The Asset Growth Effect: Insights from International Equity Markets *

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Abstract

Stocks with higher past asset growth rates experience lower future returns in 40 international equity markets, consistent with the U.S. evidence documented by Cooper et al. (2008). This negative effect of asset growth on stock return is stronger in developed capital markets with relatively efficient stock prices and weaker in emerging markets and bank-dominated financial systems where stocks are less informatively priced. Further, the cross-country difference is positively related to a measure capturing the discount-rate effect on the investment-return relation. On the other hand, country characteristics related to corporate governance and investor protection, and measures of limits to arbitrage such as idiosyncratic volatility and liquidity, do not have explanatory power. The evidence suggests that low stock returns to high asset growth firms are likely due to a rational investment effect, rather than due to over-investment, market timing, or other forms of mispricing.

I. Introduction

It has been documented that firms experiencing rapid growth by raising external financing and making investments subsequently have low stock returns, whereas firms experiencing contraction via divesture, share repurchase, and debt retirement subsequently enjoy high stock returns.[1] Recently, Cooper, Gulen, and Schill (2008) summarize the synergistic effect of firms' investment and financing activities by a simple measure of total asset growth. They show that in the U.S. market during the period from 1968 to 2003, a value-weighted portfolio of stocks in the top asset-growth decile underperform the portfolio of stocks in the bottom decile by 13% per year, and such cross-sectional return difference cannot be explained by standard asset pricing models.

One of the most actively debated issues in the current finance literature is whether the negative effect of investment and financing on stock returns – incorporated in the asset growth effect – is evidence of market inefficiency or can be viewed as a rational asset pricing result. From the behavioral camp, several mispricing-based explanations have been proposed. They include 1) over-investment and empire-building tendency of corporate managers (e.g., Titman, Wei, and Xie, 2004), 2) capital structure market timing when raising and retiring external financing (e.g., Baker and Wurgler, 2002), 3) earnings management prior to financing activities or acquisitions (e.g., Teoh, Welch, Wong, 1998a; 1998b), and 4) excessive extrapolation on past growth by investors when they value firms (e.g., Lakonishok, Shleifer, and Vishny, 1994).[2] From the rational asset pricing camp, the explanations center around the association between investment and expected return, albeit with some variations. For example, in Cochrane (1991, 1996) and Liu, Whited, and Zhang (2009), firms making large investments are likely to be those with low discount rates. In Lyandres, Sun, and Zhang (2008), and Li, Livdan, and Zhang (2009), higher investments are associated with lower expected returns via both decreasing return to scale and the discount rate effect (that lower discount-rate firms make larger investments).

[1] See Cooper, Gulen, and Schill (2008) for a survey of the large body of empirical literature regarding the effects of firms' financing and investment activities on operating performance and stock returns.

[2] In addition, a number of empirical papers, such as Agrawal, Jaffee, and Mandelker (1992), Ikenberry, Lakonishok, and Vermaelen (1995), Loughran and Ritter (1995), Rau and Vermaelen (1998), and Richardson and Sloan (2003), have subscribed to one or multiple mispricing-based explanations.

Additionally, in Berk, Green and Naik (1999) and Carlson, Fisher, and Giammarino (2004), firms have reduced risk and expected return after growth options or real options are exercised.[3]

It is difficult to empirically distinguish the mispricing hypotheses from the rational investment-based hypotheses, because they offer very similar predictions on the relation of corporate investments with both future stock returns and firms' future operating performance. Recent studies have instead focused on *conditional* evidence, by examining the effect of investment or financing on stock returns during subperiods or in subsamples of stocks. For example, Wei, Xie, and Titman (2004) find that the negative investment-return relation is stronger among firms with greater managerial investment discretion (e.g., higher cash flows and lower debt ratios), and is only significant during time periods when external corporate governance is weak (e.g., when hostile takeovers are not prevalent). Relatedly, Cooper, Gulen, and Schill (2008) show that the asset growth effect on stock return is weaker during sample periods when external corporate oversight becomes stronger, and is stronger when investor sentiment (measured by past market return) is stronger. Further, both Lipson, Mortal, and Schill (2009) and Lam and Wei (2009) report a stronger asset growth anomaly among stocks facing more severe limits to arbitrage as measured by arbitrage risk, information cost, and liquidity. While these studies favor mispricing-based interpretations, Li and Zhang (2009) argue that in a rational investment model, the investment-return relation should also be stronger among firms facing higher investment and financing frictions. Therefore, a stronger asset growth effect when limits to arbitrage are more severe cannot be automatically viewed as evidence of mispricing, because proxies for limits to arbitrage may also be proxies for frictions to investments and financing.

In this study, we take the battleground to the international arena and examine the asset growth effect in 40 equity markets.[4] We have two goals. The first is to show that the negative relation between asset growth and future stock returns exists in financial markets outside the US. This could alleviate the concern that the empirical pattern documented in the U.S. is due to chance or data-snooping.

[3]A few other studies have provided empirical evidence consistent with the above-mentioned rational investment effect; see, for example, Anderson and Garcia-Feijoo (2006), Fama and French (2006), and Xing (2008).

[4]Throughout the paper we use the term "country" and "market" interchangeably, with the understanding that some markets, such as Hong Kong, are not sovereign countries.

Our second, perhaps even more interesting, objective is to shed new light on the plausible economic cause of the asset growth effect, by investigating how the cross-country differences in the asset growth-return relation are affected by various country characteristic measures, such as stock market efficiency, corporate governance, investor protection, and severity of limits to arbitrage. Depending on the hypotheses examined, these country characteristics are related to the magnitude of asset growth effect in quite different ways. For example, if the asset growth effect is due to mispricing, one would expect it to be stronger in countries where stocks are less efficiently priced, and in countries where arbitrage is difficult to carry out. Further, if managerial "empire-building" or capital structure market timing is behind the asset growth effect, one would expect this effect to be weaker in countries with stronger governance and investor protection characteristics. On the other hand, if a rational investment effect drives the asset growth-return relation, the magnitude of this relation should be positively correlated with the efficiency of stock market, and at least some of the rational investment-return channels – such as the discount rate effect of Cochrane (1996) and the decreasing return to scale effect proposed by Li, Livdan, and Zhang (2009) – would become visible. Therefore, the large heterogeneity in country characteristics can potentially provide useful information to evaluate competing hypotheses on the asset growth effect.

Using the Datastream-WorldScope data for the period from 1982 to 2006, we find that, on aggregate, the asset growth effect exists in the international equity markets. When stocks are pooled together across all countries outside US and then sorted on asset growth into equal-weighted decile portfolios, the return spread between the top and bottom decile portfolios is significantly negative, at -5.40% per year. When we form asset growth decile portfolios within each country, the return spread between the top and bottom decile, averaged across countries, is -4.76% per year. Results based on Fama-MacBeth regressions further show that the asset growth effect is not explained away by other return-predictive stock characteristics such as size, book-to-market, momentum. After decomposing asset growth into growth of various assets and financing components following Cooper et al. (2008), we further find patterns that are quite similar to those obtained for the U.S. market – on the assets side, the return predictive power comes from growth of both current assets and fixed assets; on the financing side, the return predictive power comes from growth of both equity and debt.

Across countries, however, the magnitude of the asset growth effect varies largely. For example, the return spread between the top and bottom asset growth decile portfolios is negative in 27 countries, but positive in the remaining 13 countries.

When analyzing what country characteristics may affect the magnitude of the asset growth effect, we focus on four groups of variables that potentially offer telling results to distinguish rational vs. mispricing hypotheses. The first group includes variables indicative of stock price efficiency in a financial market – capital market to GDP ratio, bank loan to GDP ratio (as well as the capital market to bank loan ratio), and the R-square measure of Morck, Yeung, and Yu (2000).[5] The second group includes two measures capturing the "cash-flow channel" effect and the "discount rate channel" effect from rational investment models; they are estimated via a vector autoregression (VAR) decomposition for each country. A third variable in this group is the GDP growth rate, on the ground that in countries with higher GDP growth firms have more expansion opportunities and face a less severe effect of decreasing return to scale. The third group consists of six measures of corporate governance and investor protection, a measure of accounting quality, as well as an indicator of a country's legal origin. Finally, we consider three country-level measures of limits to arbitrage, based on idiosyncratic return volatility, stock trading liquidity, and short-sale restrictions.

Using the first group of country characteristics, we find that the asset growth effect is stronger in countries with higher capital market to GDP ratio, lower bank loan to GDP ratio, and lower R-squares. All these results, in a highly consistent way, suggest that the return-predictive power of asset growth is higher in countries with more efficient stock markets. This can hardly be reconciled with the hypothesis that the asset growth effect is due to mispricing, because one would expect mispricing to be more likely in less efficient markets.

[5]It is important to note that our inference does not rely on any single efficiency measure, but rather is reinforced by the consistent results from multiple efficiency measures. Despite supportive evidence provided by Morck, Yeung, and Wu (2000) and Dunev, Morck, and Yeung (2006), a few recent studies have questioned the validity of R-square as a negative measure of stock price efficiency; see, e.g., Chan and Hameed (2006), Kelly (2005), Ashbaugh-Skaife, Gassen, and LaFond (2006), Griffin, Kelly, and Nadari (2006), Hou, Peng, and Xiong (2007), and Teoh, Yang, and Zhang (2008).

Among the second group of country characteristics, the measure capturing the rational "discount-rate effect" is positively associated with the magnitude of the asset growth effect across countries. That is, in countries where asset growth is on average more sensitive to discount rate, the power of asset growth to predict future stock return is higher. This effect remains robust after we control for the first group of variables on market efficiency. However, the measures of the "cash flow effect" do not have cross-country explanatory power. This reveals that between the two channels through which investments affect expected returns, the discount-rate channel is the main driving factor of the asset growth effect.

Finally, we find that our third group of country-level characteristics, which measure corporate governance, investor protection, accounting quality, as well as legal origin, have virtually no power to explain the cross-country differences in the asset growth effect. This is inconsistent with various mispricing-based hypotheses, which predict that the asset growth effect is likely stronger among countries with lower governance, lower investor protection, and lower accounting quality. In addition, we find that the severity of limits to arbitrage – using our fourth group of country characteristic measures – does not significantly affect the magnitude of the asset growth-return relation, again inconsistent with the mispricing hypothesis. Such results perhaps are a bit surprising, given that several existing studies have shown that corporate governance and limits to arbitrage affect the asset growth effect in the U.S. market (e.g., Titman, Wei, and Xie, 2004; Lipson, Mortal, and Schill, 2009; Lam and Wei, 2009). The contrast suggests that the firm-level U.S. evidence in favor of a mispricing explanations does not carry over to explaining the cross-country differences in the asset growth effect.[6]

To sum, the main contribution of our paper is to document the existence of the asset growth effect in international stock markets and to provide informative evidence for assessing the validity of rational vs. mispricing hypotheses on this effect. As such, our study joins an expanding literature that looks at international evidence for various forms of stock return predictability originally documented in the US. However, so far there are only a few studies using country

[6] We also find that in the international data, stock-level measures of limits to arbitrage do not explain the magnitude of the asset growth effect in additional stock-level regressions. Therefore, the differences of the international results from the US-based results are not due to the use of country-level vs. stock-level analysis.

characteristics to evaluate validity of competing asset pricing hypotheses. In this aspect, a paper most related to ours is McLean, Pontiff, and Watanabe (2009), who analyze the negative cross-sectional relation between net share issuance and stock returns in international equity markets. Although firms' equity financing and asset growth are correlated phenomena, they do not subsume each other in predicting returns (Cooper et al. 2008). The relations between country characteristics and these two effects also exhibit some striking differences. To highlight, McLean et al. find that the share issuance effect is stronger in countries with greater issuance activity, stronger investor protection and less earnings management, consistent with a mispricing-based (market-timing, specifically) explanation.

