appendix Table AIII for details). We also interact *GGO_MA* with the value added of state-owned enterprises (SOE) relative to GDP. *N* denotes the number of country-years. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. * indicates statistical significance at the 5% level. All standard errors in parentheses account for the overlapping nature of the data.

Panel A: Exogenous (Implied) Global Growth Opportunities

	Annual Real GDP Growth (5-Year Horizon)				Annual Real Investment Growth (5-Year Horizon)			
	All Countries	Developed	EU Countries	Emerging	All Countries	Developed	EU Countries	Emerging
GGO	0.0070*	0.0033	0.0027	0.0131*	0.0408*	0.0211*	0.0203*	0.0704*
	(0.0019)	(0.0026)	(0.0032)	(0.0026)	(0.0060)	(0.0085)	(0.0093)	(0.0080)
	[0.0055, 0.0072]				[0.0358, 0.0408]			
GGO_MA	0.0142*	0.0163*	0.0191*	0.0106*	0.0397*	0.0489*	0.0568*	0.0223
	(0.0023)	(0.0031)	(0.0033)	(0.0035)	(0.0071)	(0.0102)	(0.0107)	(0.0112)
	[0.0119, 0.0147]				[0.0356, 0.0406]			
GGO (*VA*)	0.0081*	0.0061*	0.0068*	0.0117*	0.0347*	0.0252*	0.0284*	0.0552*
	(0.0017)	(0.0023)	(0.0027)	(0.0027)	(0.0055)	(0.0072)	(0.0075)	(0.0089)
GGO_MA (*VA*)	0.0101*	0.0114*	0.0123*	0.0056	0.0235*	0.0345*	0.0371*	0.0052
	(0.0018)	(0.0024)	(0.0017)	(0.0030)	(0.0056)	(0.0075)	(0.0056)	(0.0088)
N	900	306	288	540	900	306	288	540

Panel B: Global Growth Opportunities and Country Characteristics (All Countries)

	Annual Real GDP Growth (5-Year Horizon)			Annual Real Investment Growth (5-Year Horizon)		
	GGO_MA (Unregulated Industries)	*GGO_MA* (Tradable Industries)	SOE Economic Activity/GDP (34 Countries)	*GGO_MA* (Unregulated Industries)	*GGO_MA* (Tradable Industries)	SOE Economic Activity/GDP (34 Countries)
GGO_MA	0.0148*	0.0118*	0.0229*	0.0323*	0.0274*	0.0691*
	(0.0023)	(0.0021)	(0.0050)	(0.0077)	(0.0068)	(0.0191)
GGO_MA × Country Characteristic	–	–	−0.0526	–	–	−0.2462
			(0.0419)			(0.1587)
N	900	900	612	900	900	612

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 opportunities 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 0.198 in *GGO_MA*, is associated with a 28 basis point and 78 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 (see Table IV) 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, with the coefficients always statistically significantly different from zero. Consequently, even though emerging markets may be segmented from global capital markets, local *PE* ratios in emerging markets do a poorer job of predicting future growth opportunities than do global *PE* ratios.

Table V, Panel A provides three additional pieces of information. First, we conduct a robustness analysis investigating the importance of particular industries. Second, we consider the impact of an alternative industry weighting scheme. Third, we consider a third grouping of countries, the European Union.

It is conceivable that our results are driven by a few influential industries. For example, as we mention earlier, oil and gas is one of the most important industries and may be particularly internationally integrated as its performance depends upon global commodity prices. To rule out such a possibility, we repeat our analysis 35 times, each time removing one industry from the weighting scheme. For our largest sample, the brackets in Table V, Panel A report the minimum and maximum coefficients obtained from this exercise. The robustness of our results is evident.[10]

Local market capitalization data may not be fully representative of a country's real activity. For instance, such data may be biased toward industries that are more likely to choose equity financing in bank-oriented economies. Therefore, for manufacturing industries we create industry weights using the value-added information in the UNIDO Industrial Statistics Database. For the developed markets, this strengthens the predictive power of the level measures, but weakens the predictive power of the MA measures. The growth opportunities measures continue to strongly predict future growth. For emerging markets, where perhaps we would have expected the stock market–based weights to be least informative, the value-added measures actually show somewhat less but still overall strong predictive power for future growth. Hereforward, 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.

[10] As an alternative, we also interact the *GGO* measure with the weight of the oil and gas industry in each country; we find insignificant results.

We also investigate a subset of countries from the European Union (plus Norway and Switzerland), which represent a relatively well-integrated set of countries where global growth opportunities should be particularly relevant for future growth. We find that the coefficients for the EU countries are very similar to what we find for developed countries.

In Table V, Panel B, we explore whether predictability depends on three local factors. Note that we only conduct this test for the "All Countries" sample. First, we exclude regulated industries in the construction of *GGO*. Appendix Table AIII lists those industries we view as likely regulated. Regulated industries are presumably less capable of exploiting global growth opportunities. We find that, indeed, predictability is stronger when attention is restricted to unregulated industries, but the change in coefficients is rather minor. Second, we look at a subset of tradable industries. Appendix Table AIII again lists those industries we view as potentially nontradable. We expect tradable sectors to have a stronger link to the global economy and our growth opportunities measures to work better for this set of industries. Panel B reveals that while the predictive power remains very strong, overall it is not stronger than for the full set of industries.

Finally, many countries have privatized many of their state-owned enterprises (SOEs); see Megginson and Netter (2001) for details. Given state-owned companies are typically in industries such as mining that depend on global commodity prices, and further, given they may represent a large part of the real economy, the degree of privatization that has taken place may affect the predictive power of the global growth opportunities measures. Rather than using privatization activity directly, we use the percent of economic activity accounted for by SOEs. Consequently, this variable is negatively correlated with the degree of privatization and is available in a panel of 34 countries. When we interact the growth opportunities measure with this variable, we find highly significant and positive coefficients on the direct effect, and negative interaction coefficients as expected. However, the interaction coefficients are not statistically significantly different from zero. When we use an alternative SOE measure that reflects the proportion of the workforce that is employed by SOEs (not reported), we find significant interaction effects, but this measure is only available for 17 countries.

The last experiment we conduct is to verify that the predictive power of our measure remains significant when we include year dummies or the log of the world market *PE* ratio (*WGO*). We find that both measures (equity market capitalization– and value added–based) are still informative about a country's future growth, discounting the possibility that their predictive power reflects a worldwide wealth effect.

D. 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 that 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. Consequently, we expect growth opportunities to more strongly predict future growth in more financially open markets.

