THE INFLUENCE OF INSTITUTIONS, INVESTOR PROTECTION AND CORPORATE BLOCK-SHAREHOLDERS IN ASSET PRICING

1. INTRODUCTION

The Capital Asset Pricing model (CAPM) of Sharpe (1964), Lintner (1965) and Black (1972) and it's central prediction that utility maximising investors are able to invest in integrated asset markets with expected returns on invested portfolios being a linear function of their slopes against the mean-variance efficient market portfolio has had a largely central position in the asset pricing literature since inception. More recently however Fama and French (1993) have found evidence that differences in firm size and accounting book value-to-market value should be treated as additional state variables while more recently still evidence from Pastor and Stambaugh (2003), Amihud (2002) and Liu (2006) points to the role of liquidity in being such a state variable. However the role of institutions and their association with levels of concentrated ownership and the impact of these on outsider investor welfare in terms of protection against costs arising from monitoring insiders and agency (Jensen and Meckling, 1976) is a relatively unexplored area in the asset pricing literature. Consequently our first contribution to the literature is in the construction of an asset pricing model that takes account of the changes in outside minority investor welfare from both differences in institutional quality and degree of ownership concentration in the hands of insider groups.

There is now considerable evidence against the diversified ownership model of the firm originally envisaged by Berle and Means (1932) with evidence from Demsetz and Lehn (1985), Shleifer and Vishny (1986) as well as Morck, Shleifer and Vishny (1988) revealing at least modest concentration of ownership in large US corporations. Similar concentration is found across other developed countries such as Germany (Edwards and Fischer, 1994), Japan (Prowse, 1992) and Italy (Barca, 1995). However it is even more pronounced in developing countries (La Porta et al, 1998) with family-centred domination being particularly significant across much of East Asia (Claessens et al, 2000) as well as North Africa and Middle East (Hearn, 2011). Notably in all cases ownership concentration is greater within countries that have weaker levels of institutional and legal protection of outside minority investors (La Porta, Lopez-de-Silanes, Shleifer and Vishny, henceforth LLSV, 2000). In this context outside minority investors are more vulnerable to expropriation by insider groups seeking private benefits of control and as such more dependent on the relative strength of protection of property rights afforded both by law as well as its effective enforcement (LLSV, 2000). As such institutions and their relative

level of development underscore cross-country differences in the alignment of interests between outsider owners (principals) and insider controlling owner-manager groups (agents). In particular they largely underpin the level of concentration of ownership by insiders (La Porta et al, 1999) as well as their ability to exercise private benefits of control (LLSV, 2000).

Jensen and Meckling (1976) view the firm as a nexus of contracts, where insider's utility is derived from both pecuniary and non-pecuniary benefits which is at odds with the utility of the outside investor whose central focus is on return on investment. Furthermore they view legal institutions as a means of making the extraction of preferential economic rents by insiders progressively harder and more costly with increasing levels of ownership diversification in the firm. LLSV (2000) build on this view with a wider definition of institutions protecting minority outsider investor property rights to information so as to make accurate decisions, through regulatory disclosure and accounting rules, as well as legal rules ensuring their ability to receive dividends on pro-rata terms, to vote for directors and participate in shareholder meetings, to subscribe to new issues on same terms as insiders, to sue directors or majority for suspected expropriation and to call annual and extraordinary general meetings etc (LLSV, 2000). There is a considerable literature relating the legal origin to the relative content of law and legal rules (see LLSV (2000); La Porta et al (2002, 2008) for an overview) which underlines the importance of the comparatively few European legal families from which most of the national legal codes across the world are derived, namely English common law on one hand and French, German and Scandinavian civil code on other. However while there are rival judicial and political explanations behind the differences in legal philosophy and organization of these legal systems (LLSV (2000); La Porta et al (2008)) there are other wider differences in development and evolution of the legal system (Joireman (2001, 2005)) and deeper differences in the development of broader legal, governmental and political institutions (North (1994); Beck et al (2003)). Judicial explanations of differences between legal traditions largely centre on the structure of the legal process by which law and rules are formed. Countries with systems derived from English common law have independent judiciaries with law being formed through a competitive process of competing case arguments and through precedent set by a centrally appointed judge. In terms of expropriation commercially trained judges alongside jury's hear competing arguments from both parties to a contractual claim and form precedent on basis of notions of fairness to outsider investors (Coffee (2000); Johnson et al (2000)). In direct contrast laws are created in civil code systems by legislatures and judges are largely relegated to a lesser role in administering the legal rules passed down rather than assessing law by precedent on a case-by-case basis. Consequently

LLSV (2000) argue that the "bright line rules" of civil code systems infers vague fiduciary duty principles that are more susceptible to being circumvented by experienced insiders.

Joireman (2001, 2005) however finds evidence of a contrasting legal evolutionary perspective which is particularly prevalent in developing economies where it is insufficient to narrow the scope of focus in merely contrasting civil code against common law while these are different in structure and content. The rudimentary basis the legal, governmental and political structures were inherited from the former colonial metropole underscores the often underdeveloped and incomplete nature of the system and its inability to offer effective protection of property rights (Joireman, 2001). This is particularly true in former colonies with economies based on extractive industries, as opposed to more broadly based "settler" economies, where political, governmental and legal institutions were bequeathed by the former colonial metropole in order to support the strategic use of the colony and industry (North, 1994). As such many countries at independence inherited rudimentary governance institutions with untrained judiciaries in common law countries (Joireman, 2001) and incomplete legislative bureaucracies necessary to support legal code formation in civil code countries (Joireman, 2001). Legal origins theory in particular traces the origins of the four principle legal families back to their historical evolution and development (LLSV (2000); La Porta et al (2008)). In particular commercial codes were adopted by Napoleon and Bismarck who were formative in centralising the role of the state in corporate ownership and resisted the relinquishment of this control to financiers. These systems promoted the centralised control of the state over the law making process and inhibited state devolving control over commercial and economic decisions to more distant courts (LLSV, 2000). Contrastingly the formation of parliament in England and cessation of centralised legal powers of the king to landowners who primarily made up parliament was pivotal in the formation of nascent concepts of protection of private property rights over and above state expropriation (LLSV, 2000). However evidence from both La Porta et al (1999) and LLSV (2000) reveals that the discretion and fairness assessment by judges which is prevalent in common law countries together with the competitive nature of law formation by precedent nurtures legal innovation from within the system in contrast to the imposition of codified statutes by a remote centralised legislature (LLSV (2000); Levine (2005); La Porta et al (2008)). This leads to our second contribution to the literature which is the introduction of a new valuation measure capturing the welfare implications on outside investors from ownership concentration which itself is influenced by a range of wider institutional development attributes and the application of this to a sample of sixty eight equity markets worldwide. These measures, namely democratic voice and accountability, effective government, control of corruption, political

stability and absence from conflict, regulatory quality and finally rule of law, were developed retrospectively by Kaufman et al (2009) through the World Bank. Notably they capture a broader range of institutional characteristics, including governmental, political, legal and regulatory, marking a considerable extension from the sole focus on distinctions between legal regimes which is common to the literature.