The remainder of the paper is organized as follows. Section II describes the data. Section III provides evidence on the existence of the asset growth effect in international equity markets. Section IV performs cross-country analysis to link country characteristics to the asset growth effect. Finally, Section V concludes.

II. Data and Empirical Methodology

II.A. Data

Data on international stock returns and accounting information are obtained from Thomson-Reuter Datastream/WorldScope (hereafter "Datastream"). We start with all non-financial common stocks listed on each country's major stock exchange(s). To avoid survivorship bias, stocks in both active and defunct research files of Datastream are included. To avoid market microstructure issues in measuring returns, we exclude firms in the bottom 10 percentile of stock prices in each year of the sample period. In order to keep a meaningful size of the cross section for each country, for a given sample year we require a country to have no fewer than 30 stocks with valid observations of asset growth and market capitalization at the end of June; otherwise all observations for that country-year are excluded from the sample. We also perform initial data screening for coding errors via the methods outlined in Ince and Porter (2006). These selection criteria lead us to 40 stock markets outside the U.S. for the sample period from 1982 to 2006.

For comparison purpose we also include the U.S. market. The U.S. sample consists of common stocks from non-financial industries (excluding firms with four-digit SIC codes between 6000 and 6999) listed on NYSE, AMEX, and NASDAQ. We obtain the data from the Center for Research in Security Prices (CRSP) and the CRSP-Compustat merged annual data. Stocks with price below $5 at end of June of a year are excluded.

Table 1 provides summary statistics of our stock sample. Within the entire sample period from July of 1982 to June 2006, the actual sample starting dates vary across countries based on each country's data availability. The sample consists of 2,822,534 total firm-month observations when the U.S. market is included, and 1,864,036 excluding the U.S. As expected, the U.S. represents the largest part of the sample, accounting for over 30% of the total observations and over 30% of the total market capitalization on average. Japan is the second largest, accounting for 13% of the total observations and 13% of the total market value. The rest of the countries typically accounts for less than 5% of the total observations and market value.

Fama and French (1998) study the value premium in twelve developed stock markets (EAFE) outside the U.S. for the period from 1975 to 1995. They report that the number of stocks in the U.S. market is always ten times more than that in any of other twelve countries.[7] By comparison, the sample size reported in Table 1 represents a vast expansion of the international equity markets in recent decades. A few recent studies on international equity markets, such as Griffin, Martin, and Ji (2003), Hou, Karolyi, and Kho (2008), and McLean, Pontiff, and Watanabe (2009), report sample sizes similar to that of our study.

II.B. Measuring Asset Growth

Annual firm total asset growth rate (AG) is defined as year-over-year percentage change in total assets. The variable construction strictly follows Cooper et al (2008). That is, a firm's assets growth rate measured in June of year t is defined as the ratio of total assets for fiscal year ending

[7]The MSCI data used in Fama and French (1998) cover mainly large stocks, making it somewhat difficult to compare directly with our sample.

in calendar year t-1 to total assets for fiscal year ending in calendar year t-2, minus one:

$$\text{AG}_t = \frac{\text{Total Assets}_{t-1}}{\text{Total Assets}_{t-2}} - 1$$

In Datastream, the variable total assets is field 02999. For the U.S. data, in Compustat, the variable total assets is Data Item 6. To compute asset growth rate, we require a firm to have positive values for total assets in both fiscal years t-2 and t-1. We eliminate firms with AG greater than 1000% as coding errors. We further winsorize asset growth rate at the top and bottom 1% in each year across the entire sample to control for the influence of outliers.

Summary statistics on asset growth are provided in Table 2. In each year we compute the 25th percentile (P25), mean, median, 75th percentile (P75), and standard deviation for asset growth in each country, and report the time-series averages of these cross-sectional statistics. The standard deviation of AG range from 12.30% (Japan) to 442.76% (New Zealand). There are 11 countries with standard deviation of AG higher than that of U.S. (94.89%). Summary statistics on asset growth are also provided by region and developed/emerging market status. In Asia, for both developed and emerging markets, the cross-sectional standard deviation of asset growth is modestly low, as compared with that in the US. The relative homogeneity of asset growth in Asia is also noted by Chen et al. (2009). In all other regions and regardless of developed or emerging market status, the cross-sectional dispersion of asset growth is typically higher than that in the US.

Such large cross-sectional dispersion is noteworthy. For example, if we find that the effect of asset growth on stock return is weak in international markets, we can quickly rule out that the small magnitude of the effect is due to lack of dispersion in asset growth, an issue contemplated in Chen et al. (2009). The pattern is also in an interesting contrast with McLean et al. (2009), who find that lack of dispersion of share issuance activity – likely due to difficulty of issuing shares – is a reason for weak share issuance effect on stock returns in some countries.

III. Asset Growth and Stock Returns in International Markets

III.A. The Asset Growth Effect

In this section, we document the effect of asset growth on stock returns in the international markets. We first quantify the asset growth effect using sorted portfolios. Specifically, at the end of June of year t, within each country we sort stocks into deciles based on asset growth rates of year t. We form an equal-weighted portfolio for each decile and hold the portfolios for one year, from July of year t to June of year t+1. The D10 portfolio consists of stocks in the highest decile of asset growth rates and the D1 portfolio consists of stocks in the lowest decile of asset growth rates. Stock returns and portfolio returns are measured in both local currencies and US dollars, although our reported results are based on local currencies. It is well known that Datastream stock return data have coding errors. We follow the convention (e.g., McLean et al. 2009) and trimmed the top and bottom 1% of stock returns within each country. We do not trim the U.S. stock returns from CRSP.

We compute two portfolio based return measures for each country. The first is the return spread (SPREAD), the difference in the 1-year holding-period return (July of year t to June of year t+1) between the D10 and D1 portfolios (D10-D1). The second is the standardized return spread (STDSPREAD), computed as the return spread (SPREAD) between D10 and D1 portfolios divided by the asset growth spread between D10 and D1 portfolios (i.e., average AG for D10 minus average AG for D1, defined as AGSPREAD) for year t. The second measure, STDSPREAD, quantifies the effect of *per unit* of asset growth on stock returns.

We also provide a regression based measure, COEFF, which is the coefficient of regressing individual stock returns cross-sectionally onto asset growth within each country. The regression is run each year and the coefficients are then averaged over sample years to obtain COEFF.

Table 3 reports SPREAD, STDSPREAD, AGSPREAD, and COEFF averaged across geographical regions. SPREAD averaged across all countries outside the U.S. is -4.76%. Those for STDSPREAD and COEFF are -4.28% and -4.21%. They are all significantly negative. The table also reports the values for these variables when all stocks in markets outside the U.S. are pooled together to form portfolios and perform regressions. The corresponding numbers are -5.40%, -4.25%, and -4.59% respectively, again all significantly negative. Therefore, the asset growth effect on stock return exists in international stock markets. For comparison, the average SPREAD, STDSPREAD and COEFF in the U.S. market is -24.17%, -6.80%, and -3.56%.

The table also reports these statistics by region and by developed/emergig market status. A general pattern is that the asset growth effect is strong in developed markets and weak in emerging markets, with a few exceptions – it is significant in Africa (emerging market) and in Asian emerging markets, while insignificant in Asian developed markets.

The cross-country differences are graphically illustrated in Figures 1 to 3. Among the 40 countries outside the US, SPREAD range from -22.58% (Peru) to 10.88% (Portugal). Further, 27 countries have negative values, and 13 have positive values. The dispersion is large. A similar pattern is also apparent in STDSPREAD and COEFF. The values of STDSPREAD range from -32.00% (Pakistan) to 11.96% (Singapore). The values of COEFF range from -30.07% (Pakistan) to 18.30% (Mexico). The numbers of countries with negative and positive STDSPREAD are also 27 and 13, and those for COEFF are 31 and 9.

Although not tabulated, we have also performed analysis using U.S. dollar denominated stock returns by adjusting for exchange rates. The patterns are quite similar.

III.B. Variations and Robustness

In Table 4, we further examine the asset growth effect on stock returns at various holding horizons and under various weighting schemes. In this part of analysis we rely on the Fama and MacBeth (1973) regressions, which is flexible for multivariate analysis.

Holding periods include monthly and three annual horizons. At the monthly horizon, we regress monthly stock returns during each month from July of year t to June of year t+1 onto asset growth of year t. At annual horizon, we regress stock returns during three annual period – the first year (July of year t through June of year t+1), the second year (July of year t+1 through June of year t+2), and the third year (July of year t+2 through June of year t+3) –

onto asset growth of year t. The regressions are performed under both the equal-weight and value-weight schemes. The value weight is a firm's market capitalization at the beginning of the holding period examined scaled by the average market capitalization of the country it belongs to. Stock returns are measured in local currencies. But again, in untabulated analysis we obtain similar results when returns are measured in US dollars. For the annual return regressions, we use the procedure of Pontiff (1996) to calculate t-statistics with autocorrelation-consistent standard errors that correct for the holding period overlap.

Panel A of the table 4 reports the results for all countries excluding U.S. The observations across all countries are pooled together to perform cross-sectional regressions. For all regressions performed in this table as well as in Table 5 and Table 6, we include country dummies, although coefficients on these country dummies are not tabulated. The coefficients on AG are significantly negative at monthly horizon and for 1st-year returns, under both the equal-weighted and value-weighted schemes. However, the coefficients on AG for the 2nd-year returns and 3rd-year returns are insignificant. This is different from Cooper et al. (2008), who report that asset growth has return predictive power for at least three years after portfolio formation. The R^2s are relatively high in the table, because of the use of country dummies in regressions.

Panel B reports the results for developed countries. The pattern is quite similar to that for all countries included (Panel A). By contrast, the results for emerging markets are much weaker. As reported in Panel C, when we pool all observations in emerging markets together, the coefficient on AG is only significant in the equal-weighted regression at monthly horizon. It is fair to say that the asset growth is mainly a developed-market phenomenon.

We further perform multivariate Fama-MacBeth regressions to control for the return-predictive effects of several important firm characteristics. In addition to asset growth, we include logMV, logBM, and BHRET5, representing the size, value, and momentum effects. These variables are constructed following McLean et al. (2009). Specifically, logMV is the natural logarithm of market capitalization at the end of June of year t. logBM is the natural logarithm of the book value of equity for the fiscal year ending in year t-1 divided by the market value of equity in June of year t. BHRET5 is the stock return from January of year t to May of year t. The regressions are performed at three different holding horizons – monthly and three annual horizons. Both equal-weighting and value-weighting schemes are used.