D.1. Capital Account Openness

The first panel in Table VI 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 openness is itself controversial. Rodrik (1998) and Edison et al. (2002) claim that there is no correlation between capital account openness and growth prospects, whereas Edwards (2001), Bekaert et al. (2005), and Quinn and Toyoda (2001) document a positive relation. 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 openness measures.

Our measures of capital account openness are based on the International Monetary Fund's (IMF's) Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The first measure 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 (2001), attempts to determine the degree of capital account openness; the measure is scored from 0 to 4, in half-integer units, with 4 representing a fully open economy. We transform Quinn's measure to 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 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.

D.2. Equity Market Openness

In Table VI, Panel B, we explore the interaction effect between the exogenous growth opportunities measure, *GGO_MA*, and indicators of equity market openness.

Our first measure, the official equity market openness indicator, is based on Bekaert and Harvey's (2005) detailed chronology of important financial, economic, and political events in many developing countries. The variable takes on the value of one when it is possible for foreign portfolio investors to own the equity of a particular country, and zero otherwise. Developed countries, such as the United States, are assumed to be fully liberalized throughout our

Table VI

Exogenous Growth Opportunities and Openness

The sample includes 50 developed and emerging countries between 1980 and 2002. 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, country 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 binary 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) the official equity market openness indicator from Bekaert et al. (2005), (4) the degree of equity market openness (investability), and (5) two indicators of banking sector openness (given data limitations, this regression covers only 41 countries). N denotes the number of country-years. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. * indicates statistical significance at the 5% level. All standard errors in parentheses account for the overlapping nature of the data.

	GDP	Investment
Panel A: Capital Account Openness		
GGO_MA	0.0123*	0.0325*
	(0.0029)	(0.0084)
GGO_MA × Capital Account Openness (IMF)	0.0032	0.0183
	(0.0044)	(0.0137)
	$N = 900$	
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)
	$N = 864$	
Panel B: Equity Market Openness		
GGO_MA	0.0061	0.0143
	(0.0037)	(0.0120)
GGO_MA × Official Equity Market Openness	0.0122*	0.0372*
	(0.0044)	(0.0141)
	$N = 900$	
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)
	$N = 900$	
Panel C: Banking Sector Openness		
GGO_MA	0.0074	0.0171
	(0.0042)	(0.0116)
GGO_MA × Banking Sector Openness	0.0118*	0.0419*
	(0.0048)	(0.0145)
	$N = 738$	
GGO_MA	0.0072	0.0071
	(0.0049)	(0.0130)
GGO_MA × Banking Sector Openness (First-Sign)	0.0107*	0.0475*
	(0.0053)	(0.0147)
	$N = 738$	

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 constituent firms comprising the Standard & Poor's/International Finance Corporation Investable (S&P/IFCI) index to those that comprise the Standard & Poor's/International Finance Corporation Global (S&P/IFCG) index in each country. The global index seeks to represent the local stock market whereas the investable index corrects the market capitalization 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 binary indicator associated with official equity market openness or the continuous measure on the [0,1] interval capturing the degree of equity market openness.

In contrast to the evidence for general capital account openness presented above, the link between growth opportunities and future output and investment growth is much stronger in economies that permit greater access to their equity markets. The interaction coefficient (β) is always statistically significant, both for the official equity market openness indicator and the openness intensity. The coefficient on the direct effect of growth opportunities (α) 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. Because it has been documented that both GDP growth (see Bekaert et al. (2001, 2005)) and investment growth (see Bekaert and Harvey (2000) and Henry (2000)) increase post-liberalization, we also estimate a regression allowing for a direct liberalization effect. These regressions yield similar results to those reported here.

We also use the degree of stock market internationalization variable created by Levine and Schmukler (2003) as an indicator of equity market openness. While the interaction effects are again positive, they are not statistically significant (not reported).[11]

D.3. Banking Sector Openness

Finally, in Table VI, Panel C, we introduce a binary indicator variable that captures the openness of the banking sector to foreign banks. Using a variety of sources, we are 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 openness indicator is equal to zero unless foreign banks have access to the domestic-banking market through the establishment of branches or subsidiaries or through the acquisition of local banks (for details see Table II and Appendix Table AII). While recent studies explore the impact of foreign banks on 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

[11] Note that the sample here starts in 1989.

establishing or expanding their operations in a local market. 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. Appendix Table AII lists the year of the banking liberalization for each of the 41 countries.

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

III. Capital Allocation and Growth Opportunities

Apart from capital controls, many other country characteristics may effectively segment markets or otherwise prevent growth opportunities from aligning with actual growth. In fact, until recently the growth literature seems to have largely ignored the potentially important role of financial openness. However, an extensive literature documents a significant relationship between domestic banking development (e.g., King and Levine (1993)) or stock market development (e.g., Atje and Jovanovic (1993)) and economic growth. As Fisman and Love (2004b) point out, the most obvious channel through which financial development may promote growth is through its role in allocating resources to its most productive uses. In the language of our paper, financial development helps align growth opportunities with growth. In contrast, the influential paper of Rajan and Zingales (1998) stresses the importance of external finance constraints as the mechanism through which financial development promotes growth: Industries that are heavily dependent on external finance grow faster in more financially developed countries. Interestingly, both articles assume a form of market segmentation to allow domestic financial development to play an important role in the intersectoral allocation of resources. As Bekaert et al. (2005) argue, financial openness promotes financial development. Thus, the market segmentation assumption may effectively ignore an important channel for allocative efficiency. In Section III.A, we use our empirical framework to revisit this debate.

La Porta et al. (1997) emphasize the importance of investor protection and, more generally, the quality of institutions and the legal environment as sources for cross-country differences in financial development. In Section III.B, we use our panel setup to directly test the importance of investor protection in helping align growth opportunities with actual growth. We show that investor protection per se is less important than more general measures of political risk, specifically, the components of political risk that may be of particular importance for foreign direct investment.