The implications for capital structure owing to prevailing national institutions are quite considerable across countries with differences in national accounting and reporting techniques as well as an emphasis on internal finance in countries with poor levels of property rights protection and less reliance on external equity finance in relation to bank-based relationship finance (Levine, 2005). This has significant implications for common valuation variables such as the ratio of book equity value to market value, or book to market ratio, and market capitalization, which is itself contingent on relative amounts of equity externally listed and itself varies considerably between legal regimes. Evidence of a positive relationship between a strong legal framework for investor protection and high firm valuation relative to their book value is provided in Claessens et al (2002). Equally, the quality of a country's legal and regulatory enforcement institutions and the protection of property rights and minority investors from expropriation is a critical determinant in the level of transactions costs and liquidity between stock markets (La Porta et al (2008); Lesmond (2005)). Thus, national institutions are considered a determinant of liquidity, ownership and governance, all of which are important when compared international markets. As a consequence while the strict relationship between stock market liquidity and legal and political institutions has been previously explored by Lesmond (2005) we extend this analysis by widening the study to include both developed and emerging markets. Therefore we use aggregated investor protection indices to take account of a number of individual institutional characteristics such as control of corruption, political stability, regulatory quality and rule of law as introduced by Kaufman et al (2009). These provide a measure of institutional quality across markets in both emerging and developed countries and are superior to the use of a single measure as in the case of Lesmond (2005) within emerging markets. Furthermore, to take account of differences in ownership structure, and in particular ownership dispersion, which is a response to the protection of property rights we introduce a new investor protection measure. This allows a ranking of individual firms' stocks according to institutional quality in their primary markets with respect to the level of dispersed ownership rather than that associated with dominant corporate block-shareholders and measured as percentage free float to market capitalization. This supports the impact of investor protection on ownership dispersion found in La Porta et al (1999) and Boulton et al (2009), who found

substantial evidence from an international sample of differences in levels of block ownership and firm governance mechanisms between countries with common and civil law legal systems, where the latter is typically dominated by block shareholders and low free float capitalization.

Our final contribution to the literature is through the incorporation of our new investor protection measure in a formal asset pricing framework and assessing the implications to welfare of a US minority outside investor engaging in international portfolio investment. This builds on the dynamic stochastic general equilibrium asset pricing models recently proposed by Albuquerue and Wang (2008) and Dow et al (2005) that include measures of shareholder and investor protection for the first time. Standard asset pricing theory dictates that the cross-section of expected stock returns are related to return sensitivities to state variables linked to investors overall welfare (Pastor and Stambaugh, 2003). Assets whose lowest returns accompany unfavourable shifts in welfare must compensate investors for the loss of value associated with holding the asset. While Fama and French (1993) proposed that variations in size as well as accounting book to market value of stocks constitute state variables there is considerable evidence in the literature of liquidity also being included (Acharya and Pedersen (2005); Pastor and Stambaugh (2003); Liu (2006); Lee (2010)). However, given the role of national institutions in defining liquidity and reducing transactions costs, particularly the difference between common law and civil code markets we ask whether variations in cross sectional expected returns can be better explained by investor protection rather than simply liquidity, or the Fama and French factors of size and book-to-market value. We use the time series regression approach of Black, Jensen and Scholes (1972) in preference to the Fama and Macbeth (1973) cross sectional regression technique employed in Fama and French (1992). The use of time series regressions facilitates the convenient study of two main issues in asset pricing. The first centres on the rational pricing of assets where variables that are related to average returns such as size, book-to-market value, liquidity or investor protection, must proxy for sensitivity to common (shared and thus un-diversifiable) risk factors in returns (Fama and French, 1993). The second concerns a well specified asset pricing model that uses excess returns where intercepts should be indistinguishable from zero (Merton, 1973). Fama and French (1993) find that comparison of the estimated intercepts gives rise to a simple return metric and formal test to differentiate between the different combinations of common factors in their ability to capture the cross section of average stock returns.

We find evidence that increases in investor protection, defined as decreasing firm ownership concentration and increasingly developed institutions, is generally positively related to book-to-market value and weakly negatively related to illiquidity. The book-to-market value

having been used by Fama and French (1992, 1993), with liquidity defined as the multi-dimensional measure of Liu (2006). This would infer that as investor protection improves, many smaller firms with greater uncertainty over future earnings prospects on stock markets, accounting for increases in aggregate book-to-market value while the improvement in investor protection facilitates greater involvement of minority investors and consequently more trading activity and more liquidity.

Furthermore we find evidence that stock dispersion across deciles portfolios are ranked as a function of the strength of investor protection and are largely in support of La Porta et al (1997, 2008) where stocks from common law, and in particular, developed markets, progressively dominate the portfolios where there is improved investor protection while civil code law and especially emerging country stocks fall into those portfolios defined by weaker investor protection. We find evidence that a two-factor time series capital asset pricing model (CAPM) augmented with the new investor protection valuation factor improves explanatory power in terms of constants being indistinguishable from zero than either the two-factor liquidity CAPM proposed by Liu (2006) or the three-factor size and book-to-market augmented CAPM proposed by Fama and French (1993). However, there are discernable differences between markets. The expected returns to increased investor protection are positive in markets with already high levels of institutional quality and dispersed ownership, implying further improvements will be met with positive rewards. But, the opposite is true in markets with low levels of existing protection where further increases in protection and dispersion of ownership are likely to be met with negative premiums. We conjecture that this result reflects an array of very different governance mechanisms associated with large block-shareholder groups and minimal ownership dispersion in markets with poor protection while those with existing high protection are more likely to have governance mechanisms based on the power of the market, which rewards increased ownership dispersion.

The paper is structured as follows. Section 2 introduces the liquidity measure and its construction as well as the new investor protection measure. Section 3 investigates the relationship between liquidity and the political, legal and institutional governance measures at firm level. Section 4 briefly reviews the CAPM methodology. Section 5 presents the results of the estimate to compare the various liquidity measures followed by the extended valuation model. The final section concludes.

2. MARKET INSTITUTIONS AND LIQUIDITY MEASUREMENT

This section discussed the construction of measures used to capture liquidity effects. All measures were applied to all stocks across the sample of international markets, each using the constituents of the top tier blue chip indices as these are most likely to be considered for inclusion in risk diversification portfolios of international investment managers. These are also the most likely candidate stocks to conform with the assumption of international asset market integration, which is critical to CAPM valuation models.

2.1 Liquidity constructs

Liu (2006) measure

Daily price and volume data are from Datastream. The measure is derived from the recent work of Liu (2006) and is defined as LM_x which is the standardized turnover-adjusted number of zero daily trading volumes over the prior x months (x = 1, 6, 12) i.e.

$$LM_x = \left[\left(\text{Number of zero daily volumes in prior x months} \right) + \frac{1/\text{x month turnover}}{\text{Deflator}} \right] * \frac{21x}{NoTD} \qquad (1)$$

where x month turnover is the turnover over the prior x months, calculated as the sum of the daily turnover over the prior x months, daily turnover is the ratio of the number of shares traded on a day to the number of shares outstanding at the end of the day, NoTD is the total number of trading days in the market over the prior x months, which in this case is 1, and Deflator is chosen such that,

$$0 < \frac{1/\left(x \text{ month turnover} \right)}{Deflator} < 1 \qquad (2)$$

for all sample stocks[1]. Given the turnover adjustment (the second term in brackets in first expression), two stocks with the same integer number of zero daily trading volumes can be distinguished: the one with the larger turnover is more liquid. As such the turnover adjustment acts as a tie-breaker when sorting stocks based on the number of zero daily trading volumes over the prior x months. Because the number of trading days can vary from 15 to 23, multiplication by the factor (21x/ NoTD) standardizes the number of trading days in a month to 21 which makes the liquidity measure comparable over time. LM1 can be interpreted as the turnover-adjusted number of zero daily trading volumes over the prior 21 trading days, which is the

[1] In line with Liu (2006) a deflator of 1,000 is used in constructing estimates for LM1

approximate average number of trading days in a month. The liquidity measure, LM_x is calculated at the end of each month for each individual stock based on daily data. Daily data is available for all markets across entire sample period. This measure is used in preference to other liquidity measures such as the Amihud (2002) price-impact construct, zero returns measure of Harvey et al (2006) or ubiquitous turnover measure owing to its ability to capture liquidity as a multi-dimensional phenomenon (Liu, 2006).