The results are reported in Table 5. The coefficient for AG remains significantly negative at the monthly horizon and for 1st-year returns, under both equal-weighted and value-weighted schemes. Its coefficient is again insignificant for the case when the 2nd-year and 3rd-year returns are dependent variables. The coefficient for logMV is never significant. On the other hand, the coefficient for logBM is always significantly positive. This is consistent with Fama and French (1998), who report the existence of the value premium in international markets (they also mention the non-existence of the size effect in international markets). The coefficient for BHRET5 is also always significantly positive, indicating the existence of the international momentum phenomenon (Rouwenhorst 1998; Griffin, Martin, and Ji, 2003).

III.C. Effects of Asset Growth Components on Stock Returns

Following Cooper et all (2008), we further decompose asset growth into the growth of various components on the assets side of the balance sheet:

$$\begin{aligned} \text{AG} &= \text{Cash Growth } (\Delta\text{Cash}) \\ &\quad + \text{Non-cash Current Asset Growth } (\Delta\text{CurAsset}) \\ &\quad + \text{Net Fixed Assets Growth } (\Delta\text{PPE}) \\ &\quad + \text{Other Assets Growth } (\Delta\text{OthAsset}) \end{aligned}$$

We further decompose AG into various components on the liability and equity side items of the balance sheet:

$$\begin{aligned} \text{AG} &= \text{Operating Liabilities Growth } (\Delta\text{OpLiab}) \\ &\quad + \text{Debt Financing } (\Delta\text{Debt}) \\ &\quad + \text{Equity Financing } (\Delta\text{Equity}) \\ &\quad + \text{Retain Earnings Growth } (\Delta\text{RE}) \end{aligned}$$

In Datastream, the variables involved are defined the in the following way. On the assets side, cash is field 02001, non-cash current assets is the difference between field 02201 and field 02001, and net fixed assets is field 02501. Other assets is total assets (field 02999) minus all the above assets categories. On the liability and equity side, operating liabilities is the difference between field 02999 and the sum of fields 03451, 03501, 03426, and 03255. Equity is the total of fields 03451, 03501, and 03426. Retained earnings is field 03495. To maintain an asset growth identity, the growth of each component is the difference of the component from previous year scaled by the previous year total asset value, such that the sum on each side equals the contemporaneous total asset growth for that firm.[8] Each asset growth component is cross-sectionally winsorized at the top and bottom 1% in each year.

In Panel A of Table 6, we report cross-sectional statistics on various asset growth components. The statistics include mean, standard deviation, 25th percentile, median and 75th percentile. Observations from all countries outside the U.S. are pooled together each year to obtain these statistics.

In Panel B of Table 6, we report results from Fama-MacBeth regressions, where we regress future stock returns onto asset growth components on the assets side jointly, and onto asset growth components on the liabilities and equity side jointly. Country dummies are included. The horizons are for monthly returns and for the 1st-year returns. We also use both equal and value weighting schemes. On the assets side, return predictive power comes from ΔCurAsset,ΔPPE, and ΔOthAsset, but mainly at the monthly horizon. On the liabilities and equity side, return predictive power exists for ΔEquity and ΔDebt, for all return horizons and under both weighting schemes. Interestingly, the coefficient for ΔOpLiab is significantly positive.

[8]In the Compustat data for US, on the assets side, cash is Data Item 1. Non-cash current assets is Data Item 4 less Data Item 1. Net fixed assets is Data Item 8. Other assets is total assets less all the above asset categories. On the liability and equity side, retained earnings is Data Item 36. Stock financing is Data Item 130 plus Data Item 60 plus Data Item 38 less Data Item 36. Debt financing is Data Item 34. Operating liabilities is total assets less all the above categories of liabilities and equity.

IV. Cross-country Analysis

IV.A. Hypotheses, Country Characteristics, and Regression Specification

IV.A.1. Hypotheses and Country Characteristics

This part of analysis explores whether the asset growth effect is due to market inefficiency or can be viewed as a rational asset pricing result. The rational hypothesis posits that higher asset growth is associated with lower expected return via both the decreasing return to scale channel and the discount rate channel; see, e.g., Cochrane (1991, 1996), Lyandres, Sun, and Zhang (2008), and Li, Livdan, and Zhang (2009).

On the other hand, the mispricing hypothesis posits that investors may under-react to corporate over-investment and empire-building tendency (Titman, Wei, and Xie, 2004), to opportunistic external financing activities (Baker and Wurgler, 2002), or to earnings management prior to financing activities (Teoh, Welch, Wong, 1998a; 1998b). In addition, investors may excessively extrapolate on past growth when they value firms (e.g., Lakonishok, Shleifer, and Vishny, 1994). These effects can give rise to the negative relation between asset growth and future stock returns.

We consider a rich set of variables to differentiate between the rational stories and mispricing-based explanations. Specifically, four groups of variables are considered: i) proxies for information efficiency, ii) measures of the cash-flow channel effect and the discount rate channel effect, iii) corporate governance and investor protection indices, and iv) measures of limits to arbitrage. We briefly discuss the variables and their relevance to our hypotheses below, with details of variable constructions provided in Appendix B.

The first set of variables proxies for the average stock price informativeness in a market, including R2, MKT, BANK, and MKT/BANK. R2 is the R^2 of regressing returns of individual stocks on market returns. According to Roll (1988), Morck, Yeung, and Yu (2000), and Durnev, Yeung, and Zarowin (2003), R2 is inversely related to the pricing efficiency of a stock market.

Following this logic, we expect a weaker asset growth effect in high R2 countries under the rational hypothesis. That is, the rational investment effect may be more visible in a more price-informative environment. On the other hand, if the AG effect is due to mispricing, a less efficient capital market would fail to correct mispricing quickly and a positive relation between the AG effect and R2 is expected. Next, MKT and BANK are, respectively, market capitalization of publicly listed companies and total outstanding bank credit to private sector of a country, as percentages of the country's GDP. To further capture the relative importance of the capital market and the banking sector, we also define a relative measure MKT/BANK. Our premise is that information efficiency is expected to be high in capital market-based countries, while relatively low in bank-dominated financial systems. As a result, we expect a positive (negative) relation between MKT (BANK) and the AG effect under the rational hypothesis, while an opposite relation holds under the mispricing hypothesis.

The second set of variables intends to capture the "cash-flow channel" and "discount rate channel" effects described by the rational investment model, for each country. We first use the simple VAR as described in appendix and run panel regressions controlling for firm fixed effects within each country. Then we calibrate the model and calculate the decomposition β_{cf} and β_r from the implied predictive regression slope coefficient for each country. We also use country's GDP growth (ΔGDP) to proxy for the decreasing return to scale. Their relation with the magnitude of the AG effect is expected to be positive if these measures capture the driving forces from the rational investment theory. In contrast, they play no roles in the mispricing hypothesis.

The third set of variables evaluates corporate governance and investor protection. They include six indicators from the Worldwide Government Index (WGI) – voice and accountability (VOICE), political stability and absence of violence (STABILITY), government effectiveness (EFFECTIVE), regulatory quality (QUALITY), rule of law (LAW), control of corruption (CORRUPT). We additionally include accounting quality (ACCOUNTING) from La Porta, Lopez-de Silanes, Shleifer and Vishny (2000, hereafter LLSV). As more effective corporate governance reduces over-investments and managerial market timing, we expect a negative relation between these variables and the magnitude of the AG effect under the mispricing hypothesis.

Moreover, we consider country legal origin as an indicator of the country's investor protection and corporate governance effectiveness. In this category, we create dummies for four major legal traditions, denoted as LEGOR_UK, LEGOR_FR, LEGOR_GE, and LEGOR_SC. As documented by LLSV (2000), countries with English legal origin typically are more effective in corporate governance. We therefore expect a negative relation between LEGOR_UK and the magnitude of the AG effect under the mispricing hypothesis.

The fourth set of variables gauges limits to arbitrages. The measures include idiosyncratic volatility (IVOL), turnover (TURNOVER), and short sale restrictions (SHORTSALE). Arbitrage risk, information cost, and illiquidity limits investors' ability to engage in arbitrage trading on mispriced securities. As such, we expect countries with higher level of threshold to perform arbitrage (represented by greater idiosyncratic volatility, lower turnover, and tighter constraints on short sale) would have stronger AG effects under the mispricing hypothesis. We do not expect a direct relation between limits to arbitrage and the asset growth effect under the rational hypothesis.

IV.A.2. Regression Specification

To better understand the international evidence of asset growth effect, we follow Karolyi et al. (2007) and conduct a series of ordinary least squares (OLS) estimations. Our dependent variables include return spread (SPREAD), standardized return spread (STDSPREAD), and return predictive regression coefficient of asset growth (COEFF). Specifically, we take the time-series average of these values from countries then run cross-sectional regressions on various country characteristics. We also take the average of the independent variables, except that β_{cf} and β_r are time-invariant already. For the cross country analysis we run univariate regression first then consider the joint explanatory power of these variables. Finally in drawing statistical inferences we use conservative Jackknife standard errors with the consideration that some of our dependent and independent variables are from estimations rather than direct observations. [9]

[9] We also run the weighted least squared (WLS) regressions of return spread with weights proportional to their standard deviations within each country. The results are similar and available upon request

IV.B. Analysis Based on Price Informativeness

We first examine the cross-country relation between price informativeness and the asset growth effect. The dependent variables are SPREAD, the decile return spread between the top and bottom asset growth decile portfolios in each country, STDSPREAD, the decile return spread scaled by the difference in asset growth between the top and bottom deciles, and COEFF, the coefficient obtained from cross-sectionally regressing stock returns onto asset growth at stock level. The explanatory variables include R2, MKT, BANK, and MKT/BANK. Since our dependent variables capture the *negative* asset growth-return relationship, therefore under the mispricing hypothesis, the regression coefficient should be negative for R2 and BANK, and positive for MKT and MKT/BANK. That is, a stronger AG effect is accompanied by less efficient information environment proxied by high R2 and better developed banking sector. Under the rational hypothesis, the predicted signs of the coefficients are exactly the opposite. Before reporting empirical results, we note that the conclusion is somewhat foreshadowed by the earlier results on the asset growth effect in developed markets vs. emerging markets separately – Table 4 shows that the asset growth effect is significant in developed markets, and weak in emerging markets.

Table 7 reports the regression results. First consider the case when the dependent variable is SPREAD. When R2 is the only explanatory variable, its coefficient is significantly positive, suggesting that the asset growth effect is weaker among countries with higher R2, i.e., when stock prices are less informative. In the next regression specification we include both MKT and BANK. The coefficient for MKT is significantly positive and that for BANK is significantly negative. Since MKT is positively correlated, and BANK is negatively correlated, with pricing efficiency, the result again suggests that the asset growth effect is stronger in countries with more efficient stock prices. Moreover, when we combine MKT and BANK into the MKT/BANK ratio, the coefficient is significantly negative, consistent with the result when MKT and BANK are separately used as explanatory variables. Finally, when R2 is jointly used with MKT and BANK, or with MKT/BANK, the coefficients for these explanatory variables are all significant.

The results are quite similar when the dependent variables are STDSPREAD and COEFF.