A. Financial Development, External Finance Dependence, and Growth

Table VII, Panel A considers interaction effects with three important measures of domestic financial development: the ratio of private credit to GDP (banking development), equity market turnover (equity market development),

Table VII

Exogenous Growth Opportunities, Financial Development, and External Finance Dependence

The sample includes 50 developed and emerging countries between 1980 and 2002. 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, country 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; Investment Intensity and External Finance Dependence (Panel B): (1) the ratio of investments to property, plant, and equipment (Investment Intensity), and (2) the amount of investments not financed internally (External Finance Dependence). In Panel C, we interact the growth opportunities measure with four indicators constructed by grouping all country-years into one of four groups. The interaction variables are as follows: an indicator that takes a value of one when the variable (private credit or external finance dependence) is below the median and the equity market is closed or private credit is below the median, and zero otherwise; an indicator that takes the value of one when the variable is below the median and the equity market is open or private credit is above the median, and zero otherwise; an indicator that takes the value of one if the variable is above the median and the equity market is closed or private credit is below the median, and zero otherwise; and finally, and indicator that takes the value of one if the variable is above the median and the equity market is open or private credit is above the median, and zero otherwise. N denotes the number of country-years. We include chi-squared statistics for two sets of Wald tests: (1) the first evaluates whether the first and second and the third and fourth coefficients are equal; (2) the second evaluates whether the first and third and the 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 corrects for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

Panel A: Financial Development ($N = 900$)		
	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: Investment Intensity and External Finance Dependence ($N = 900$)		
	GDP	Investment
GGO_MA	−0.0344	−0.1477
	(0.0272)	(0.0890)
GGO_MA × Investment Intensity	0.1678	0.6507*
	(0.0928)	(0.3075)
GGO_MA	0.0014	−0.0080
	(0.0069)	(0.0233)
GGO_MA × External Finance Dependence	0.0430	0.1580*
	(0.0216)	(0.0758)

Panel C: Openness, Financial Development, and External Finance Dependence ($N = 900$)

	GDP	Investment		GDP	Investment		GDP	Investment
Low Private Credit/	0.0063	0.0074	Low Ext. Fin. Dep./	0.0113*	0.0187	Low Ext. Fin. Dep./	0.0066	0.0138
Closed Equity Market	(0.0041)	(0.0124)	Low Private Credit	(0.0036)	(0.0107)	Closed Equity Market	(0.0041)	(0.0123)
Low Private Credit/	0.0220*	0.0537*	Low Ext. Fin. Dep./	0.0133*	0.0574*	Low Ext. Fin. Dep./	0.0175*	0.0488*
Open Equity Market	(0.0040)	(0.0142)	High Private Credit	(0.0056)	(0.0132)	Open Equity Market	(0.0041)	(0.0117)
High Private Credit/	0.0063	0.0374	High Ext. Fin. Dep./	0.0208*	0.0675*	High Ext. Fin. Dep./	0.0088	0.0285
Closed Equity Market	(0.0066)	(0.0262)	Low Private Credit	(0.0044)	(0.0171)	Closed Equity Market	(0.0081)	(0.0316)
High Private Credit/	0.0152*	0.0489*	High Ext. Fin. Dep./	0.0137*	0.0391*	High Ext. Fin. Dep./	0.0183*	0.0507*
Open Equity Market	(0.0029)	(0.0089)	High Private Credit	(0.0031)	(0.0103)	Open Equity Market	(0.0029)	(0.0098)
Wald Tests:			*Wald Tests:*			*Wald Tests:*		
Closed versus Open	15.17**	10.17**	Low versus High Private Credit	–	–	Closed versus Open	9.59**	8.89*
Low versus High Private Credit	–	–	Low Ext. Fin. Dep. versus High Ext. Fin. Dep.	6.47*	–	Low Ext. Fin. Dep. versus High Ext. Fin. Dep.	0.24	0.48

and the ratio of equity market capitalization to GDP (equity market development). 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, respectively. However, the coefficients on turnover and size are 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, whereas stock market development is not. This stands in contrast to the evidence presented above on stock market *openness*.

Interestingly, these findings are consistent with Fisman and Love (2004b), who posit 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, rather than whether or not these countries simply have well-functioning financial markets. Panel C (left side) in Table VII provides some exploratory analysis of this issue. We split 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 strongly support the idea that it is openness that drives the alignment of growth opportunities with growth, not financial development. Even in markets with poor financial development, the interaction coefficient is highly significant as long as the country has an open equity market. The GDP growth interaction coefficients are at least twice as large for open versus closed equity markets. Not surprisingly, a Wald test strongly rejects the equality of the open versus closed coefficients. The coefficients for low versus high financial development, conditioning on open or closed markets, do not even uniformly suggest a better alignment of growth opportunities with growth for the highly developed markets, making a Wald test meaningless.

The Fisman–Love article casts doubt on the results by Rajan and Zingales (1998), who stress the role of external finance dependence. We obtain the industry-specific time-invariant measures of external finance dependence (the amount of investments not financed internally) and investment intensity (the ratio of investments to property, plant, and equipment) from Rajan and Zingales. These variables are based on U.S. data and are available only for manufacturing industries (see Rajan and Zingales (1998) for details). Using time-varying industry weights measured as an industry's relative value added

in a given country, we construct aggregate measures of external finance dependence and investment intensity.

Table VII, Panel B provides a simple interaction analysis of the growth opportunities measure with the country-specific Rajan–Zingales measures. The interaction is positive and statistically significant at the 5% level for investment and at the 6% level for GDP growth. This interaction effect appears inconsistent with the Rajan–Zingales hypothesis, as it implies that countries with a higher weight in industries that are heavily dependent on external finance manage to better align growth opportunities with growth. However, it is conceivable that industries that require a larger amount of external finance are better represented in countries with well-developed financial markets. This is exactly the claim made by Fisman and Love (2004a).

The middle panel in Table VII, Panel C segregates the sample by level of external finance dependence and financial development. That is, we sort each observation into below- or above-median financial development as well as into below- or above-median external finance dependence. This yields four categories of observations depending on the levels of financial development and external finance dependence. The results are somewhat mixed. In three of four comparisons, we obtain higher interaction coefficients for countries with high external finance dependence than for countries with low external finance dependence, controlling for the degree of financial development. It is not the case that in countries with high external finance dependence, growth opportunities are better aligned with actual growth in countries with better financial development (compare the two last lines). The Wald tests are not reported in three out of four cases because the comparisons do not yield a robust difference in signs across the two realizations of the conditioning variable. For GDP growth rates, countries with relatively low external finance dependence demonstrate a significantly smaller interaction coefficient than countries with high external finance dependence, with the effect mostly driven by the countries with low financial development. All these results are largely inconsistent with the results in Rajan and Zingales (1998). Of course, we have aggregated industries into countries, and this aggregation may exacerbate the problem that external finance dependence should affect the industry mix of a country. Moreover, the division of countries over the four bins shows a distinct positive correlation between financial development and external finance dependence. In fact, the cross-sectional correlation between average external finance dependence and average private credit to GDP is 0.61 for the sample.