2.2 Investor Protection Measure

The aggregate investor protection measure is constructed using a three stage procedure. The first stage draws on the World Bank governance indicators of voice and accountability, which captures 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; political stability and no violence, which captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism; government effectiveness, which captures 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; regulatory quality, which captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; rule of law, which captures 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; and control of corruption, which captures 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. The rule of law encompasses the dimensions of the La Porta et al (1998, 2008) indicator, as well as the legal enforcement of Bhattacharya and Daouk (2002).

The indicators are compiled from the responses on the quality of governance given by a large number of enterprises, citizens and expert survey respondents in industrial and emerging countries, reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations (Kaufman et al, 2009). The six indicators are constructed using an unobserved components methodology, detailed in Kaufman et al (2009) with raw values ranging from approximately -2.5 to +2.5 where higher values relate to better

governance outcomes. Each indicator is recalculated and updated on a regular basis of approximately every two years since they were first introduced in 1999[2].

The second stage rescales each governance indicator to fit on a scale of between 0 and 10 using equation (6):

$$\left(\frac{x_{jt} - X_{Min}}{X_{Min} - X_{Max}} \right) * 10 \qquad (3)$$

where j indicates the measure's value for country j at time or year t. The rescaling of the indicators facilitates their aggregation into a single aggregated governance indicator. This is achieved through the simple addition of each of the six individual governance indicators.

In the final stage the aggregate governance measure for each country which holds across all months in each respective year is multiplied by the mean monthly proportion of free float shares for each individual listed firm, defined as the proportion of total issued shares available but not held by existing incumbent block-shareholders expressed as a percentage.[3] This is in the spirit of Jensen and Meckling (1976) where the extraction of private benefits of control by an incumbent owner-founder shareholder is facilitated through high block-shareholding and consequential low free float capitalization proportions in the presence of weaker institutional and legal property rights protection. As such levels of free float capitalization can be viewed as inverse representations of levels of block-shareholding in firms and stocks. This allows the generation of a variable that relates individual firm characteristics to the institutional quality of the primary market.

$$Investor\,\Pr otection_{ijt} = \widehat{Aggregate\,Governance}_{jt} * \widehat{Free\,Float}_{ijt} \qquad (4)$$

where j represents country, t indicates the year, and i represents the individual firm i which is listed in country j. The use of individual stock free float percentages also acts as a tie-breaker in being able to separate and distinguish between stocks in countries with similar levels of institutional quality. The multiplication of the annual periodicity aggregated institutional quality

[2] Governance indicators are available on The World Bank website at: http://info.worldbank.org/governance/wgi/index.asp

[3] Data for the free float were taken from Datastream which directly sources the information from individual stock exchanges.

index with monthly periodicity proportions of free float capitalization is justified on the basis that institutional change that does occur is often slow to enact (Williamson, 2000). As such this rules out taking the errors or innovations of a first or second order autocorrelation process as is commonly the case in liquidity measures.

3. DATA AND LIQUIDITY MEASURES

Sixty five equity markets are included in the sample, reflecting a mix of developed and emerging countries. We divided the countries into developed and emerging markets according to the Dow Jones classification. These were selected according to their size relative to other smaller regional markets and subject to data availability. The sample period used was from January 2000 to 2010.

3.1 Data: Sources

Daily stock closing, total number of shares outstanding, traded volumes, and dividend per share in local currency for all markets are from Datastream. The value data were all converted into US$, and US Treasury yield data were collected to represent the risk free rate. Both variables were also from Datastream. These data were used to calculate the daily return variance (volatility), market capitalization (defined as total number of shares outstanding multiplied by daily closing price), and the various liquidity constructs. The five year US Treasury Bill yield rate was adjusted to take account of monthly excess returns as opposed to the quoted equivalent annualised rates. The conversion of the total returns series and prices into US$ and the use of US Treasury Bill yield assumes long term parity between the local currency and US$ and is justified on the basis of significant volatility in inflation rates across many emerging markets. It is assumes the position of a US investor in calculations which is justified on basis on the US forming the majority of emerging markets portfolio investment.

3.2 Summary statistics: liquidity and institutional quality

The descriptive statistics for the constituent stocks are in Table 1. The most striking difference is between developed and emerging markets with the former having much less price-rigidity (lower percentage daily zero returns), lower bid-ask spreads, and larger market capitalizations. This is shown by the markets in the Developed Europe group, which have percentage daily zero returns values between 10 and 20%, apart from Ireland and Iceland, compared to those in the Emerging Europe group where these values are much higher, such as 56.58% (Czech Republic) and 84.50% (Latvia). Similarly, the emerging markets in Africa are characterised by extreme

illiquidity (Hearn and Piesse, 2009) while those in Latin America are also characterized by very high daily percentage zero returns. The recently established markets in the Middle East also have very high illiquidity with the extremes being Israel and Saudi Arabia where liquidity is considerably higher than the rest of the region. There is also considerable variation in all six institutional quality indices across the sample with these notably being consistently higher in Western Europe and North America and in particular in Scandinavian markets. In contrast Russia and China alongside several Latin American and African countries have the lowest scores across the six institutional quality indices. There is also variation across the sample in proportion of free float capitalization although generally this is lower in French and German origin civil code countries than in either English common law or Scandinavian civil code markets. Furthermore French civil code markets consistently score least well in relation to German civil code or English common law markets. However, Scandinavian civil code law countries dominate all the investor protection and governance rankings. This may well be a reflection that the governance indicators themselves do not capture every aspect of the phenomena they are designed to measure which may induce an element of bias towards Scandinavian countries (Horst, 2006). This provides some support for the findings in La Porta et al (1997, 2008).

Table 1

4. EMPIRICAL METHODOLOGY

This section details the expected relationship between investor protection and Stoll (2000) market control variables plus book-to-market value and liquidity. It then provides an overview of portfolio and return-based factor construction is provided before examining the CAPM pricing model and its variants.