Overall, the results based on the first group of country characteristics are not supportive of the mispricing hypothesis, but rather are consistent with the rational hypothesis. We should note that the conclusion is not based on a single explanatory variable such as R2, but is reinforced by multiple measures of price informativeness, as well as supported by informal analysis based on the developed markets and emerging markets classification of Table 4. This is important because several recent studies have questioned the validity of R-square as a negative measure of stock price efficiency; see, e.g., Chan and Hameed (2006), Kelly (2005), Ashbaugh-Skaife, Gassen, and LaFond (2006), Griffin, Kelly, and Nadari (2006), Hou, Peng, and Xiong (2007), and Teoh, Yang, and Zhang (2008).

IV.C. Analysis Based on Cash Flow Channel and Discount Rate Channel

β_{cf} and β_r in the second group of country characteristics are measured via a VAR system, under the assumption of present-value relationship and motivated from a simple rational investment model as in Li, Livdan and Zhang (2009). The mispricing hypothesis has no prediction regarding how these two variables and country GDP growth rate (ΔGDP) should be related to the magnitude of the asset growth effect. The rational hypothesis, in contrast, predicts that when regressing SPREAD, STDSPREAD, or COEFF onto these variables, the coefficient for β_{cf} should be negative and the coefficient for ΔGDP should be positive if the cash flow channel is effective in driving the investment-return relation, and the coefficient for β_r should be negative if the discount rate channel is effective.

The regression results are reported in Table 8. It turns out that the coefficients for measures of the cash flow channel effect, β_{cf} and ΔGDP, are never statistically significant, regardless of the dependent variable. We thus conclude that the cash flow channel, i.e., the decreasing return to scale effect, does not significantly affect the magnitude of the asset growth effect. The coefficient for β_r, on the other hand, always are significantly negative for all three dependent variables. Therefore, the discount rate effect (i.e., the effect of capital adjustment cost) seems to be the main driving force of the asset growth effect across countries.

We additionally include the price informativeness measures, i.e., the first group of country characteristics together with β_{cf}, GDP growth rate, and β_r. The results, also reported in the table, are largely unchanged. That is, only β_r is significant in explaining cross-country differences in the asset growth effect.

In untabulated analysis, we classify countries in our sample into two groups based on R2, MKT/BANK, and developed/emerging market status, and then examine the coefficient of β_{cf} separately in the two groups of countries. The purpose of the analysis is to see if the effect of decreasing return to scale on the asset growth-return relation is more visible in developed countries and countries with more efficient stock markets. We do not find such evidence. The coefficient for β_{cf} is insignificant in any subsamples of countries we examine.

Overall, this part of the analysis provides evidence consistent with the rational hypothesis and pinpoints a particular form of the investment effect at play – the discount rate channel.

IV.D. Analysis Based on Corporate Governance, Legal Origin, and Accounting Quality

The third group of country characteristics consists of measures of corporate governance and investor protection (VOICE, STABILITY, EFFECTIVE, QUALITY, LAW, CORRUPT), the legal origin of a country (UK, FR, GE, and SC), and accounting quality (ACCOUNTING). Under the mispricing hypothesis, the asset growth effect should be weaker in countries with more effective governance mechanisms, stronger investor protection, and better accounting quality, and with UK legal origin.

The rational hypothesis does not have a direct prediction on how these country characteristics would affect the asset growth effect. However, there might be an indirect effect. Countries with stronger corporate governance and investor protection tend to develop larger and stronger capital markets, and so do countries with UK legal origin. There may also be a positive correlation between accounting quality and price informativeness. Therefore, the rational hypothesis indirectly predict that these country characteristics are related to the asset growth effect, but in a direction to the opposite of what is predicted by the mispricing hypothesis. However, since this is only an indirect effect, we do not expect it to be as strong as that of direct measures of price informativeness (i.e., those in the first group of country characteristics).

Panels A to C of Table 9 report the univariate regression results when the dependent variables are SPREAD, STDSPREAD, or COEFF respectively. The coefficients for the country characteristics in this group are mostly insignificant, with only three exceptions – when the dependent variable is COEFF, the coefficients for EFFECTIVE, QUALITY, and ACCOUNTING are significantly positive. However, in untabulated analysis, once we include the price informativeness characteristics (those analyzed in Table 7), the coefficients for the above three variables quickly become insignificant in the regression involving COEFF.

Therefore, corporate governance, investor protection, legal origin, or accounting quality do not seriously matter in explaining cross-country differences in the magnitude of the asset growth effect, inconsistent with the mispricing hypothesis.

IV.E. Analysis Based on Limits to Arbitrage

The last group of country characteristics (IVOL, TURNOVER, and SHORTSALE) measures limits to arbitrage. Under the mispricing hypothesis, the asset growth effect should be weaker in countries with less severe frictions on arbitrage activities, i.e., with lower idiosyncratic stock return volatility, higher liquidity, and less short-sale constraints.

Again, rational hypothesis does not clearly indicate how these variables should affect the asset growth effect. Still, there is an indirect channel. Stock prices correspond more to their fundamental values when limits to arbitrage are less severe. Therefore, similar to the prediction by the rational hypothesis that the asset growth effect should be stronger in countries with more informative stock prices, these effects should also be stronger when limits to arbitrage are less severe, albeit via an indirect effect.

Table 10 reports the results. None of the three variables associated with limits to arbitrage has explanatory power on the asset growth effect across countries. Therefore, again the evidence fails to provide support to the mispricing hypothesis.

To sum up, the evidence reported in this section suggests that the asset growth effect is stronger in countries with more informative stock prices and with a higher value of the measure capturing the "discount rate effect". This is consistent with the rational investment effect. On the other hand, there is no strong evidence that the asset growth effect is stronger in countries with weaker corporate governance and investor protection, poorer accounting quality, or more severe limits to arbitrage. Therefore, the predictions from the mispricing hypothesis do not materialize in the data.

V. Conclusion

This study makes two contributions. First, we document the existence of a negative relation between asset growth and future stock returns in 40 international equity markets outside the US. Thus we show that the asset growth effect initially documented by Cooper et al. (2008) for the U.S. market is a pervasive international phenomenon.

Our second contribution is to provide informative evidence for evaluating mispricing vs. rational asset pricing explanations for the asset growth effect. The 40 countries we examine exhibit large differences in various characteristics, in terms of market efficiency, features of corporate governance and investor protection, accounting quality, legal origin, as well as market frictions that may serve as limits to arbitrage. Competing hypotheses predict in different ways how these country characteristics may be related to the magnitude of the asset growth effect. Therefore a country-level analysis can produce powerful evidence, and such analysis is not substitutable by a stock level analysis within any single country.

We find that the country characteristics with most power to explain the magnitude of the asset growth effects are those related to the price informativenss in the stock market. Countries with more informative stock prices exhibit a stronger asset growth effect. Further, a measure capturing the "discount rate channel" of the rational investment effect also has explanatory power. These results are consistent with a rational hypothesis, but inconsistent with a mispricing hypothesis. Finally, we find that two additional predictions by the mispricing hypothesis fail to materialize in evidence – there is no relation of the asset growth effect with either the governance characteristics or limits to arbitrage measures.

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Appendix A: Measuring “Cash Flow Effect” and “Discount Rate Effect”

Studies on rational investment-based models have proposed two channels through which higher investments are associated with lower stock returns. The first is dubbed “the discount rate channel”. All else equal, low discount rates mean high marginal q and high investment, and high discount rates mean low marginal q and low investment. The second is dubbed “the cash flow channel”, namely, the decreasing return to scale efect. These two channels are illustrated in a recent study by Li Livdan and Zhang (2009) using a two-period Q-theory model of investments with adjustment cost. In their model, the cash flow channel works through decreasing returns to scale, and the discount rate channel works through capital adjustment costs:

$$\frac{\partial r}{\partial i} = \underbrace{\frac{\alpha\left(\alpha-1\right)k_2^{\alpha-2}}{1+a\left(i/k_1\right)}}_{cashflow\ channel} - \underbrace{\frac{\alpha k_2^{\alpha-1}a}{[1+a\left(i/k_1\right)]^2 k_1}}_{discount\ rate\ channel} < 0$$

In this study we use VAR to estimate both the cash flow effect and the discount rate effect of asset growth (investment) for each country. The approach does not rely on structural assumptions about the production function or adjustment cost function, but rather relies on the present value relation and log-linearization. In the following we provide a brief description of the approach. Since our set-up is quite similar to Larrain and Yogo (2008), we refer readers to their paper for many of the details.

A.1 Intertemporal Budget

The setup follows Larrain and Yogo (2008). Let Y_{t+1} be earnings net of taxes and depreciation, I_{t+1} investment net of depreciation (both capital expenditures on property, plant, and equipment and investment in working capital), A_{t+1} total asset, E_{t+1} net payout (the net cash outflow from the firm, composed of dividends, interest, equity repurchase net of issuance, and debt repurchase net of issuance), R_t the return on assets, C_t/A_t net payout yield. We start from the intertemporal budget

$$A_{t+1} = A_t + I_{t+1} = A_t + Y_{t+1} - E_{t+1}$$

Then by definition return on assets

$$R_{t+1} = 1 + \frac{Y_{t+1}}{A_t} = \frac{A_{t+1}+E_{t+1}}{A_t} = \frac{A_{t+1}+E_{t+1}}{E_{t+1}}\frac{E_{t+1}}{E_t}\frac{E_t}{A_t}$$

A.2 Log-linearization and VAR

With lower case letters as log of upper case letters, and leaving out constants in expressions, log-linearization yields:

$$r_{t+1} \simeq \rho \Delta a_{t+1} + (1-\rho)(e_{t+1} - a_t)$$
$$\rho = \frac{1}{1+\exp[E(e-a)]}$$
$$e_t - a_t = E_t \sum_{j=1}^{\infty} \rho^{j-1} r_{t+j} - E_t \sum_{j=1}^{\infty} \rho^{j-1} \Delta e_{t+j}$$
$$\Delta a_{t+1} = \frac{1}{\rho} r_{t+1} + \left(1 - \frac{1}{\rho}\right) \Delta e_{t+1} - \left(1 - \frac{1}{\rho}\right)(a_t - e_t)$$

Now consider the following VAR system:

$$\begin{aligned} r_{t+1} &= a_r + b_r (e_t - a_t) + \varepsilon^r_{t+1} \\ \Delta e_{t+1} &= a_e + b_e (e_t - a_t) + \varepsilon^e_{t+1} \\ e_{t+1} - a_{t+1} &= a_{ea} + \phi (e_t - a_t) + \varepsilon^{ea}_{t+1} \\ r_{t+1} &= \rho(a_{t+1} - e_{t+1}) + \Delta e_{t+1} - (a_t - e_t) \end{aligned}$$

where

$$\begin{aligned} b_r &= 1 - \rho\phi + b_e \\ \varepsilon^r_{r+1} &= \varepsilon^e_{t+1} - \rho \varepsilon^{ea}_{t+1} \\ \varepsilon^{ea}_{t+1} &= \frac{1}{\rho}\left(\varepsilon^e_{r+1} - \varepsilon^r_{t+1}\right) \end{aligned}$$