It is conceivable that financial openness is again the most important omitted variable. In the right panel of Table VII, Panel C, we explicitly consider this possibility. The results here are very sharp. Conditioning on financial openness, there is no significant difference between the alignment effects of high or low external finance dependent countries. However, there is a strong and statistically significant difference between the alignment effects of open and closed countries, conditional on the degree of external finance dependence.[12] There is

[12] Gupta and Yuan (2004) claim that the growth effects of equity market liberalization primarily take place in the externally dependent industries. Our results may be consistent with what they find, but confirming this would require high-quality panel data on external finance dependence.

a caveat, however, as it is also the case that financial openness and external finance dependence are correlated. In particular, there are very few countries in the high external finance dependence–closed equity markets category.

We conclude that the important debate regarding the role of external finance constraints and financial development in promoting growth thus far ignores an important channel for realizing growth opportunities, namely, the degree of financial openness.

B. Investor Protection, Political Risk, and Growth

We can directly investigate the effect of investor protection on the ability to exploit growth opportunities by interacting our growth opportunities measure with a measure of investor protection. While one of the major advantages of our framework is the panel setup, unfortunately most measures of investor protection or the quality of (legal) institutions have no time dimension. We therefore use two measures obtained from the *International Country Risk Guide*'s (ICRG) political risk ratings, namely, Law and Order and a broader Quality of Institutions measure. This latter measure, which we compile from the ICRG political risk subcomponents, reflects corruption, law and order, and bureaucratic quality (see Table II). We also consider a binary indicator that takes a value one after the first insider trading prosecution in each country (see Bhattacharya and Daouk (2002)). Table VIII, Panel A 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. In Table VIII, Panel B, we repeat the subgroup analysis of Table VII, Panel C for the Law and Order variable. 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; conditional on the level of investor protection, open economies display interaction coefficients about 2.5 to 3 times larger as closed economies. Note that investor protection is likely to be priced and reflected in country-specific *PE* ratios (see La Porta et al. (1997) and Albuquerque and Wang (2007)). However, our analysis in Table VIII uses an *exogenous* growth opportunities measure, so it is not influenced by any country-specific factors.

Finally, we note that the Law and Order and Quality of Institutions 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

Table VIII

Exogenous Growth Opportunities, Investor Protection, and Political Risk

The sample includes 50 developed and emerging countries between 1980 and 2002. 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, country fixed effects. We measure exogenous growth opportunities as *GGO_MA*. We report the coefficient on the growth opportunities measure and interaction terms with investor protection measures (Panel A): (1) the Law and Order index from ICRG, (2) the quality of institutions index, (3) the Insider Trading Prosecution indicator from Bhattacharya and Daouk (2002); Political Risk (Panel C): (1) the political risk index from ICRG, and (2) the investment profile index from ICRG. In Panel B, we interact the growth opportunities measure with four indicators constructed by grouping all country-years into one of four groups. The interaction variables are as follows: an indicator that takes a value of one when the Law and Order index from ICRG is below the median and the equity market is closed, and zero otherwise; an indicator that takes the value of one when the Law and Order index from ICRG is below the median and the equity market is open, and zero otherwise; an indicator that takes the value of one if the Law and Order index from ICRG is above the median and the equity market is closed, and zero otherwise; and finally, and indicator that takes the value of one if the Law and Order index from ICRG is above the median and the equity market is open, and zero otherwise. N denotes the number of country-years. We include chi-squared statistics for two sets of Wald tests: (1) the first evaluates whether the first and second and the third and fourth coefficients are equal; (2) the second evaluates whether the first and third and the second and fourth coefficients are equal. * indicates significance at the 5% level. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. All standard errors in parentheses account for the overlapping nature of the data.

	GDP	Investment
Panel A: Investor Protection ($N = 900$)		
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 B: Openness and Law and Order ($N = 900$)		
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

(*continued*)

Table VIII—*Continued*

	GDP	Investment
Panel C: Political Risk ($N = 900$)		
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)

investors have guidelines that prohibit them from investing in the equity markets of certain risky countries. For example, CalPERS, the largest U.S. pension fund, has a Permissable Country Program that 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 Table VIII, Panel C, we consider the overall ICRG political risk rating, which is a composite of 12 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 significantly 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 A), but rather to those aspects of the legal and regulatory environment that directly relate to the stability and security of inward investment. Our analysis indirectly reveals the importance of international capital flows in aligning growth opportunities with growth.

IV. Growth Opportunities and Market Integration

A. Econometric Framework

In Table V, we present evidence that exogenous growth opportunities predict future output and investment growth. Table VI 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 excess growth. In integrated markets,

countries that contain high (low) *PE* ratio industries should grow at a faster (slower) rate than the rest of the world. In other words, we test the null of market segmentation.

Concretely, the regressions we consider are

$$y_{i,t+k,k} - y_{w,t+k,k} = \alpha_{i,0} + \alpha_{i,1,t} LEGO\_MA_{i,t} + \eta_{i,t+k,k} \tag{13}$$

$$y_{i,t+k,k} - y_{w,t+k,k} = \alpha_{i,0} + \alpha_{i,1,t} GEGO\_MA_{i,t} + \eta_{i,t+k,k}, \tag{14}$$

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. The variable $LEGO\_MA_{i,t} (= LGO\_MA_{i,t} - GGO\_MA_{i,t})$ 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. We focus on our largest sample of 50 countries to maximize both the cross-sectional and time-series information in our sample. Moreover, we use the interaction effects between excess exogenous growth opportunities and our openness measures to formulate our tests for either fully integrated or fully segmented countries, as in equation (12). Again, $Open_{i,t}$ indicates capital account, equity market, or banking sector openness. This is likely to lead to more powerful tests than dividing countries into developed and emerging markets because that division mixes financially open and closed countries in both subsamples. For example, according to the IMF capital control measure, Denmark had a closed capital account before 1988, whereas Malaysia had generally open capital markets throughout the sample until the late 1990s. By making our tests depend on the de jure degree of financial openness, we essentially verify whether de jure and de facto openness, that is, integration, coincide. It is well known that for many reasons they may not (see, e.g., the discussion in Bekaert and Harvey (1995)).