4.1 Relationship between investor protection, firm value and liquidity

The external legal, political, regulatory and governmental institutional framework is a critical determinant in the protection of property rights of minority shareholders (LLSV, 2002). While there is more recent evidence of considerable ownership concentration worldwide (LLSV (2000, 2002); La Porta et al (2008)) to the contrary of that envisaged in Berle and Means (1932) model of the US market, this is particularly prevalent in countries with weaker institutional development (LLSV, 2002). As such higher levels of institutional development and quality are associated with more widely held firms and attract a higher price from outsider minority

investors who are willing to pay more (a higher price) for the recognition that improved protection will make expropriation more costly for insiders and thus facilitate higher returns on their investment from dividends and interest (LLSV, 2002). There is wider recognition for the role of price with Stoll (2000) using natural logarithm of price as a proxy of discreteness where low price stocks are more risky than those of high price. Much of Stoll's intuition concerns broker's order processing and inventory considerations where increases in traded volume, number of trades and firm size are all associated with greater likelihood of finding a trading counterparty which in turn reduces the risk associated with accepting inventory. Stock volatility or variance measures the risk of adverse price changes for stocks placed in broker's inventory. However while Stoll focuses on the role of these variables in explaining the price of trading immediacy, itself represented by the spread between bid and ask prices for stocks, we are concerned in the relationship between these trading and inventory variables and investor protection, in turn represented by our new measure that captures changes in ownership concentration and institutional development. We further extend this study to look at the relationship between investor protection and both liquidity, represented by the multi-dimensional construct of Liu (2006), and the accounting book equity value to listed market value of stocks, a variable first used in pricing in Fama and French (1992, 1993). Fama and French (1992) find that smaller firms with low levels of market equity are more likely to have poorer prospects than firms with contrastingly large listed market capitalization. Large stocks are deemed to be more likely to firms with stronger prospects, lower book-to-market value and lower average returns (Fama and French, 1992). However the Fama and French study focuses on the US market. The extension of this within an international context merits the inclusion of the effects of institutional development and its effect on levels of equity issuance. LLSV (2002) find evidence of substantial differences in offerings and listing size between markets with different underlying legal origins as the level of property rights inferred by legal, regulatory and political regime strongly influences firm's ability to access external finance and the development of financial markets.

4.2 Valuation Factor construction

All valuation factors are formed from zero cost portfolios constructed to mimic underlying state variables across the entire cross section of average stock returns from across the entire sample of constituent stocks themselves from blue chip indices of sixty five worldwide markets. Following the techniques of Fama and French (1992, 1993) portfolios are formed in December of each year and their equal weighted returns calculated for next 12 months. The Fama and French (1993)

technique first involves sorting all stocks in universe (across sample) into five portfolios ranked on December market capitalization and then these initial five portfolios to be subjected to a second sort into a further five portfolios based on individual stocks book-to-market value in December of each year. Size, or SMB, zero-cost portfolios, or valuation factors, are formed from equally weighted returns on small size portfolio minus those on large size portfolio while book-to-market valuation factor, HML, is formed from average of equally weighted returns on five high book to market value portfolios (from second sort) minus the average of equal weighted returns across five low book to market value portfolios (again from second sort). The liquidity valuation factor was constructed following Liu (2006).[4] Stocks were sorted into decile portfolios in accordance with their individual liquidity measures in December of each year. The resulting liquidity valuation factor is formed from the mean monthly returns on high illiquidity portfolio minus those on the low illiquidity portfolio and calculated on a monthly basis with annual rebalancing in December. The investor protection valuation factor was calculated using the same techniques as the Liu liquidity factor while stocks were ranked and sorted based on the size of their individual investor protection measures.

Using portfolios as test assets that are sorted on firm characteristics has become very popular when the reduction of noise in the estimated loadings is of importance. However, the benefits can be offset by the fact that portfolios can be sensitive to the characteristic that is used to sort stocks (Brennan, Chordia and Subrahmanyam, 1998). For this reason we do our analysis using individual stocks for each market, as well as portfolios as test assets.

4.3 Empirical Model

The standard capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965) states that excess returns on a stock or portfolio of stocks are positively related to those of the market. Formally this is stated in expected returns:

$$E(r_{pt}) - r_{ft} = \beta_M \left[E(r_{mt}) - r_{ft} \right] \tag{5}$$

where r_{pt} is the returns on a portfolio p of stocks at time interval t, r_{mt} is the returns on market portfolio and r_{ft} the risk free rate. This can be rearranged and estimated by OLS regression:

$$r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \varepsilon_{it} \tag{6}$$

[4] It should be noted that we did not follow Pastor and Stambaugh(2003) to construct a market wide liquidity measure, and then use the innovations in market liquidity as the liquidity factor. As Liu (2006) explains there are problems in applying that to the Liu liquidity measure.

where α_i is the constant, or Jensen alpha, β_M is market coefficient and ε_{it} is an independently identically distributed (iid) disturbance term.

Following Fama and French (1993) the one factor CAPM can be further augmented with expected returns attributable to size and book-to-market effects:

$$E(r_{pt}) - r_{ft} = \beta_M [E(r_{mt}) - r_{ft}] + \beta_{SMB} E(SMB) + \beta_{HML} E(HML) \quad (7)$$

where the additional SMB and HML terms are the size and book-to-market factors. This can be rearranged and estimated by OLS regression:

$$r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \varepsilon_{it} \quad (8)$$

Liu (2006) proposed a two-factor liquidity augmented CAPM where the expected returns from the liquidity premium alone improved the explanatory power of the three-factor Fama and French model. This takes the form:

$$E(r_{pt}) - r_{ft} = \beta_M [E(r_{mt}) - r_{ft}] + \beta_{LIQ} E(ILLIQ) \quad (9)$$

where ILLIQ is the illiquidity. Similarly, this can be rearranged and estimated by OLS regression:

$$r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{LIQ} ILLIQ_t + \varepsilon_{it} \quad (10)$$

where all terms are defined above. In this paper, a two-factor CAPM augmented with the new investor protection factor to account for institutional differences across an international market universe is proposed. This can be stated:

$$E(r_{pt}) - r_{ft} = \beta_M [E(r_{mt}) - r_{ft}] + \beta_{INV-PROTECT} E(INV - PROTECT) \quad (11)$$

where LEGAL represents the new investor protection construct. This can be rearranged and estimated by OLS regression:

$$r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{INV-PROTECT} INV - PROTECT_t + \varepsilon_{it} \quad (12)$$

All CAPMs are estimated on a time series basis, following Black, Jensen and Scholes (1972), using standard OLS techniques, following Fama and French (1993); Pastor and Stambaugh (2003); and Liu (2006)). While the sample consists of the stocks included in the blue-chip

indices in each of the world markets the combination of developed and emerging markets does present problems of inactive trading discussed by Dimson (1979) and Dimson and Marsh (1983). Their proposed trading inactivity correction has not been used here in favour of the existing literature such as Liu (2006), Pastor and Stambaugh (2003). The limitations of standard OLS should be taken into account particularly when applied to a very diverse universe of stocks such as the sample here.