The system has a redundant equation. We can estimate only two or all three by overidentified GMM. therefore we have

$$\begin{bmatrix} \varepsilon^r_{r+1} \\ \varepsilon^e_{t+1} \\ \varepsilon^{ea}_{t+1} \end{bmatrix} \sim \left(\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} \sigma_r^2 & \sigma_{r,e} & \frac{1}{\rho}\left(\sigma_{r,e} - \sigma_r^2\right) \\ \sigma_{r,e} & \sigma_e^2 & \frac{1}{\rho}\left(\sigma_e^2 - \sigma_{r,e}\right) \\ \frac{1}{\rho}\left(\sigma_{r,e} - \sigma_r^2\right) & \frac{1}{\rho}\left(\sigma_e^2 - \sigma_{r,e}\right) & \frac{1}{\rho^2}\left(\sigma_r^2 - 2\sigma_{r,e} + \sigma_e^2\right) \end{bmatrix} \right)$$

A.3 Measures of Cash Flow Effect and Discount Rate Effect

It can be then shown that, in the VAR system described above, when regressing r_{t+2} onto Δa_{t+1}, the coefficient β has the following expression:

$$\beta = \frac{Cov(r_{t+2}, \Delta a_{t+1})}{Var(\Delta a_{t+1})} = \beta_r + \beta_{cf} + \beta_{r,fc}$$

where

$$\begin{aligned}
\beta_r &= \underbrace{\frac{\left(\frac{1}{\rho}b_r^2 + \left(1-\frac{1}{\rho}\right)(b_r b_e + b_r)\right)\phi\frac{1}{\rho^2}\frac{\sigma_r^2}{1-\phi^2} + \frac{b_r}{\rho^2}\sigma_r^2}{Var\left(\Delta a_{t+1}\right)}}_{discount\ rate\ channel} \\
\beta_{cf} &= \underbrace{\frac{\left(\frac{1}{\rho}b_r^2 + \left(1-\frac{1}{\rho}\right)(b_r b_e + b_r)\right)\phi\frac{1}{\rho^2}\frac{\sigma_e^2}{1-\phi^2} + b_r\left(\frac{\rho-1}{\rho^2}\right)\sigma_e^2}{Var\left(\Delta a_{t+1}\right)}}_{cashflow\ channel} \\
\beta_{r,cf} &= \underbrace{\frac{-\left(\frac{1}{\rho}b_r^2 + \left(1-\frac{1}{\rho}\right)(b_r b_e + b_r)\right)\phi\frac{1}{\rho^2}\frac{2\sigma_{r,e}}{1-\phi^2} + b_r\left(\frac{\rho-1}{\rho^2}\right)\sigma_{r,e}}{Var\left(\Delta a_{t+1}\right)}}_{interaction}
\end{aligned}$$

and

$$\begin{aligned}
Var\left(\Delta a_{t+1}\right) &= \frac{1}{\rho^2}\left(b_r^2\frac{\sigma_{ea}^2}{1-\phi^2} + \sigma_r^2\right) + \left(1-\frac{1}{\rho}\right)^2\left(\left(b_e+1\right)^2\frac{\sigma_{ea}^2}{1-\phi^2} + \sigma_e^2\right) \\
&\quad + \frac{2(\rho-1)}{\rho^2}\left(b_r\left(b_e+1\right)\frac{\sigma_{ea}^2}{1-\phi^2} + \sigma_{e,r}\right)
\end{aligned}$$

Intuitively, β_r captures the discount rate channel. As in Cochrane (1991), it works through capital adjustment cost. β_{cf} captures the cashflow channel, which works through decreasing return to scale in Li Livdan and Zhang (2009). $\beta_{r,cf}$ is an interaction term between the discount rate effect and the cash flow effect, which does not appear in Li Livdan and Zhang (2009) since theirs is a one-period optimization problem.

Appendix B: Country Characteristic Variables

- Information Efficiency Proxies.

  - R2: R^2 of the regression of weekly returns of individual stocks on market returns in a country. Following Jin and Myers (2006), Karolyi et al (2007), we follow the Dimson (1979) procedure to control for the non-synchroneous trading effect by including the lead and lag of market return in the market model. We run regression for each stock for every year. Then we take the average of each firm's value every year for a time series of an aggregate measure. We then average individual firm R^2 in a year to obtain the country's averaged R^2.
  - MKT: The percentage of market capitalization of listed companies of a country in its GDP. Data from World Bank development index database from 1980 to 2006.
  - BANK: The percentage of outstanding bank credit to proviate sector of a country in its GDP. This measure is widedly used for excluding credits issued for non-economical reasons. Data from World Bank development index database from 1980 to 2006.
  - MKT/BANK: The ratio of market capitalization of listed companies to bank credit to private sector.

- "Cash flow channel effect" and "discount rate channel effect"

  - β_{cf} and β_r: We use the simple VAR outlined in appendix A to capture these two channels. Specifically we run panel regressions controlling for firm fixed effects within each country in order to reach an aggregate measure on the country level. Our VAR system has three equation, and in the first two predictive regressions we use within estimation (fixed effects) and regress ROA ("discount rate") and net payout growth ("cash flow growth") on lagged net payout yield. The last predictive regression is a panel first-order autoregression on net payout yield thus requires a more sophiscated Arellano-Bond GMM system estimator. In order to calculate steady state net payout yield we average the cross sectional time series values within each country. Given that one of the equation is redundant, and the slope coefficients in the first regression is least significant so we choose the point estimates from other two regressions then calibrate. Then we calculate the decomposition β_{cf} and β_r from the implied predictive regression slope coefficient β for each country.

- Corporate Governance, Investor Protection, and Legal Origin

  - VOICE (Voice and Accountability): Measuring perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000, 2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable construction see Kaufmann, Kraay, and Mastruzzi (2007).
  - STABILITY (Political Stability and Absence of Violence): Measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000,

2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable construction see Kaufmann, Kraay, and Mastruzzi (2007).

- EFFECTIVE (Government Effectiveness): Measuring perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000, 2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable construction see Kaufmann, Kraay, and Mastruzzi (2007).
- QUALITY (Regulatory Quality): Measuring perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000, 2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable construction see Kaufmann, Kraay, and Mastruzzi (2007).
- LAW (Rule of Law): Measuring perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000, 2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable construction see Kaufmann, Kraay, and Mastruzzi (2007).
- CORRUPT (Control of Corruption): Measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. It is a worldwide government index (WGI), measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. WGI data are for 1996, 1998, 2000, 2002 through 2006. We use the value in 1996 for years before 1996 and use the averages of two neighboring years for 1997, 1999, and 2001. Details on variable constructions see Kaufmann, Kraay, and Mastruzzi (2007).
- ACCOUNTING: We use LLSV's (1998) accounting index of accounting standards where a higher value represents better accounting standards. The index is based on the reporting or omission of 90 items from annual reports.
- LEGOR_UK: An indicator on a country's English legal origin, equaling 1 for a country with English legal origin. We obtain the data from Andrei Shleifer's website.[10] English origin countries typically are more effective in corporate governance (LLSV, 2000).
- LEGOR_FR: An indicator on a country's French legal origin, equaling 1 for a country with French legal origin. Relative to English origin countries, French origin countries are less effective in corporate governance (LLSV, 2000).
- LEGOR_GE: An indicator on a country's German legal origin, equaling 1 for a country with German legal origin. Relative to English origin countries, German origin countries are less effective in corporate governance (LLSV, 2000).

[10] Andrei Sheifer's website: http://www.economics.harvard.edu/faculty/shleifer/dataset.

- LEGOR_SC: An indicator on a country's Scandinavian legal origin, equaling 1 for a country with Scandinavian legal origin. Relative to English origin countries, Scandinavian origin countries are less effective in corporate governance (LLSV, 2000).

- Limits to Arbitrage
  - IVOL (Idiosyncratic volatility): Measured by each firm's idiosyncratic volatility given by the standard deviation of CAPM residuals using past 3-fiscal-year monthly return data.
  - TURNOVER: Measured by each firm's average monthly share turnover during the previous fiscal year. Turnover is the total dollar value of stocks traded, scaled by the value of shares outstanding, for the period 1996–2000.
  - SHORTSELL: A dummy variable equal to 1 if short selling is allowed and zero if it is not allowed. We obtained this measure from Bris, Goetzmann, and Zhu (2007). Following Mclean, Pontiff and Watanabe (2009), if short selling was legal prior to 1990, we assume that short selling was allowed in each of the years prior to 1990. Short sale constraints reduce the ability of sophisticated traders to induce corrective price pressure.

Table 1: Summary Statistics of Stock Sample

Country	Start Date (yyyymm)	End Date (yyyymm)	Total Number of Firm-Month obs	Pct Total Sample (%)	Avg Number of Firm Obs per Month	Monthly Average Pct of Sample (%)	Avg Monthly Total Market Value (US$ Mill)	Avg Monthly Pct of Total Market Value (%)
Argentina	199807	200606	4,659	0.17	49	0.50	32,060	0.38
Brazil	199607	200606	40,930	1.45	341	3.48	142,339	1.69
Chile	199307	200606	14,796	0.52	95	0.97	45,448	0.54
Mexico	199201	200606	16,165	0.57	93	0.95	92,404	1.10
Peru	199507	200606	6,110	0.22	60	0.61	6,872	0.08
South Africa	198705	200606	33,419	1.18	145	1.48	76,066	0.90
Israel	199907	200606	3,815	0.14	50	0.51	19,345	0.23
Greece	199011	200606	28,157	1.00	150	1.53	28,977	0.34
Poland	199807	200606	6,301	0.22	66	0.67	14,841	0.18
Portugal	199009	200606	9,656	0.34	51	0.52	26,360	0.31
Turkey	199507	200606	12,478	0.44	95	0.96	25,112	0.30
China	199607	200606	71,247	2.52	604	6.16	200,647	2.38
India	199407	200606	35,058	1.24	243	2.48	98,002	1.16
Indonesia	199307	200606	21,683	0.77	139	1.42	24,534	0.29
Malaysia	198607	200606	55,806	1.98	240	2.44	59,714	0.71
Pakistan	199507	200606	7,281	0.26	55	0.56	7,095	0.08
Philippines	199307	200606	14,083	0.50	90	0.92	17,173	0.20
South Korea	199007	200606	65,238	2.31	340	3.47	85,498	1.01
Taiwan	199507	200606	40,763	1.44	309	3.15	176,425	2.09
Thailand	199307	200606	32,839	1.16	211	2.15	36,180	0.43
Australia	198207	200606	72,759	2.58	253	2.58	97,250	1.15
New Zealand	199607	200606	6,291	0.22	57	0.58	18,717	0.22
Canada	198207	200606	110,610	3.92	384	3.92	229,966	2.73
Hong Kong	198707	200606	54,296	1.92	238	2.43	122,985	1.46
Japan	198207	200606	364,104	12.90	1,264	12.90	1,648,770	19.54
Singapore	198907	200606	28,457	1.01	139	1.42	66,397	0.79
Austria	198910	200606	11,082	0.39	55	0.57	20,790	0.25
Belgium	198907	200606	15,466	0.55	76	0.77	48,585	0.58
Denmark	198907	200606	24,547	0.87	120	1.23	47,475	0.56
Finland	198807	200606	17,871	0.63	87	0.89	53,978	0.64
France	198207	200606	102,637	3.64	356	3.64	407,059	4.82
Germany	198207	200606	87,011	3.08	302	3.08	317,247	3.76
Ireland	199107	200606	7,426	0.26	41	0.42	25,432	0.30
Italy	198602	200606	44,166	1.56	180	1.84	179,266	2.12
Netherlands	198207	200606	29,428	1.04	102	1.04	156,845	1.86
Norway	198907	200606	22,788	0.81	112	1.14	44,069	0.52
Spain	198907	200606	16,861	0.60	83	0.84	159,823	1.89
Sweden	198402	200606	41,147	1.46	153	1.56	89,896	1.07
Switzerland	198207	200606	38,760	1.37	135	1.37	55,100	0.65
UK	198207	200606	247,845	8.78	861	8.78	681,972	8.08
US	198207	200606	958,498	33.96	3,328	33.96	3,529,426	41.84
All	198207	200606	2,822,534	100.00	9,800	100.00	8,436,488	100.00
All excluding U.S.	198207	200606	1,864,036	66.04	6,472	66.04	4,907,063	58.16
Developed	198207	200606	2,302,050	81.56	7,993	81.56	7,792,677	92.37
Developed ex. U.S.	198207	200606	1,343,552	47.60	4,665	47.60	4,263,251	50.53
Emerging	198607	200606	520,484	18.44	2,224	22.70	792,383	9.39