B. The Null of Market Integration

The three panels in Table IX correspond to the different measures of openness in Table VI. With the *LEGO_MA* measure, we expect the interaction effect (β) to be negative: *LEGO_MA* 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. The null of market integration is formally rejected for closed countries at the 5% level in three of the four cases for investment growth (in Panels A and C). Overall, and for investment growth in particular, the constant term (α) and the interaction term (β) in $\alpha_{i,1,t}$ are of about the same magnitude and the constant term is significantly positive in three out of the four investment growth cases. For the GDP growth regressions, it is positive but not significantly different from

Table IX
Null of Market Integration

This sample includes 50 developed and emerging countries between 1980 and 2002. 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, country fixed effects. We measure excess local growth opportunities as *LEGO_MA*, the difference between local and exogenous growth opportunities (*LGO_MA-GGO_MA*). We report the coefficient on the growth opportunities measure and interaction terms with (1) a binary 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 openness from Bekaert et al. (2005), (4) the degree of equity market openness (investability), and (5) two indicators of banking sector openness (only 41 countries are available). We also report Wald tests on the null hypotheses of market integration: $\alpha = 0$ for closed countries or $\alpha + \beta = 0$ for open countries. N denotes the number of country-years. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. * denotes statistical significance at the 5% level. All standard errors in parentheses account for the overlapping nature of the data.

		GDP	Investment			GDP	Investment
Panel A: Capital Account Openness							
LEGO_MA	(α)	0.0019	0.0160*	*LEGO_MA*	(α)	0.0056	0.0502*
		(0.0013)	(0.0033)			(0.0034)	(0.0146)
LEGO_MA × Capital Account	(β)	−0.0019	−0.0189*	*LEGO_MA* × Capital Account	(β)	−0.0051	−0.0530*
Openness (IMF)		(0.0016)	(0.0056)	Degree of Openness (Quinn)		(0.0039)	(0.0174)
		$N = 415$				$N = 408$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		2.01	23.51*	Closed Countries ($\alpha = 0$)		2.63	11.82*
Open Countries ($\alpha + \beta = 0$)		0.00	0.41	Open Countries ($\alpha + \beta = 0$)		0.05	0.09

Panel B: Equity Market Openness							
LEGO_MA	(α)	−0.0029	−0.0165	*LEGO_MA*	(α)	−0.0003	0.0194
		(0.0081)	(0.0248)			(0.0033)	(0.0147)
LEGO_MA × Official Equity Market Openness	(β)	0.0040	0.0227	*LEGO_MA* × Equity Market Degree of Openness	(β)	0.0015	−0.0158
		(0.0082)	(0.0250)			(0.0036)	(0.0156)
		$N = 415$				$N = 415$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		0.13	0.44	Closed Countries ($\alpha = 0$)		0.01	1.75
Open Countries ($\alpha + \beta = 0$)		1.24	2.73	Open Countries ($\alpha + \beta = 0$)		0.70	0.44
Panel C: Banking Sector Openness							
LEGO_MA	(α)	0.0023	0.0172	*LEGO_MA*	(α)	0.0028	0.0342*
		(0.0020)	(0.0107)			(0.0038)	(0.0121)
LEGO_MA × Banking Sector Openness	(β)	−0.0009	−0.0182*	*LEGO_MA* × Banking Sector Openness (First-Sign)	(β)	−0.0007	−0.0294*
		(0.0023)	(0.0040)			(0.0040)	(0.0127)
		$N = 394$				$N = 394$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		1.34	2.60	Closed Countries ($\alpha = 0$)		0.54	8.00*
Open Countries ($\alpha + \beta = 0$)		0.40	0.01	Open Countries ($\alpha + \beta = 0$)		0.27	1.63

Table X

Null of Market Segmentation

This sample includes 50 developed and emerging countries between 1980 and 2002. 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, country 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 binary 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 openness from Bekaert et al. (2005), (4) the degree of equity market openness (investability), and (5) two indicators of banking sector openness (only 41 countries are available). We also report Wald tests on the null hypotheses of market segmentation: $\alpha = 0$ for closed countries or $\alpha + \beta = 0$ for open countries. N denotes the number of country-years. The weighting matrix we employ in our GMM estimation corrects for cross-sectional heteroskedasticity. * indicates statistical significance at the 5% level. All standard errors in parentheses account for the overlapping nature of the data.

		GDP	Investment			GDP	Investment
Panel A: Capital Account Openness							
GEGO_MA	(α)	0.0099*	0.0267*	*GEGO_MA*	(α)	0.0081	0.0420
		(0.0041)	(0.0134)			(0.0090)	(0.0308)
GEGO_MA × Capital Account Openness (IMF)	(β)	0.0012	0.0026	*GEGO_MA* × Capital Account Degree of Openness (Quinn)	(β)	0.0026	−0.0238
		(0.0067)	(0.0197)			(0.0127)	(0.0407)
		$N = 900$				$N = 864$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		5.64*	3.95*	Closed Countries ($\alpha = 0$)		0.82	1.86
Open Countries ($\alpha + \beta = 0$)		4.37*	4.14*	Open Countries ($\alpha + \beta = 0$)		3.92*	1.39

Panel B: Equity Market Openness							
GEGO_MA	(α)	0.0022	0.0360	*GEGO_MA*	(α)	0.0058	0.0333
		(0.0059)	(0.0193)			(0.0061)	(0.0191)
GEGO_MA × Official Equity Market Openness	(β)	0.0124	−0.0133	*GEGO_MA* × Equity Market Degree of Openness	(β)	0.0075	−0.0090
		(0.0071)	(0.0223)			(0.0075)	(0.0227)
		$N = 900$				$N = 900$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		0.15	3.50	Closed Countries ($\alpha = 0$)		0.93	3.05
Open Countries ($\alpha + \beta = 0$)		13.65*	4.08*	Open Countries ($\alpha + \beta = 0$)		10.79*	4.35*
Panel C: Banking Sector Openness							
GEGO_MA	(α)	0.0060	0.0190	*GEGO_MA*	(α)	−0.0006	−0.0050
		(0.0071)	(0.0190)			(0.0086)	(0.0241)
GEGO_MA × Banking Sector Openness	(β)	0.0074	0.0050	*GEGO_MA* × Banking Sector Openness (First-Sign)	(β)	0.0145	0.0332
		(0.0081)	(0.0226)			(0.0093)	(0.0266)
		$N = 738$				$N = 738$	
Wald Tests				*Wald Tests*			
Closed Countries ($\alpha = 0$)		0.72	1.00	Closed Countries ($\alpha = 0$)		0.00	0.04
Open Countries ($\alpha + \beta = 0$)		12.05*	3.90*	Open Countries ($\alpha + \beta = 0$)		14.13*	6.31*

zero. As a result, we fail to reject market integration for open countries (null hypothesis: $\alpha + \beta = 0$) in each case. Hence, for open countries *LEGO_MA* does not predict relative growth, but for closed countries it does. For the binary equity market openness measure, there are no significant coefficients and some coefficients have the wrong sign.