4.4 Time varying parameter CAPM model

Following Brooks et al (1998) the time varying parameter analogue of the linear CAPM employs the Kalman filter and relies on the notion of "state space" in estimating the conditional constant term and market beta of the multifactor analogue of CAPM. This is represented by an observation, or measurement/signal, equation and a transition, or state, equation, that in combination express the structure and dynamics of a time varying system. A state space model is specified where an observation at time t is a linear combination of a set of variables, known as state variables, which compose the state vector at time t. Assuming the number of state variables is m and the (m x 1) vector is θ_t then the observation equation can be represented by:

$$y_t = z_t\theta_t + \mu_t, \qquad \mu_t \sim N(0,\sigma_\mu^2) \tag{13}$$

where z_t is assumed to be known (m x 1) vector, and μ_t is the observation error. The disturbance μ_t is assumed to be normally distributed with zero mean. The set of state variables is defined from the minimum set of information from past and present data and future values of time series are completely determined by the present values of the state variables, known as the Markov property. The state space model incorporates unobserved variables within, and estimates them alongside the observable model, in imposing a time varying structure of the CAPM beta. The conditional betas are estimated using the following observation, or signal equation:

$$R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + \beta_{INV-PROTECTit}^{Kalman}(INV - PROTECT) + \varepsilon_t, \quad \varepsilon_t \sim N(0,\Omega) \tag{14}$$

where R_{it} and R_{Mt} are the excess returns of individual portfolio and market portfolios at time t and ε_t is disturbance term. The exact form of the related transition equation depends on the

form of stochastic process the betas are assumed to follow and in this case a simple random walk process is imposed as outlined in Brooks et al (2000). The transition equation is defined:

$$\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t,} \quad \eta_{\alpha t} \sim N(0,Q) \tag{15}$$

$$\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t,} \quad \eta_{\beta t} \sim N(0,Q) \tag{16}$$

$$\beta_{INV-PROTECTit}^{Kalman} = \beta_{INV-PROTECTit-1}^{Kalman} + \eta_{st,} \quad \eta_{st} \sim N(0,Q) \tag{17}$$

Together equations 14 and the combination of 15 to 17 constitute a Kalman filter state space model. However a set of prior conditional values are necessary for the Kalman filter to forecast the future value and is expressed as:

$$\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0) \tag{18}$$

$$\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0) \tag{19}$$

$$\beta_{INV-PROTECT0}^{Kalman} \sim N(\beta_{INV-PROTECT0}^{Kalman}, P_0) \tag{20}$$

Brooks et al (1998) cite that this technique uses the first two observations to establish the prior conditions and then recursively estimates the entire series providing conditional estimates of $\beta_{it}^{Kalman}, \beta_{INV-PROTECTit}^{Kalman}$ and α_{it}^{Kalman}. We apply these time varying parameter techniques first to equally weighted portfolios composed of stocks constituent to markets within the geographically defined area of Asia, South Asia, Western Europe, Eastern Europe, Middle East and Africa, Australasia, North and Latin America. Next we apply the techniques to two equally weighted portfolios composed of emerging market and then developed (OECD) stocks. Finally we apply the techniques across equally weighted portfolios of stocks representing the four major legal families, namely English common law, French, German and Scandinavian civil law. The first three families are further subdivided into equally weighted portfolios of emerging and developed variants of each legal family. This accounts for very real differences between developed legal systems that have undergone significant evolution since their establishment and those of emerging markets which are usually made up of former colonies and are often underdeveloped reflecting structural rigidities in these economies (Joireman (2005); North (1994); Levine (1995)).

5. EMPIRICAL RESULTS

5.1 Relationship between investor protection, firm value and liquidity

The evidence from Table 3 reveals substantial differences in explanatory power across all investor protection models in English common law jurisdictions and those of French, German and Scandinavian civil law with the latter being considerably higher. There are notable differences in relationship between investor protection and both book-to-market value and liquidity across models. Despite low explanatory power (between 6.30 and 6.80%) investor protection has a positive and statistically significant relationship with investor protection and a corresponding negative and significant relationship with the Liu illiquidity measure. While the latter relationship is intuitively anticipated, namely that as investor protection increases and firms are more widely held there is a corresponding increase in liquidity and trading activity, the former relationship infers that as investor protection increases so does book-to-market value. There is a similar positive relationship between investor protection and book-to-market value across the aggregate English common law model and then both the developed and emerging English common law models. However in contrast there is also a positive relationship between increasing investor protection and illiquidity which is counter to the anticipated relationship. This would infer that as firms become more widely held and with generally improving levels of institutional development they have higher book-to-market values and higher illiquidity. One possible explanation for this is that as financial markets develop, being engendered by the common law legal system, that a greater number of smaller firms list on stock markets and in being small are less well known with greater uncertainty concerning their future prospects. The findings from French civil code law markets, i.e. the aggregate French and then developed and emerging French markets, reveals a contrasting picture with increasing investor protection being generally negatively related to book-to-market value and negatively related to illiquidity, which is as intuitively expected. Explanatory power of all French civil code models is notably much higher than in English common law markets. The evidence from the three German civil code law models, namely aggregate German civil code and then developed and emerging German code law, reveals that increasing investor protection is positively related to book-to-market value but negatively related to illiquidity. The findings for Scandinavian civil code law reveal that increasing investor protection is negatively related to book-to-market value while the relationship with illiquidity lacks statistical significance.

Overall the relationships between the Stoll (2000) market control variables, namely natural logarithms of price, volume and market capitalization (MV) as well as volatility (stock returns variance) with investor protection are as expected. There is a general positive

relationship between price and investor protection, inferring that better institutional development and less concentrated ownership is associated with higher price. There is a large negative relationship between investor protection and volatility while this is positive with traded volume, inferring that as investor protection improves stock volatility decreases and trading volume or activity increases. However generally there is a negative relationship between market capitalization and investor protection across all market models except for aggregate German and developed German civil code models. This is not anticipated as infers that as investor protection increases and firms become progressively more widely held they have less stock listed.

Table 3

5.2 Summary statistics relating to size-liquidity sorted portfolios and factors

Table 4 reports the descriptive statistics for the decile portfolios formed from the stock sorting process based on relative strength of investor protection measure. There is little difference across the portfolios in terms of mean, median and standard deviations from the different levels of investor protection while all portfolios have generally low levels of skewness (approximately 0) and minimal levels of kurtosis (between 5 and 6). The exception is the D4 portfolio, which exhibits both high skewness and high kurtosis. There is also a very high Jarque-Bera statistic indicating extreme non-normality, which is a common feature in emerging markets returns and time series (Lesmond, 2005).

The most striking difference in investor protection with respect to legal origin and market development is in the second panel that shows the results of the stock sorting process. There is a clear difference between developed and emerging markets across portfolios with the former overwhelmingly dominating the high investor protection portfolios (D5 to D10) and the latter dominating the weak investor protection (D5 to D1). This is expected from La Porta et al (2008), North (1991) and Levine (2005) and is due to the process of evolution of the legal systems in many developed markets that has moved away from the original institutions imposed as part of the colonial legacy in many emerging countries. The strongest support for La Porta et al (1997, 2008) comes from the dispersion of stocks in accordance to their legal origin. This suggests that stocks from English common law markets overwhelmingly dominate high investor protection portfolios (D5 to D10) with over five times as many stocks in the highest investor protection ranked portfolio than the lowest. A similar profile can be seen for Scandinavian civil code stocks though to a lesser extent due to a smaller sample while the profile for German civil code stocks reveals a concentration of these in progressively more weakly protected portfolios (D5 to D1). The profile of French civil code stocks is opposite to the common law stocks with a

concentration in the weakly protected portfolios (D5 to D1). On a regional basis the highest investor protected portfolios are dominated by North American, Australasian and Western European stocks while the weakly protected portfolios are largely in the emerging markets of South Asia, Asia, the Middle East and Africa, Eastern Europe and Latin America. Overall, this evidence provides substantial support for the legal origin literature of La Porta et al (2008) and Levine (2005) as well as work on institutional origins by North (1991).

Table 4

The evidence in Table 5 regarding the market, size, book-to-market, liquidity and investor protection factors reveals that while correlations between these are minimal and of low statistical significance the levels of non-normality are high for the size, book-to-market and liquidity factors. Jarque-Bera statistics are especially high for these three factors as are levels of skewness and kurtosis. The likelihood is that these result from outliers in some of the more segmented and highly illiquid markets, such as Bangladesh, Jamaica and Ecuador, as well as the Philippines and Latvia where non-normality statistics are very high. The presence of large and significant outliers is illustrated in Appendix Figures 1 to 5, which are a common feature of emerging market returns series where single events can cause a substantial impact in otherwise small and shallow markets.