This table provides summary statistics for the 41 countries included in our sample. Columns 2 and 3 list the beginning and ending dates during which each country is included in our regression analysis. The total number of firm-month observations is reported in column 4 and the average number of firm observations per month is reported in column 6. The values of these statistics represented as percentages of the corresponding total across countries are given in columns 5 and 7. The average monthly total market capitalization in millions of U.S. dollars is given in column 8, while the percentage that each country's total market capitalization represents of the total is displayed in column 9.

Table 2: Summary Statistics on Asset Growth

Region	Country	P25	Mean	Median	P75	Stdev
Asia-Emerging	Thailand	-2.28	13.44	8.58	24.72	29.69
Asia-Emerging	*Region Average*	0.06	19.82	10.45	25.50	81.72
Australia - Developed	Australia	-7.88	34.83	6.42	29.45	134.58
Australia - Developed	New Zealand	-6.58	67.40	3.80	17.07	442.76
Australia - Developed	*Region Average*	-7.74	37.08	6.03	27.61	218.87
Europe-Developed	Germany	-4.85	26.60	4.97	22.39	91.17
Europe-Developed	Belgium	-2.90	23.92	6.55	19.84	78.93
Europe-Developed	Denmark	-2.66	13.03	5.24	15.87	40.61
Europe-Developed	Spain	-0.82	15.38	6.92	18.23	42.32
Europe-Developed	Finland	-3.59	10.53	3.56	15.55	31.71
Europe-Developed	France	-2.17	16.55	6.74	20.05	47.11
Europe-Developed	Ireland	-3.52	43.88	8.61	27.55	215.84
Europe-Developed	Italy	-2.79	15.31	5.04	16.10	54.04
Europe-Developed	Netherlands	-4.54	14.70	5.34	18.20	48.30
Europe-Developed	Norway	-5.11	28.57	9.65	31.87	83.03
Europe-Developed	Austria	-2.80	20.85	4.75	16.88	90.85
Europe-Developed	Sweden	-3.90	20.84	7.34	24.37	63.17
Europe-Developed	Switzerland	-4.57	8.23	2.86	11.57	31.84
Europe-Developed	UK	-4.37	35.44	7.10	25.88	132.62
Europe-Developed	*Region Average*	-3.66	24.92	6.14	21.30	116.80
Europe-Emerging	Greece	1.53	23.89	12.87	31.30	48.27
Europe-Emerging	Poland	2.23	40.54	16.22	38.58	133.82
Europe-Emerging	Portugal	-1.18	12.33	7.16	19.10	30.82
Europe-Emerging	Turkey	36.85	65.33	53.66	79.45	64.15
Europe-Emerging	*Region Average*	2.16	32.57	15.30	41.35	91.71
Middle East - Emerging	Israel	-0.63	14.92	9.18	21.02	34.16
Middle East - Emerging	*Region Average*	-0.63	14.92	9.18	21.02	34.16
North American	Canada	-4.92	31.90	7.07	28.57	110.86
North American	U.S.	-3.30	27.31	6.95	22.74	94.89
North American	*Region Average*	-3.51	28.59	6.95	23.46	106.35
South American -Emerging	Argentina	168.33	295.60	276.54	411.76	163.51
South American -Emerging	Brazil	-1.60	12.49	7.78	19.03	31.54
South American -Emerging	Chile	7.44	25.73	15.13	25.60	72.63
South American -Emerging	Mexico	8.32	20.04	17.49	29.43	24.23
South American -Emerging	Peru	10.74	33.87	23.96	43.87	48.53
South American -Emerging	*Region Average*	5.75	47.66	15.54	30.95	139.37
All		-2.86	23.34	6.14	20.39	145.02
All excluding U.S.		-2.74	21.55	5.99	19.73	143.82

This table provides the summary statistics for asset growth in each country. Asset growth in year t is computed as the percentage changes of total assets from fiscal year $t-2$ to fiscal year $t-1$. The reported statistics include 25^{th} percentile (P25), mean, median, 75^{th} percentile (P75), and standard deviation. Summary statistics for regional averages, all countries, all countries excluding U.S. are reported as well. All the reported numbers are the time-series averages of the respective test statistics over the sample years spanning from 1982 to 2006.

Table 3: Asset Growth Effect by Regions

REGION		SPREAD	STDSPREAD	AGSPREAD	COEFF
Africa - Emerging	Mean	-17.18	-14.27	8.48	-7.48
	(t-stat)	(-2.11)	(-1.46)	(2.24)	(-1.29)
Asia-Developed	Mean	0.36	3.98	1.75	0.65
	(t-stat)	(0.12)	(0.93)	(6.26)	(0.17)
Asia-Emerging	Mean	-10.89	-14.71	1.97	-11.86
	(t-stat)	(-2.35)	(-2.67)	(3.72)	(-3.67)
Australia - Developed	Mean	-2.79	-1.65	6.43	-3.05
	(t-stat)	(-0.58)	(-0.41)	(2.23)	(-0.63)
Europe-Developed	Mean	-6.31	-4.72	2.79	-3.42
	(t-stat)	(-2.47)	(-2.11)	(5.81)	(-1.82)
Europe-Emerging	Mean	3.11	2.20	1.82	-9.01
	(t-stat)	(0.51)	(0.36)	(7.21)	(-1.28)
Middle East - Emerging	Mean	9.42	9.38	1.10	7.83
	(t-stat)	(0.56)	(0.94)	(6.11)	(0.58)
North American	Mean	-13.49	-4.67	8.86	1.23
	(t-stat)	(-2.63)	(-2.21)	(3.04)	(0.46)
South American -Emerging	Mean	-3.09	-0.53	2.88	2.98
	(t-stat)	(-0.36)	(-0.06)	(4.38)	(0.45)
All Countries (Averaged)	Mean	-5.15	-4.38	2.90	-4.16
	(t-stat)	(-3.84)	(-3.16)	(6.60)	(-3.18)
All Countries Ex U.S. (Averaged)	Mean	-4.76	-4.28	2.79	-4.21
	(t-stat)	(-3.64)	(-2.97)	(6.64)	(-3.11)
All Countries (Pooled)	Mean	-6.00	-4.33	3.20	-4.47
	(t-stat)	(-4.57)	(-3.08)	(10.85)	(-3.63)
All Countries Ex U.S. (Pooled)	Mean	-5.40	-4.25	3.07	-4.59
	(t-stat)	(-4.08)	(-2.93)	(10.38)	(-3.61)

This table reports alternative measures of the asset growth effect: i) SPREAD, ii) STDSPREAD, iii) AGSPREAD, and iv) COEFF. To compute the first three measures, we sort stocks into deciles portfolios based on asset growth rates in year t, defined as the percentage changes of total assets from fiscal year $t-2$ to fiscal year $t-1$. Portfolios are held unchanged over the 1-year holding period from July of year t to June of year $t+1$. Stock returns are the 1-year buy-and-hold returns evaluated in local currencies. D10 portfolio contains stocks in the highest decile of asset growth rates and D1 portfolio contains stocks in the lowest decile of asset growth rates. SPREAD is the time-series averages of the difference in 1-year stock returns between D10 and D1 portfolios. STDSPREAD is the time series average of the stock return spreads between D10 and D1 portfolios scaled by the AG spreads of that market in the corresponding years. AGSPREAD is the time-series average of the differences between equal-weighted averaged asset growth rates of D10 stocks and those of D1 stocks. COEFF is the coefficient on asset growth when we regress 1-year buy-and-hold returns on asset growth. We pool together observations of all countries or a region to compute means of all countries and of a region. t-statistics are provided in the parentheses.

Table 4: Asset Growth Effect in International Markets: Different Holding Horizons

Panel A. All Countries Excluding US								
Return Horizon	1-Month	1-Month	1st-Year	1st-Year	2nd-Year	2nd-Year	3rd-Year	3rd-Year
Weighting	Equal	Value	Equal	Value	Equal	Value	Equal	Value
Intercept	**1.18**	**1.27**	**17.81**	**15.57**	**16.47**	**14.42**	**16.00**	**14.79**
	(4.18)	**(4.82)**	**(6.11)**	**(7.02)**	**(6.27)**	**(6.33)**	**(6.39)**	**(6.71)**
AG	**-0.34**	**-0.26**	**-3.66**	**-2.23**	-3.42	-1.73	-3.22	-3.87
	(-4.82)	**(-2.45)**	**(-2.77)**	**(-2.00)**	(-1.53)	(-0.58)	(-1.08)	(-1.11)
Adj.R2	16.26	21.69	19.48	23.40	20.01	23.76	20.76	24.11
Panel B. Developed Countries Excluding US								
Intercept	**1.18**	**1.28**	**17.80**	**15.63**	**16.46**	**14.49**	**16.00**	**14.87**
	(4.18)	**(4.85)**	**(6.09)**	**(7.08)**	**(6.28)**	**(6.39)**	**(6.41)**	**(6.73)**
AG	**-0.32**	**-0.27**	**-3.52**	**-2.52**	-3.25	-2.18	-3.26	-4.05
	(-4.15)	**(-2.27)**	**(-2.15)**	**(-1.83)**	(-1.37)	(-0.76)	(-1.07)	(-1.37)
Adj.R2	12.85	16.82	14.89	17.45	15.02	18.02	15.43	18.86
Panel C. Emerging Countries								
Intercept	1.05	**0.93**	**15.08**	**13.86**	**12.35**	**12.18**	**12.15**	**13.25**
	(1.53)	**(1.78)**	**(2.99)**	**(3.41)**	**(2.56)**	**(2.82)**	**(2.57)**	**(3.34)**
AG	**-0.33**	-0.21	-1.77	-0.65	0.18	2.68	-0.01	-3.01
	(-2.34)	(-1.02)	(-0.82)	(-0.31)	(0.09)	(1.11)	(0.00)	(-0.65)
Adj.R2	19.66	26.02	21.15	25.89	20.03	23.18	19.80	22.16

This table reports the results of cross-sectional regressions of stock returns of different holding horizons on asset growth. Holding periods are measured over the first month (1-month), the first year (1st-year), the second year (2nd-year), the third year (3rd-year) over the portfolio evaluation period of July of year t through July of year $t+1$. The regressions are estimated with equal-weights. Local currencies are used to compute stock returns. t-statistics are reported in the parentheses.