C. The Null of Market Segmentation

In Table X, we present evidence for the alternative regression (14) 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 toward 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 toward high growth opportunities. In a regression over all countries (not reported), *GEGO_MA* comes in highly significantly for both GDP and investment growth.

If de jure and de facto integration coincide, *GEGO_MA* should predict relative growth for relatively open countries, but not necessarily for closed countries. The results in Table X are qualitatively consistent with this hypothesis. With the exception of the capital account openness measure (IMF), the constant terms (α) are not statistically different from zero. Consequently, we reject the null of market segmentation for closed countries in only 2 out of the 12 cases. While the interaction effects (β) themselves fail to be statistically significant, the combined effect for integrated countries ($\alpha + \beta$) is almost always statistically significant. We reject the null of segmentation for open countries in 11 out of the 12 cases. This happens even though the interaction effect is negative in 3 cases. Clearly, while there is a relation between our broad concept of integration and de jure financial openness, it is not perfect.

V. Conclusions

Our research proposes a simple measure of country-specific growth opportunities based on price to earnings (*PE*) ratios determined in global stock markets. We combine information about a country's industrial composition and the growth opportunities contained in global *PE* ratios that each of these industries face. Importantly, we find that this measure of *exogenous* growth opportunities predicts future output and investment growth.

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

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

Finally, we consider tests of market integration and segmentation. First, if growth opportunities are indeed globally priced and exploited, the difference between local and global price to earnings ratios should not predict the relative growth performance of a country. The null of market integration is only rejected for segmented countries using the investment growth regressions. Second, in integrated markets, the difference in industrial composition relative to the world multiplied with world price to earnings ratios should be a main driver of relative growth, as the countries with the high *PE* ratio industries should be the ones that capture the highest growth rates. We mostly reject the null of market segmentation for integrated countries, but the results also reveal that de jure and de facto openness are not always synonymous. In future work, we will attempt to measure the effective degree of integration and its determinants.

Appendix A: Price-to-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, $\Delta \ln(Earn_{i,j,t})$ in country i industry j as

$$\Delta \ln(Earn_{i,j,t}) = \gamma_{i,j} GO_{w,j,t-1} + \epsilon_{i,j,t}. \tag{A1}$$

Earnings growth is affected by worldwide growth opportunities in industry j, defined as $GO_{w,j,t}$, and an idiosyncratic noise term that 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:

$$GO_{w,j,t} = \mu_j + \varphi_j GO_{w,j,t-1} + \epsilon_{w,j,t}. \tag{A2}$$

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:

$$\delta_{i,j,t} = r_f(1 - \beta_{i,j}) + \beta_{i,j}\delta_{w,t}. \tag{A3}$$

With r_f equal to the constant risk-free rate, the constant term arises because the discount rates are *total*, not *excess*, discount rates. An equation like (A3) would follow from a logarithmic version of the standard world CAPM. The world discount rate process follows:

$$\delta_{w,t} = d_w + \phi_w \delta_{w,t-1} + \eta_{w,t}, \tag{A4}$$

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

$$\beta_{i,j} = \beta_j. \tag{A5}$$

Suppose that each industry pays out all earnings, $Earn_{i,j,t}$, each period. Then the valuation of the industry under (A1)–(A4) is

$$V_{i,j,t} = E_t \left[\sum_{k=1}^{\infty} \exp\left(-\sum_{\ell=0}^{k-1} \delta_{i,j,t+\ell} \right) Earn_{i,j,t+k} \right]. \tag{A6}$$

Given that we model earnings growth as in equation (A1), the earnings process is nonstationary. We must therefore scale the current valuation by earnings and impose a transversality condition to obtain a solution:

$$\begin{aligned} PE_{i,j,t} = \frac{V_{i,j,t}}{Earn_{i,j,t}} &= E_t \left[\sum_{k=1}^{\infty} \exp\left(\sum_{\ell=0}^{k-1} -\delta_{i,j,t+\ell} + \Delta \ln(Earn_{i,j,t+1+\ell}) \right) \right] \\ &= \sum_{k=1}^{\infty} Q_{i,j,k,t}. \end{aligned} \tag{A7}$$

Note that for $k = 1$,

$$\begin{aligned} Q_{i,j,1,t} &= E_t[\exp(-\delta_{i,j,t} + \Delta \ln(Earn_{i,j,t+1}))] \\ &= \exp\left(-r_f(1 - \beta_{i,j}) - \beta_{i,j}\delta_{w,t} + \gamma_{i,j} GO_{w,j,t} - \frac{1}{2}\sigma_{i,j}^2 \right). \end{aligned} \tag{A8}$$

We conjecture

$$Q_{i,j,k,t} = \exp(a_{i,j,k} + b_{i,j,k}\delta_{w,t} + c_{i,j,k} GO_{w,j,t}). \tag{A9}$$

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.

$$
\begin{aligned}
Q_{i,j,k+1,t} &= E_t\left[\exp\left(\sum_{\ell=0}^{k} -\delta_{i,j,t+\ell} + \Delta\ln(Earn_{i,j,t+1+\ell})\right)\right] \\
&= E_t\Bigg[\exp(-\delta_{i,j,t} + \Delta\ln(Earn_{i,j,t+1})) \\
&\quad \cdot \exp\left(\sum_{\ell=0}^{k-1} -\delta_{i,j,t+1+\ell} + \Delta\ln(Earn_{i,j,t+2+\ell})\right)\Bigg] \\
&= E_t[\exp(-\delta_{i,j,t} + \Delta\ln(Earn_{i,j,t+1}) + a_{i,j,k} \\
&\quad + b_{i,j,k}\delta_{w,t+1} + c_{i,j,k}GO_{w,j,t+1})]. \qquad \text{(A10)}
\end{aligned}
$$

Consequently,

$$
\begin{aligned}
&\exp(a_{i,j,k+1} + b_{i,j,k+1}\delta_{w,t} + c_{i,j,k+1}GO_{w,j,t}) \\
&= \exp\Bigg\{a_{i,j,k} + b_{i,j,k}d_w + c_{i,j,k}\mu_j - r_f(1-\beta_{i,j}) - \frac{1}{2}\left(\sigma_{i,j}^2 + b_{i,j,k}^2 s_w^2 + c_{i,j,k}^2\sigma_{w,j}^2\right) \\
&\quad + (\gamma_{i,j} + c_{i,j,k}\varphi_j)GO_{w,j,t} + (-\beta_{i,j} + b_{i,j,k}\phi_w)\delta_{w,t}\Bigg\}. \qquad \text{(A11)}
\end{aligned}
$$