Table 5

5.3 Comparison of CAPM models in explaining average returns

In this section, we present the results of four models using portfolios as test assets. We compare the CAPM model (Table 6, panel 1); Fama-French three factor model (Table 6, panel 2); The Liu two factor model (Table 6, panel 3); and the Investor two factor adjusted model (Table 6, panel 4). We use 5 year US Treasury yield as the risk free rate.

We make the following observations. First, the Investor two factor adjusted model shows substantial improvement in explanatory power from the single factor CAPM model and the Fama and French three factor model , However, with one exception, the size factor lacks statistical significance in the Fama and French model indicating that this is not prominent in the wider international market context. Secondly, our results confirm the Liu (2006) findings, which focussed solely on the US equity market, that the Liu two factor adjusted model offers substantial improvement in explanatory power compared to the Fama and French three factor model. Finally, while the explanatory power of the investor two factor adjusted model is higher, or as high as the two-factor Liu liquidity model, a notable exception is portfolio D4, which from

earlier evidence had the highest degree of non-normality. Furthermore, there is a general decrease in the absolute size and significance of the Jensen alpha from the liquidity to the Investor Protection augmented model. Equally the absolute size of investor protection beta is larger than that of the comparable liquidity beta providing further evidence of the superiority of the investor protection measure. An important feature of this new measure is the sign on the coefficients. These are positive in portfolios characterised by high levels of investor protection and gradually become negative in portfolios characterised by weaker levels. This indicates that there are considerable differences in governance institutions between the portfolios. As investor protection and ownership dispersion increases in portfolios D7 to D10 these are offset by increases in expected returns while the opposite result is found is less well protected stocks. This can be explained by noting that countries with weaker institutional governance and lower dispersed ownership have powerful alternative governance mechanisms where firm value is increased by systems of concentrated ownership and governance that results from such an ownership structure. This can be seen in studies of concentrated family ownership in North Africa and Middle East (Kuran (2003, 2004)) and Taiwan (Filatotchev et al, 2005) to significant direct and by state ownership in China (da Veiga et al, 2008; and Tan et al, (2008).

Table 6

5.4 Modelling market portfolios

In this section we study the application of time series CAPM factor models augmented first with both the size and book-to-market value factors of Fama and French (1993), then with the single liquidity factor of Liu (2006) and finally with our investor protection factor on the equally weighted market portfolios made up from the constituent stocks of blue-chip indices from the sixty five sample group markets. Generally we find that in almost all cases the explanatory power is incrementally increased when contrasting the two factor liquidity augmented CAPM against the Fama and French three factor size and book-to-market value model. Furthermore the single liquidity factor is negative and statistically significant across almost all individual market/ country portfolios, albeit with the sole exception of Ecuador where an extremely large and significant beta is obtained reflecting the poor fit of the model in this case. This is intuitively expected as risk-adjusted returns would decrease as illiquidity in absolute terms increases. This significance of the Liu liquidity measure is strong and persistent across markets. This is in contrast to the country by country analysis of Lee (2011) who uses the LOT measure as a proxy for liquidity and finds that either the local liquidity or the global liquidity is priced only for very few countries. It also would indicate the superiority of our liquidity measure. However the

explanatory power of the two factor models containing our investor protection factor offer only incrementally less explanatory power than that of the two-factor liquidity model for every country. Equally the investor protection beta while varying in direction (positive and negative) generally lacks the universal statistical significance across all models of the corresponding liquidity beta. While this initial examination would provide some evidence of the enhanced role of liquidity in explaining the cross section of average stock returns in relation to investor protection, the strongest evidence contrary to this perception and supporting the benefits of our investor protection measure comes from the general lack of statistical significance of the Jensen alpha (regression intercept) in virtually every country regression. Furthermore there is a significant direction (sign) change on the investor protection beta across the sixty five markets. In particular those markets with weak aggregate institutional business and legal environments commonly have large, negative and statistically significant betas, inferring that risk-premiums decrease as institutions improve. However this would be in line with Jensen and Meckling (1976) as in these countries ownership remains concentrated so the effects of external institutional improvement are lost unless ownership is widened thus dis-incentivizing likely expropriation by dominant insider groups. This is exemplified in China, Russia and several Latin American and Asian countries. However in markets with generally higher levels of institutional development the beta coefficient is large and positive indicating positive returns to increasing shareholder protection. In this case ownership is less concentrated, with greater proportions of free float capitalization so the effects of higher levels of institutional development and protection of outside investors act to align incentives of incumbent insiders and minority outsiders. Notable markets for which the model offers a very poor fit are Ecuador, Jamaica and Bangladesh. This is reflected in the extremely and sometimes negative explanatory power and general lack of significance of all asset pricing variables. These markets being small and largely inactive by world standards are likely to be significantly segmented from the world market causing the observed difficulties in modelling their average returns.

The evidence from Table 8 regarding costs of equity for each country from each of the five models, namely the CAPM, Fama and French two-factor CAPM, Liquidity CAPM and then both the time invariant Investor Protection augmented CAPM and it's time varying coefficient counterpart, reveal that generally discount rates are highest when estimated using both of the investor protection time invariant and varying parameter models. In line with the evidence from regression models in Table 7 the values for Ecuador, Jamaica and Bangladesh are likely erroneous. However it is notable that costs of equity estimates are generally similar for each country across all models within a range of plus/ minus five percent, albeit with some prominent

exceptions such as both Chinese markets where it is considerably greater when estimated using the investor protection models. These estimates are also likely influenced by relative levels of inactivity reflected in price-rigidity and lack of movement in underlying total returns series of stocks which would partially explain the markedly low estimates for Morocco, Latvia and Kenya.

Tables 7 and 8

5.5 Time varying parameter models

The evidence from the time varying parameter profiles of investor protection betas in Figures 1 to 13[5] reveals considerable differences across both geographical areas as well as legal origins (using the typology of La Porta et al (2008)). While much of the lower band of the standard error for the time varying profiles of Asia (Figure 1) and Eastern Europe (Figure 2) are negative inferring a lack of statistical significance of these investor protection betas the profile for Asia does reveal considerable volatility during the period of the recent global financial crisis from mid-2007 to mid-2010. Considerable increases in stocks exposure to the investor protection valuation factor are also revealed from the time varying profiles of Western European (Figure 3) and North American (Figure 4) portfolios over the period of recent financial crisis. These notably have the lower limits of standard errors that are positive for much of the evolution of profile inferring the statistical significance and particular importance of investor protection factor in valuation of stocks in these regions. There are also notable differences between the evolution of time varying investor protection beta profiles for equally weighted portfolios of emerging market (Figure 5) developed (OECD) (Figure 6) stocks. The former has a lower standard error band that is negative at all time during the profile evolution inferring a lack of statistical significance while the latter's profile is large in size and always positive. However the time profiles of both emerging and developed stocks reveals that they both increase their exposures to investor protection factor (and proxy for underlying state variable) during period of recent financial crisis. Figures 7 to 13 reveal the evolution of time varying investor protection beta for portfolios composed of stocks from markets falling within English common law, French or German civil code legal origins. Scandinavian civil code is omitted as convergence was not achieved. The evidence reveals that stocks in English common law markets (both emerging (Figure 7) and developed (Figure 8)) are generally less influenced by the investor protection measure during the course of the global financial crisis than in either developed French civil

[5] Time varying profiles are formed from models where convergence was achieved. Individual country time varying profiles were also estimated and are available from authors upon request.

code (Figure 9) or across all French civil code law markets (Figure 12). The same is true of German civil law markets (both emerging (Figure 10) and developed (Figure 11)) and overall (Figure 13) where there are significant increases in stocks exposure to the investor protection measure during the recent financial crisis with significant volatility during this period too. These profiles provide some indication that the structure and process of law formation in English common law markets which underscores institutional development enabled investors in these markets to have better protection from potential expropriation and loss during the period of very real uncertainty over the course of recent global financial crisis than investors in French and German civil code law markets. Consequently this evidence is supportive of the findings of La Porta et al (2002, 2008) and LLSV (2000).