Table 5: Robustness of Asset Growth effect to size, B/M, and past returns

Return Horizon	1-Month	1-Month	1st-Year	1st-Year	2nd-Year	2nd-Year	3rd-Year	3rd-Year
Weighting	Equal	Value	Equal	Value	Equal	Value	Equal	Value
Intercept	**1.22**	1.11	**20.12**	**18.42**	**19.44**	**18.01**	**17.86**	**17.29**
	(4.19)	(3.09)	**(4.73)**	**(3.33)**	**(5.18)**	**(3.18)**	**(5.83)**	**(3.40)**
AG	**-0.30**	**-0.20**	**-2.99**	**-1.36**	-1.82	0.03	-2.21	-2.19
	(-4.93)	**(-1.96)**	**(-3.00)**	**(-2.12)**	(-1.03)	(0.01)	(-0.90)	(-0.81)
logMV	0.02	0.03	-0.30	-0.14	-0.26	-0.08	-0.07	0.05
	(0.51)	(0.89)	(-0.93)	(-0.26)	(-0.84)	(-0.15)	(-0.29)	(0.09)
logBM	**0.23**	**0.29**	**2.65**	**3.46**	**2.76**	**3.75**	**2.41**	**2.87**
	(5.35)	**(4.78)**	**(3.07)**	**(3.73)**	**(2.94)**	**(5.83)**	**(2.82)**	**(6.42)**
BHRET5	**0.96**	**0.88**	**6.66**	**6.15**	**-3.51**	**-4.87**	**-3.86**	**-6.88**
	(6.41)	**(4.11)**	**(3.93)**	**(3.23)**	**(-3.33)**	**(-3.32)**	**(-3.11)**	**(-4.87)**
Adj.R2	17.63	23.83	21.30	26.18	21.49	26.63	21.96	26.22

This table reports the result of cross sectional regressions of stock returns of different holding periods onto asset growth and control variables. The control variables include logMV, the natural logarithm of June-end market value (ME), logBM, the natural logarithm of the previous year's fiscal year-end book-to-market ratio (BM), and BHRET5 is the December-to-May returns prior to return prediction months. t-statistics are provided in the parentheses. Different holding horizons are used: 1-month, the first year, second year and third year after portfolio formation. Both equal-weights and value weights are used. t-statistics are reported in the parentheses.

Table 6: Effects of Asset Growth Components

Panel A: Asset Growth Components

Variable	Mean	Standard Deviation	25th Percentile	Median	75th Percentile
AG	14.84%	39.60%	-0.80%	6.77%	18.54%
ΔCash	2.51%	14.41%	-1.70%	0.36%	3.69%
ΔCurAsset	4.88%	15.66%	-1.22%	2.20%	7.55%
ΔPPE	4.80%	15.74%	-0.56%	1.49%	5.71%
ΔOthAsset	2.34%	12.28%	-0.53%	0.30%	2.36%
ΔRE	3.85%	17.77%	1.77%	4.22%	7.83%
ΔEquity	6.54%	26.90%	-0.39%	0.26%	4.69%
ΔDebt	3.54%	14.41%	-2.22%	0.77%	6.40%
ΔOpLiab	6.98%	14.72%	1.26%	4.62%	9.17%

Panel B: The Effect of Asset Growth Components

Return Horizon	1-Month	1-Month	1st-Year	1st-Year	1-Month	1-Month	1st-Year	1st-Year
Weighting	Equal	Value	Equal	Value	Equal	Value	Equal	Value
ΔCash	0.01	0.08	-1.12	0.68				
	(0.07)	(0.26)	(-0.65)	(0.30)				
ΔCurAsset	**-0.37**	**-0.60**	-1.78	-1.96				
	(-2.83)	**(-2.69)**	(-0.92)	(-0.81)				
ΔPPE	**-0.25**	-0.06	-3.44	-2.29				
	(-1.77)	(-0.31)	(-1.00)	(-1.46)				
ΔOthAsset	**-0.58**	0.05	-5.21	1.08				
	(-3.32)	(0.19)	(-1.63)	(0.37)				
ΔRE					0.15	-0.26	-3.55	-4.08
					(0.53)	(-0.54)	(-0.85)	(-0.81)
ΔEquity					**-0.68**	**-0.99**	**-4.53**	**-4.69**
					(-5.01)	**(-4.76)**	**(-2.45)**	**(-1.73)**
ΔDebt					**-0.66**	**-0.62**	**-5.34**	**-6.56**
					(-3.47)	**(-1.75)**	**(-3.29)**	**(-4.00)**
ΔOpLiab					**0.39**	**0.93**	**7.34**	**10.23**
					(1.86)	**(2.45)**	**(2.13)**	**(2.15)**
Adj. R2	17.71	24.21	21.47	26.66	19.09	27.70	23.50	30.68

This table reports the effects of various asset growth components. Panel A provides the statistics for asset growth and its various components. Values of mean, standard deviations, 25 percentile, median and 75th percentile are reported. Panel B reports the result of stock returns on various components of asset growth. ΔCash, ΔCurAsset, ΔPPE, and ΔOthAsset are the changes in cash and cash equivalents, current assets, PPE, other assets, and PPE plus depreciation from the fiscal year t-2 to fiscal year t-1, scaled by total assets in the fiscal year t-2. ΔOpliab, ΔDebt, ΔEquity, ΔRE are the changes in operating liabilities, long-term debt, equity financing, and retained earnings from the fiscal year t-2 to fiscal year t-1, scaled by total assets in the fiscal year t-2. 1-month and 1-year holding period returns are used. Both equal-and value-weights are used. t-statistics are provided in the parentheses.

Table 7: Cross-sectional analysis on capital market efficiency measures

	SPREAD					STDSPREAD					COEFF				
R2	0.10**			0.11**	0.10**	0.07			0.09*	0.07*	0.02			0.03	0.01
	(2.27)			(2.39)	(2.42)	(1.57)			(1.82)	(1.75)	(0.47)			(0.82)	(0.23)
BANK		0.06*		0.08**			0.09**		0.10***			0.06*		0.06*	
		(1.92)		(2.39)			(2.58)		(2.91)			(1.85)		(1.95)	
MKT		-0.07**		-0.07**			-0.08**		-0.08**			-0.02		-0.02	
		(-2.03)		(-2.21)			(-2.48)		(-2.64)			(-0.82)		(-0.87)	
MKT/BANK			-0.31**		-0.32**			-0.41***		-0.41***			-0.10		-0.10
			(-2.54)		(-2.60)			(-3.12)		(-3.17)			(-0.89)		(-0.87)
Intercept	0.10*	-0.05	0.23**	0.07	0.40***	0.09	-0.09	0.35***	0.01	0.47***	-0.01	-0.21*	0.05	-0.17*	0.07
	(1.73)	(-0.47)	(2.08)	(0.64)	(3.56)	(1.27)	(-0.64)	(2.89)	(0.05)	(4.14)	(-0.11)	(-1.98)	(0.47)	(-1.77)	(0.51)

This table reports the results of OLS estimation results of cross–sectional regressions of the time-series average from 1990 to 2006 of return spread (SPREAD), standardized return spread (STDSPREAD), and return predictive regression coefficient of asset growth (COEFF) on various country capital market efficiency measures: logistic transformation of time-series average of R2 (R2), time-series average of logarithm of credit volume to private sector to GDP ratio (BANK), time-series average of logarithm of market capitalization to GDP ratio (MKT), and the relative importance between MKT and BANK (BMT/BANK). Jackknife standard errors are used and significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 8: Cross-sectional analysis on cash flow beta, discount rate beta, and ΔGDP

	SPREAD				STDSPREAD				COEFF			
β_{cf}	-0.04			0.08	-0.05			0.14	0.01			0.17***
	(-1.37)			(1.40)	(-1.47)			(1.54)	(0.23)			(3.07)
β_r		-0.09*		-0.22**		-0.13**		-0.33*		-0.02		-0.26***
		(-1.72)		(-2.31)		(-2.41)		(-1.93)		(-0.33)		(-4.62)
ΔGDP			0.01				0.01				-0.01	
			(1.15)				(0.46)				(-0.60)	
R2				0.15***				0.15***				0.08*
				(3.84)				(3.39)				(1.94)
BANK				0.10***				0.13***				0.12***
				(3.07)				(3.36)				(4.42)
MKT				-0.07**				-0.08***				-0.03
				(-2.60)				(-2.82)				(-1.39)
Intercept	-0.04*	-0.02	-0.08***	0.09	-0.01	0.02	-0.04	0.02	-0.04**	-0.03	-0.03	-0.28***
	(-1.96)	(-0.92)	(-2.32)	(0.89)	(-0.27)	(0.78)	(-1.04)	(0.13)	(-2.57)	(-1.20)	(-0.82)	(-3.65)

This table reports the results of OLS estimation results of cross–sectional regressions of the time-series average from 1990 to 2006 of return spread (SPREAD), standardized return spread (STDSPREAD), and return predictive regression coefficient of asset growth (COEFF) on country cash flow beta, discount rate beta and ΔGDP. Control variables include logistic transformation of time-series average of R2 (R2), time-series average of logarithm of credit volume to private sector to GDP ratio (BANK), time-series average of logarithm of market capitalization to GDP ratio (MKT). Jackknife standard errors are used and significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 9: Cross-sectional analysis on corporate governance/legal/accounting standards

Panel A: SPREAD

	VOICE	STABILITY	EFFECTIVE	QUALITY	LAW	CORRUPT	UK	FR	GE	SC	ACCOUNTING
RHS	-0.000	0.001	0.001	0.001	0.000	0.000	-0.048	0.015	0.043	-0.008	0.000
	(-0.16)	(0.87)	(0.69)	(0.87)	(0.53)	(0.62)	(-1.15)	(0.42)	(1.08)	(-0.21)	(0.13)
Intercept	-0.040	-0.083*	-0.101	-0.110	-0.082	-0.083	-0.034*	-0.054**	-0.058***	-0.048**	-0.081
	(-0.71)	(-1.73)	(-1.25)	(-1.48)	(-1.18)	(-1.36)	(-1.83)	(-2.42)	(-2.91)	(-2.57)	(-0.60)

Panel B: STDSPREAD

	VOICE	STABILITY	EFFECTIVE	QUALITY	LAW	CORRUPT	UK	FR	GE	SC	ACCOUNTING
RHS	-0.000	0.001	0.001	0.001	0.001	0.001	-0.068*	0.024	0.056	-0.011	0.001
	(-0.04)	(0.92)	(0.53)	(0.70)	(0.50)	(0.75)	(-1.83)	(0.63)	(1.35)	(-0.17)	(0.73)
Intercept	-0.018	-0.062	-0.079	-0.096	-0.058	-0.076	0.000	-0.030	-0.033	-0.020	-0.123
	(-0.24)	(-1.10)	(-0.64)	(-0.80)	(-0.67)	(-0.89)	(0.00)	(-1.38)	(-1.60)	(-1.03)	(-1.00)