Hence, matching coefficients, we find

$$
\begin{aligned}
a_{i,j,k+1} &= a_{i,j,k} - r_f(1-\beta_{i,j}) + b_{i,j,k}d_w + c_{i,j,k}\mu_j \\
&\quad - \frac{1}{2}\left(\sigma_{i,j}^2 + b_{i,j,k}^2 s_w^2 + c_{i,j,k}^2\sigma_{w,j}^2\right) \qquad \text{(A12)}
\end{aligned}
$$

$$
b_{i,j,k+1} = -\beta_{i,j} + b_{i,j,k}\phi_w \qquad \text{(A13)}
$$

$$
c_{i,j,k+1} = \gamma_{i,j} + c_{i,j,k}\varphi_j. \qquad \text{(A14)}
$$

In Equation (A5) we assume under the hypothesis of market integration that industries in different countries face the same discount rate. Hence, 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

$$
\gamma_{i,j} = \gamma_j = 1. \qquad \text{(A15)}
$$

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 $\gamma_j = 1$ because growth opportunities are industry specific. Bringing everything together, we find that the price-to-earnings ratio for a particular industry in a particular country can be written as

$$
PE_{i,j,t} = \sum_{k=1}^{\infty} \exp(a_{i,j,k} + b_{j,k}\delta_{w,t} + c_{j,k}GO_{w,j,t}). \qquad \text{(A16)}
$$

An improvement in growth opportunities revises price-to-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 (A16) can be linearized around the mean values for $\delta_{w,t}$ and $GO_{w,j,t}$, leading to the expression in the text (4).

Appendix B: Constructing Measures of Growth Opportunities

Data availability provided, we construct measures of growth opportunities at a monthly frequency from January 1973 to December 2002. However, for the main results in Sections II through IV of this paper, we focus on the December values of our measures of growth opportunities between 1980 and 1997.

Local Growth Opportunities

We approximate *LGO* with the log of the market *PE* ratio of a given country. We collect market *PE* ratios from Datastream for the last day of each month. Thirteen of our 50 countries are not covered by Datastream; for these countries we use *PE* ratios from Standard & Poor's Emerging Markets Data Base (EMDB) 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 market *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 AI reports for each country which data are used to construct *LGO* and in which month the coverage begins.

Exogenous Global Growth Opportunities

The variable *GGO* as defined in (6) is the log of the inner product of the vector of global industry *PE* ratios and the vector of country-specific industry weights. While Datastream is the only source for the global industry *PE* ratios (monthly frequency), we use different sources to derive country-specific industry weights (annual frequency). In particular, we use Datastream as well as EMDB 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 lagged market values for 35 industrial sectors covered by Datastream with the corresponding global *PE* ratios for the same 35 industries,[13] that is, the market capitalizations

[13] Datastream uses the FTSE industry classification with 35 industrial sectors (level 4 in Datastream) and 101 subsectors (level 5 in Datastream). For a detailed description see "FTSE Global Classification System," available at http://www.ftse.com.

reflect information as of December 31 of the previous year with respect to the information contained in the *PE* ratios.[14]

For the remaining 29 countries, we derive industry weights from lagged market capitalization data reported by EMDB. EMDB employs the two-digit SIC classification. To combine these industry weights with the global industry *PE* ratios from Datastream, we link the 101 industrial subsectors from Datastream to 82 SIC groups, obtaining global *PE* ratios for each SIC group.[15] Whenever more than one Datastream subsector is included in an SIC group, we calculate the weighted average of the *PE* ratios of the entering subsectors using the subsectors' 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.[16]

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 three-digit ISIC (rev. 2) system, 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 39 (manufacturing) of the 101 industrial subsectors from Datastream to the 28 ISIC manufacturing industries, obtaining global *PE* ratios for each ISIC group. Whenever more than one Datastream subsector is included in an ISIC group, we calculate the weighted average of the *PE* ratios of the entering subsectors using the subsectors' market values as of December 31 of the same year. Value added–based industry weights reflect information as of the same year with respect to the information contained in the *PE* ratios.[17]

[14] If t = May 1985 and $GGO_{i,t} = \ln[IW'_{i,t}PE_{w,t}]$, the industry weights, $IW_{i,t}$, 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 in which 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 Appendix Table AI for details.

[15] For the Datastream subsector "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.

[16] The only exceptions to this rule are the years 1973–1975, where the industry weights are as of December 31, 1975, cases in which EMDB country coverage starts after 1975, and values for 2002, where the industry weights are as of December 31, 2000. If EMDB coverage for a specific country starts after 1975, we use the earliest available observation for the previous years without observations. Since EMDB coverage of Portugal ends in 1998, we use the 1998 industry structure from 1999 to 2002. See Appendix Table AI for details.

[17] The only exceptions to this rule are cases in which UNIDO country coverage is missing. If UNIDO coverage for a specific country starts after 1973, we again use the earliest available observation for the previous years without observations. If UNIDO coverage for a specific country is interrupted, we use the last available observations. Since UNIDO coverage ends in 1998, we use the 1998 industry structure from 1998 to 2002. See Appendix Table AI for details.

World Growth Opportunities

The variable *WGO* as defined in (8) is the log of the inner product of the vector of global industry *PE* ratios and the vector of global industry weights. We use the same vector of global *PE* ratios from Datastream as in the construction of *GGO*. Global industry weights are based on relative world market capitalization. As with the market capitalization–based measure of global growth opportunities, we again use lagged industry weights.

Measures of Excess Growth Opportunities

For the construction of *LEGO* and *GEGO* we use the market capitalization–based measure of global growth opportunities, *GGO*. We construct *LEGO* by subtracting *GGO* from *LGO*, and *GEGO* by subtracting *WGO* from *GGO*.

Table AI
Sample Composition and Data Sources

For the construction of *LGO*, market *PE* ratios from Datastream (preferred source), S&P's Emerging Markets Data Base (EMDB), 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 EMDB (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*), value added-based industry weights (IW) are obtained from the UNIDO Industrial Statistics Database. The table reports since which year value added data are available.