Figures 1 and 13

6. CONCLUSIONS

This study studies the importance of block-shareholders and levels of institutional development within an asset pricing context across a unique and comprehensive sample of sixty five major stock markets worldwide. A new measure is developed explicitly incorporating the effects of both block-shareholding within listed firms and six institutional development characteristic indices capturing effects of government effectiveness, regulatory quality, rule of law, control of corruption, political stability and democratic voice and accountability that equally impact on listed firms.

The evidence suggests that inclusion of the new investor protection measure in asset pricing models offers improvements in capturing the cross section of average stock returns over and above the addition of size and book-to-market value factors in the Fama and French three factor model. The inclusion of this factor also offers improvements over and above a two factor liquidity augmented model though to not as great an extent. Furthermore differences in international firm-level governance arrangements are revealed through the sign on the investor protection factor such that those that are positive indicate stronger protection of property rights and lower likelihood of expropriation and more dispersed ownership. These signs are negative in countries typified with high levels of state, family and corporate block- shareholding, consistent with their national governance regimes Our findings show that the dimensions of liquidity and investor protection have implications for portfolio diversification.

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Table 1 Summary Statistics

This table presents summary statistics for the sample group markets. Datastream provides the daily prices, volume and market capitalization information. Zero returns (%) refers to the average daily zero returns per month for each constituent stock across the market index. Volume is the average of the daily trading volume over each month and is stated in millions. Market capitalization is measured as of 1 January for each country and is equity market value for each firm expressed in billions of US$. The US$ market capitalization is derived using the end of month exchange rate for each country and month. Legal Origin is defined as country's legal system falling within following legal families: Scandinavian, French, or German civil code or English Common law as defined in La Porta et al (2008). Average values are presented for each of the six political, governmental, regulatory and legal institutional quality indices (developed by Kaufman et al (2009)) across all markets. Indicators 1 to 6 have been rescaled on a 0-1 scale. Square parentheses indicate median values for each variable.

		Local market		**US$**	**Governance measures**						
Country	**Legal Origin**	**Zero Return (%)**	**Volume (m)**	**Mkt. Cap. (b)**	Free-Float (%)	Voice & Account.	Political Stability	Effect. Gov.	Reg. Quality	Rule of Law	Control of Corrupt
Europe Developed											
Austria	German	40.87 [22.73]	3.09 [0.39]	1.33 [0.44]	47.34 [40.00]	0.930	0.913	0.897	0.910	0.962	0.885
Belgium	French	6.19 [4.55]	13.05 [3.21]	8.50 [4.52]	59.67 [53.00]	0.936	0.849	0.879	0.859	0.858	0.774
Denmark	Scandinavian	16.20 [13.64]	7.88 [2.60]	4.05 [1.25]	65.95 [70.00]	0.983	0.896	0.964	0.955	0.974	0.964
Finland	Scandinavian	11.05 [9.09]	41.93 [6.61]	7.29 [1.24]	73.43 [81.00]	0.983	0.975	0.947	0.956	0.977	0.996
France	French	4.31 [0.00]	59.18 [30.97]	24.51 [14.31]	71.66 [77.76]	0.889	0.802	0.831	0.808	0.853	0.769
Germany	German	5.05 [2.38]	2.17 [0.98]	21.80 [11.13]	78.99 [86.00]	0.935	0.879	0.879	0.891	0.924	0.885
Greece	French	13.05 [10.00]	5.81 [2.65]	1.36 [0.32]	84.46 [100.00]	0.832	0.755	0.656	0.756	0.714	0.541
Iceland	Scandinavian	49.81 [38.1]	8.80 [7.51]	0.81 [0.21]	44.04 [38.00]	0.968	0.973	0.941	0.889	0.991	0.978
Ireland	Common	38.09 [29.55]	12.23 [2.77]	1.71 [0.24]	72.53 [81.50]	0.936	0.917	0.864	0.951	0.912	0.810
Italy	French	9.80 [5.00]	2.75 [0.73]	0.26 [0.13]	49.20 [42.00]	0.836	0.771	0.655	0.770	0.687	0.552
Luxembourg	French	22.69 [18.61]	0.59 [0.08]	8.38 [0.48]	57.80 [51.02]	0.960	0.987	0.922	0.967	0.968	0.909
Netherlands	French	17.86 [9.52]	24.87 [1.10]	7.02 [0.25]	63.76 [67.00]	0.984	0.903	0.937	0.968	0.939	0.941
Norway	Scandinavian	21.63 [9.09]	71.19 [20.70]	4.35 [1.11]	61.10 [63.00]	0.977	0.945	0.942	0.863	0.982	0.913
Portugal	French	27.31 [20.00]	40.52 [1.97]	2.71 [0.21]	51.28 [45.00]	0.922	0.895	0.743	0.817	0.798	0.714
Spain	French	29.26 [10.00]	42.47 [3.23]	4.33 [0.64]	51.30 [50.00]	0.885	0.736	0.814	0.845	0.818	0.744
Sweden	Scandinavian	10.93 [9.52]	101.23 [58.59]	9.29 [3.76]	75.44 [75.56]	0.979	0.934	0.947	0.909	0.963	0.956
Switzerland	French	7.33 [4.76]	51.50 [11.85]	15.88 [5.22]	79.72 [86.50]	0.960	0.963	0.968	0.923	0.982	0.940
UK	Common	6.70 [4.55]	284.96 [117.74]	21.14 [6.53]	68.82 [64.09]	0.927	0.807	0.907	0.958	0.928	0.901
Europe Emerging											
Bulgaria	German	48.49 [36.36]	0.38 [0.05]	0.05 [0.014]	65.79 [70.00]	0.707	0.727	0.511	0.675	0.504	0.414
Cyprus	French	36.32 [34.09]	4.96 [2.39]	1.16 [0.19]	98.36 [100.00]	0.845	0.735	0.745	0.837	0.741	0.651
Czech Rep.	German	56.58 [73.81]	5.85 [0.28]	2.07 [0.11]	40.57 [33.00]	0.818	0.829	0.698	0.785	0.716	0.528
Estonia	German	27.44 [25.00]	3.17 [0.29]	0.23 [0.07]	54.94 [49.00]	0.840	0.803	0.707	0.870	0.715	0.624
Hungary	German	12.25 [9.09]	7.89 [1.64]	1.84 [0.36]	62.06 [64.00]	0.862	0.830	0.686	0.813	0.727	0.592
Latvia	German	84.50 [100.00]	1.14 [0.05]	0.03 [0.0001]	60.01 [69.00]	0.783	0.768	0.622	0.777	0.637	0.493
Lithuania	German	42.33 [38.10]	1.21 [0.15]	0.17 [0.06]	58.74 [89.00]	0.805	0.796	0.636	0.788	0.640	0.505
Poland	German	13.71 [10.00]	25.56 [7.72]	3.86 [1.09]	55.22 [53.75]	0.823	0.766	0.618	0.724	0.659	0.532
Romania	French	21.37 [13.96]	24.39 [6.08]	1.27 [0.09]	54.47 [37.00]	0.680	0.690	0.462	0.613	0.496	0.381
Russia MICEX	French	14.84 [5.00]	1,435.08 [35.70]	11.19 [2.30]	72.24 [92.00]	0.393	0.478	0.412	0.460	0.323	0.232
Russia RTS	French	22.62 [9.52]	1064.16 [18.62]	8.03 [1.25]	75.06 [100.00]	0.393	0.478	0.412	0.460	0.323	0.232