Panel C: COEFF

	VOICE	STABILITY	EFFECTIVE	QUALITY	LAW	CORRUPT	UK	FR	GE	SC	ACCOUNTING
RHS	0.000	0.001	0.002*	0.002**	0.001	0.001	-0.034	-0.007	0.054	-0.003	0.002**
	(0.65)	(1.02)	(2.01)	(2.13)	(0.96)	(1.46)	(-1.01)	(-0.22)	(1.55)	(-0.06)	(2.54)
Intercept	-0.072	-0.081	-0.172**	-0.171**	-0.102	-0.124*	-0.027	-0.034*	-0.049***	-0.037**	-0.157***
	(-1.14)	(-1.54)	(-2.31)	(-2.46)	(-1.32)	(-1.81)	(-1.57)	(-1.76)	(-2.94)	(-2.36)	(-3.20)

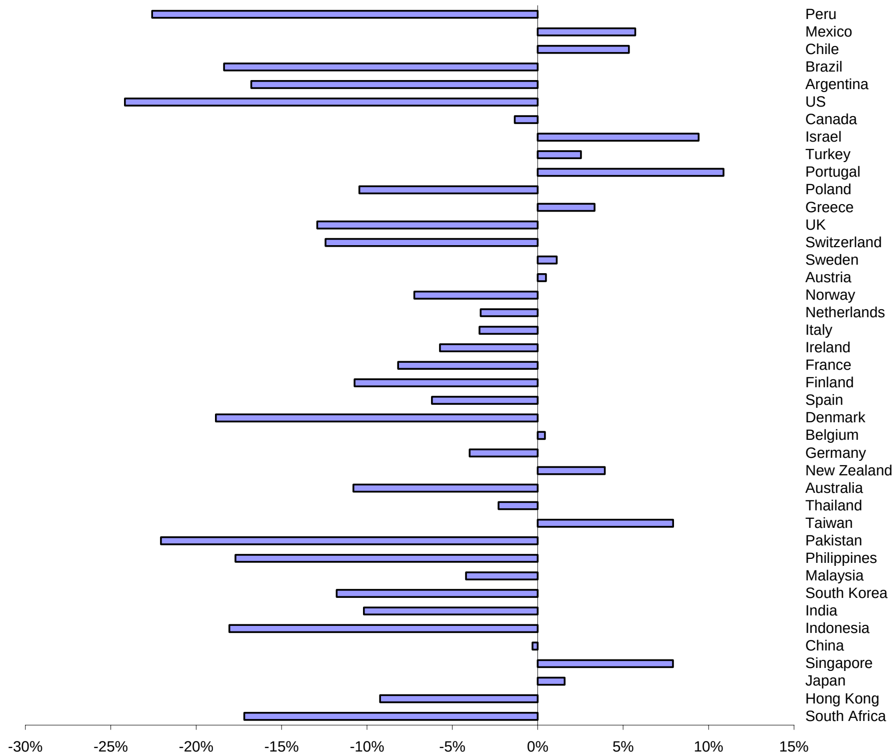
This table reports the results of OLS estimation results of cross-sectional regressions in 47 countries on various country corporate governance, legal and accounting standard measures. These measures are described as in Appendix B. In Panel A the dependent variable is the time-series average from 1990 to 2006 of return spread (SPREAD). Panel B the dependent variable is the standardized return spread (STDSPREAD). Panel C the dependent variable is the return predictive regression coefficient of asset growth (COEFF). In Panel D capital market efficiency measures are added in regressions of COEFF on EFFECTIVE, QUALITY and ACCOUNTING as control variables. Jackknife standard errors are used and significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 10: Cross-sectional analysis on costly arbitrage

	SPREAD			STDSPREAD			COEFF		
	IVOL	TURNOVER	SHORTSALE	IVOL	TURNOVER	SHORTSALE	IVOL	TURNOVER	SHORTSALE
RHS	-0.784	-0.000	-0.001	-0.653	-0.000	-0.001	-0.340	-0.000	-0.002
	(-1.47)	(-0.04)	(-0.22)	(-1.65)	(-0.05)	(-0.25)	(-1.04)	(-0.11)	(-1.04)
Intercept	0.025	-0.067*	-0.055*	0.037	-0.045	-0.032	-0.005	-0.043	-0.026
	(0.48)	(-1.85)	(-1.85)	(0.90)	(-1.14)	(-0.81)	(-0.15)	(-1.31)	(-1.33)

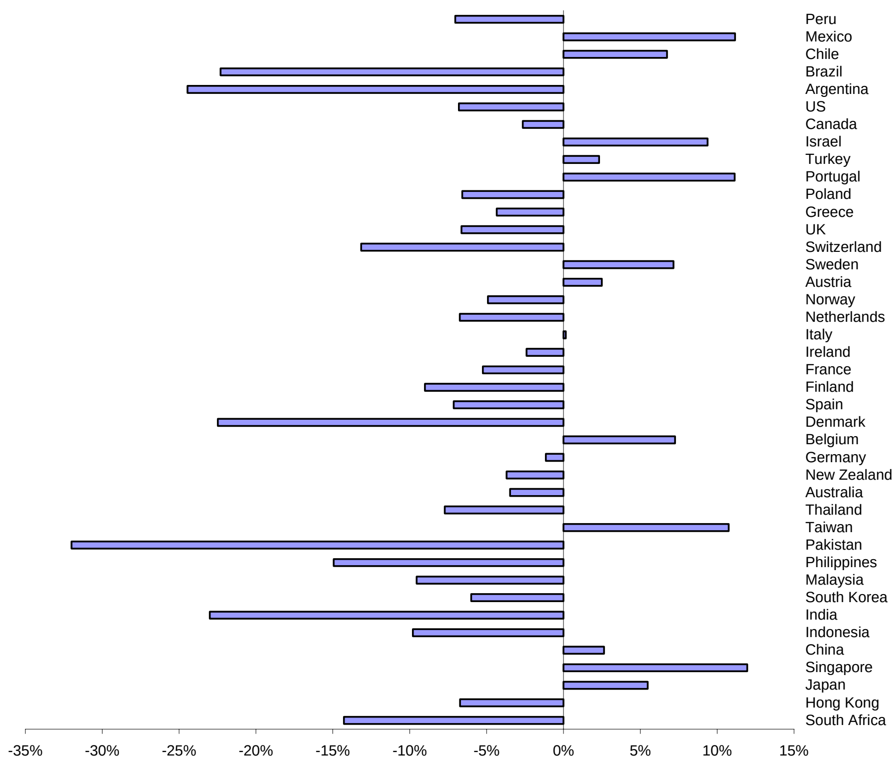
This table reports the results of OLS estimation results of cross–sectional regressions of the time-series average from 1990 to 2006 of return spread (SPREAD), standardized return spread (STDSPREAD), and return predictive regression coefficient of asset growth (COEFF) on various country measure of arbitrage costs. These measures are described as in Appendix B. Jackknife standard errors are used and significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Figure 1: Return Spreads



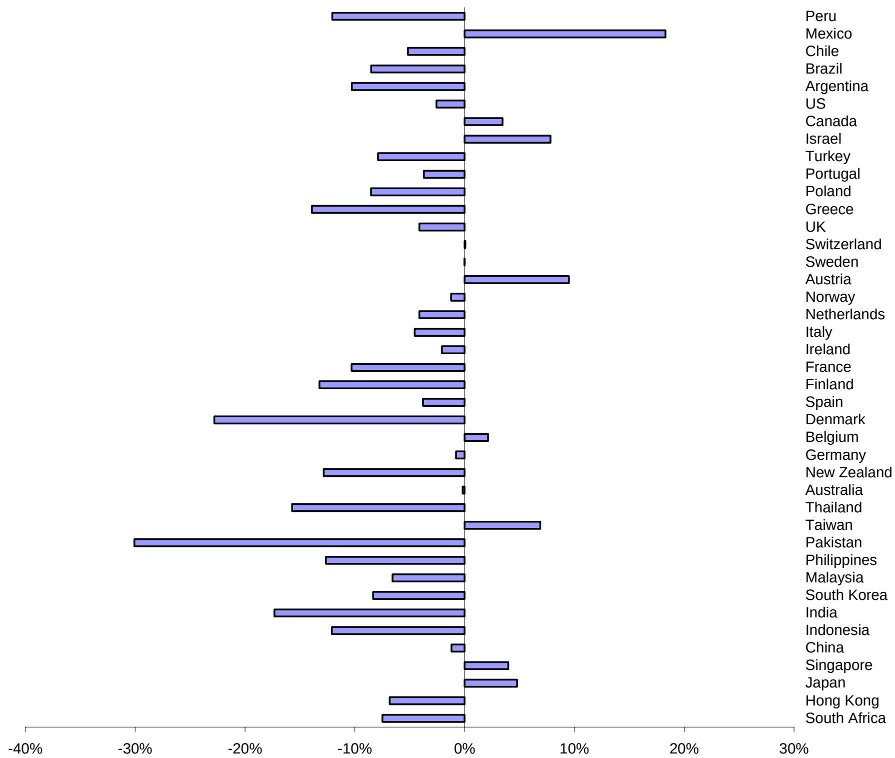
This figure plots return spreads between D10 and D1 portfolios of 40 international markets and U.S. We sort stocks into deciles portfolios based on asset growth rates in year t, defined as the percentage changes of total assets from fiscal year $t-2$ to fiscal year $t-1$. Portfolios are held unchanged over the 1-year holding period from July of year t to June of year $t+1$. Stock returns are the 1-year buy-and-hold returns evaluated in local currencies. D10 portfolio contains stocks in the highest decile of asset growth and D1 portfolio contains stocks in the lowest decile of asset growth. Reported return spreads are the time series average of the stock return spreads between D10 and D1 portfolios. Our sample period is from 1982 to 2006.

Figure 2: Standardized Return Spreads



This figure plots standardized return spreads of 40 international markets and U.S. We sort stocks into deciles portfolios based on asset growth rates in year t, defined as the percentage changes of total assets from fiscal year $t-2$ to fiscal year $t-1$. Portfolios are held unchanged over the 1-year holding period from July of year t to June of year $t+1$. Stock returns are the 1-year buy-and-hold returns evaluated in local currencies. D10 portfolio contains stocks in the highest decile of asset growth rates and D1 portfolio contains stocks in the lowest decile of asset growth rates. Standardized return spread is the time-series averages of the difference in 1-year stock returns between D10 and D1 portfolios scaled by AG spreads. Our sample period is from 1982 to 2006.

Figure 3: Asset Growth Coefficient



This figure plots asset growth coefficients from cross-sectional regressions of 1-year buy-and-hold returns on asset growth. Reported asset growth coefficients are the time series average of the asset growth coefficients for all the countries. Our sample period is from 1982 to 2006.