Sample Composition		*LGO*: Sources and Availability of *PE*			*GGO*: Sources and Availability of Industry Weights (IW)		
Sample	Country	Datastream Available Since	EMDB Available Since	MSCI Available Since	Datastream Annual IW Start in	EMDB Annual IW Start in	UNIDO Annual IW Start in
	World	Jan-73			–	–	–
I, III	Argentina	Jul-91				1983	1983
I, II	Australia	Jan-73			1973		1973
I, II	Austria	Jan-73			1973		1973
I, III	Bangladesh		Jan-96			1996	1973
I, II	Belgium	Jan-73			1973		1973
I, III	Brazil	May-99				1981	1990
I, II	Canada	Jan-73			1973		1973
I, III	Chile	Jul-89				1975	1973
I, III	Colombia	Feb-93				1984	1973
I, III	Cote d'Ivoire		Jan-96			1996	1973
I, II	Denmark	Jan-73			1973		1973
I, III	Egypt		Jan-96			1996	1973
I	Finland	Mar-88			1987		1973
I, II	France	Jan-73			1973		1973
I, II	Germany	Jan-73			1973		1973
I, III	Greece	Jan-90				1975	1973
I, III	India	Jan-90				1975	1973
I, III	Indonesia	Jan-91				1989	1973
I, II	Ireland	Jan-73			1973		1973
I, III	Israel	Jan-93				1997	1973

(continued)

Table AI—*Continued*

Sample Composition		*LGO*: Sources and Availability of *PE*			*GGO*: Sources and Availability of Industry Weights (IW)		
Sample	Country	Datastream Available Since	EMDB Available Since	MSCI Available Since	Datastream Annual IW Start in	EMDB Annual IW Start in	UNIDO Annual IW Start in
I	Italy			Apr-84	1973		1973
I, III	Jamaica		Jan-96			1996	1973
I, II	Japan	Jan-73			1973		1973
I, III	Jordan		Jul-86			1978	1973
I, III	Kenya		Jan-96			1996	1973
I, III	Korea, South	Jan-88				1975	1973
I, III	Malaysia	Jan-86				1984	1973
I, III	Mexico	Jul-90				1975	1973
I, III	Morocco		Jan-96			1996	1973
I, II	Netherlands	Jan-73			1973		1973
I	New Zealand	Jan-88			1988		1973
I, III	Nigeria		Sep-86			1984	1973
I, II	Norway			Jan-73	1980		1973
I, III	Pakistan		Apr-86			1984	1973
I, III	Philippines	Sep-87				1984	1973
I, III	Portugal	Jan-90				1986	1973
I, II	Singapore	Jan-73			1973		1973
I, II, III	South Africa	Jan-73			1973		1973
I	Spain			Jan-80	1987		1973
I, III	Sri Lanka		Jan-93			1992	1973
I, II	Sweden			Jan-73	1982		1973
I, II	Switzerland	Jan-73			1973		1986
I, III	Thailand	Jan-87				1975	1973
I, III	Trinidad and Tobago		Jan-96			1996	1973
I, III	Tunisia		Jan-96			1996	1973
I, III	Turkey	Apr-90				1986	1973
I, II	United Kingdom	Jan-73			1973		1973
I, II	United States	Jan-73			1973		1973
I, III	Venezuela	Mar-92				1984	1973
I, III	Zimbabwe		Jan-86			1975	1973

Table AII

Dating Openness

The official equity market openness dates are based on Bekaert and Harvey (2005). Banking openness dates and first-sign dates are defined in Table II. 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 open from 1980 to 2002.

Country	Official Equity Market Openness Year	Banking Openness Year	Banking Openness First-Sign Year
Argentina	1989	1980–1983, 1994	1980–1983, 1994
Australia	open	1992	1985
Bangladesh	1991	n/a	n/a
Brazil	1991	1995	1995

(continued)

Table AII—*Continued*

Country	Official Equity Market Openness Year	Banking Openness Year	Banking Openness First-Sign Year
Canada	open	1994	open
Chile	1992	1998	1998
Colombia	1991	1990	1990
Côte d'Ivoire	1995	n/a	n/a
Egypt	1992	1993	1993
Greece	1987	1992	1987
India	1992	closed	1992
Indonesia	1989	1999	1988
Israel	1993	open	open
Jamaica	1991	n/a	n/a
Japan	1983	1985	1985
Jordan	1995	n/a	n/a
Kenya	1995	open	open
South Korea	1992	1998	1982
Malaysia	1988	closed	closed
Mexico	1989	1994	1991
Morocco	1988	n/a	n/a
New Zealand	1987	1987	1987
Nigeria	1995	n/a	n/a
Norway	open	1985	1985
Pakistan	1991	closed	1994
Philippines	1991	2000	1994
Portugal	1986	1984	1984
South Africa	1996	open	open
Spain	1985	open	open
Sri Lanka	1991	1998	1988
Sweden	open	1985	1985
Thailand	1987	closed	1997
Trinidad & Tobago	1997	n/a	n/a
Tunisia	1995	n/a	n/a
Turkey	1989	open	open
Venezuela	1990	1994	1994
Zimbabwe	1993	n/a	n/a

Table AIII

Regulated and Nontradable Industries

Among the 35 industrial sectors used by Datastream, we identify those that are likely regulated or nontradable. We consider the remaining industries unregulated or tradable.

Industry	Regulated	Nontradable
Mining	–	–
Oil and Gas	–	–
Chemicals	–	–
Construction and Building Materials	–	Nontradable
Forestry and Paper	–	–
Steel and Other Metals	Regulated	–
Aerospace and Defense	Regulated	–
Diversified Industrials	–	–
Electronic and Electrical Equipment	–	–
Engineering and Machinery	–	–
Automobiles and Parts	–	–

(continued)

Table AIII—*Continued*

Industry	Regulated	Nontradable
Household Goods and Textiles	–	–
Beverages	–	–
Food Producers and Processors	Regulated	–
Health	Regulated	Nontradable
Personal Care and Household Products	–	–
Pharmaceuticals and Biotechnology	Regulated	–
Tobacco	Regulated	–
General Retailers	–	Nontradable
Leisure and Hotels	–	Nontradable
Media and Entertainment	–	Nontradable
Support Services	–	Nontradable
Transport	Regulated	–
Food and Drug Retailers	–	Nontradable
Telecommunication Services	Regulated	Nontradable
Electricity	Regulated	Nontradable
Utilities - Other	Regulated	Nontradable
Banks	Regulated	Nontradable
Insurance	Regulated	Nontradable
Life Assurance	Regulated	Nontradable
Investment Companies	–	–
Real Estate	–	Nontradable
Speciality and Other Finance	Regulated	Nontradable
Information Technology Hardware	–	–
Software and Computer Services	–	–

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