Slovenia	German	10.34 [7.14]	0.10 [0.04]	0.87 [0.50]	81.56 [100.00]	0.857	0.875	0.707	0.756	0.753	0.660
Africa											
Egypt	French	34.07 [22.73]	32.12 [5.86]	0.53 [0.02]	94.71 [100.00]	0.307	0.514	0.409	0.492	0.525	0.331
Kenya	Common	52.50 [50.00]	11.58 [0.47]	0.05 [0.02]	99.02 [100.00]	0.451	0.407	0.345	0.512	0.309	0.204
Morocco	French	34.27 [28.57]	0.54 [0.03]	1.46 [0.70]	89.80 [100.00]	0.439	0.585	0.472	0.548	0.539	0.417
South Africa	Common	11.42 [9.09]	48.56 [28.65]	5.65 [2.67]	65.97 [71.00]	0.768	0.581	0.667	0.675	0.563	0.540
North America											
Canada	Common	6.37 [4.55]	19.74 [8.45]	5.59 [1.85]	81.82 [87.00]	0.966	0.890	0.931	0.912	0.944	0.902
US Nasdaq 100	Common	4.31 [4.55]	170.65 [76.81]	21.37 [8.42]	64.03 [51.21]	0.902	0.783	0.877	0.907	0.902	0.818
US S&P 100	Common	4.34 [4.55]	363.66 [187.83]	66.68 [43.45]	70.97 [58.93]	0.902	0.783	0.877	0.907	0.902	0.818
Australasia											
Australia	Common	10.81 [8.70]	89.36 [48.38]	6.12 [2.48]	75.12 [81.00]	0.945	0.887	0.917	0.926	0.945	0.894
New Zealand	Common	51.97 [50.00]	5.19 [0.79]	0.27 [0.05]	77.27 [92.50]	0.988	0.941	0.897	0.945	0.960	0.971
Latin America											
Argentina	French	30.59 [18.18]	12.81 [3.91]	3.18 [0.74]	78.53 [99.00]						
Brazil	French	20.01 [13.04]	20.23 [5.45]	2.05 [0.25]	72.99 [90.00]	0.664	0.622	0.487	0.610	0.461	0.435
Chile	French	22.24 [13.64]	302.56 [11.65]	2.45 [1.31]	40.47 [38.72]	0.806	0.790	0.769	0.884	0.816	0.756
Colombia	French	82.75 [95.12]	3.78 [0.29]	0.16 [0.09]	59.15 [77.50]	0.466	0.252	0.458	0.591	0.364	0.346
Jamaica	Common	53.50 [47.62]	4.00 [1.02]	0.39 [0.33]	100.00 [100.00]	0.730	0.586	0.504	0.623	0.421	0.345
Mexico	French	27.41 [14.29]	31.15 [5.87]	1.00 [0.44]	86.30 [100.00]	0.603	0.580	0.540	0.657	0.429	0.360
Peru	French	20.98 [19.75]	4.28 [1.25]	4.31 [1.17]	53.73 [42.00]	0.543	0.456	0.430	0.631	0.384	0.379
Venezuela	French	68.68 [77.27]	0.86 [0.07]	27.99 [0.41]	98.37 [100.00]	0.464	0.433	0.331	0.372	0.271	0.208
Asia Developed											
Japan	German	10.07 [9.09]	140,554.92 [57,838.22]	17.58 [10.32]	86.69 [89.47]	0.819	0.892	0.768	0.779	0.849	0.724
Singapore	Common	33.61 [30.43]	61,005.01 [12,909.35]	1.14 [0.21]	52.76 [44.00]	0.557	0.916	0.992	0.985	0.907	0.965
Asia Emerging											
Bangladesh	Common	43.56 [45.45]	960.36 [18.80]	0.005 [0.001]	100.00 [100.00]	0.443	0.412	0.343	0.391	0.352	0.180
China Shanghai	German	15.16 [8.70]	297.81 [73.83]	3.40 [0.28]	67.77 [100.00]	0.171	0.601	0.491	0.505	0.444	0.337
China Shenzen	German	15.31 [8.70]	191.43 [81.82]	0.98 [0.29]	68.12 [88.50]	0.171	0.601	0.491	0.505	0.444	0.337
Hong Kong	Common	24.56 [17.39]	203.61 [56.94]	3.94 [0.57]	53.71 [48.00]	0.645	0.859	0.813	0.964	0.830	0.785
India	Common	9.99 [5.00]	20.05 [8.55]	2.40 [0.37]	86.50 [100.00]	0.668	0.447	0.475	0.513	0.572	0.354
Indonesia	French	34.40 [30.43]	519.27 [167.59]	4.12 [0.41]	71.65 [100.00]	0.463	0.333	0.384	0.482	0.354	0.223
Malaysia	Common	34.79 [31.82]	23.26 [6.43]	0.79 [0.28]	72.68 [100.00]	0.470	0.707	0.697	0.673	0.645	0.521
Pakistan	Common	20.18 [5.00]	65.27 [46.20]	0.85 [0.37]	99.04 [100.00]	0.287	0.264	0.361	0.436	0.342	0.245
Philippines	French	45.84 [42.86]	71.12 [8.00]	1.62 [0.15]	77.82 [100.00]	0.587	0.437	0.464	0.570	0.435	0.297
South Korea	German	11.15 [9.09]	18.39 [9.04]	3.78 [0.66]	65.35 [67.00]	0.741	0.720	0.700	0.714	0.717	0.527
Sri Lanka	Common	34.60 [30.95]	3.19 [0.49]	0.15 [0.06]	98.52 [100.00]	0.503	0.328	0.443	0.578	0.537	0.403
Taiwan	German	11.66 [8.70]	271.02 [172.82]	3.56 [1.48]	76.92 [78.00]	0.781	0.792	0.713	0.798	0.728	0.614
Thailand	Common	26.80 [22.73]	392.46 [63.62]	0.92 [0.33]	83.88 [100.00]	0.576	0.589	0.534	0.627	0.582	0.385
Middle East											

Israel	Common	8.38 [4.55]	33.09 [7.58]	3.00 [1.24]	54.14 [49.00]	0.743	0.372	0.731	0.792	0.741	0.666
Saudi Arabia	Common	13.94 [9.52]	64.46 [20.35]	3.79 [1.47]	55.69 [54.00]	0.161	0.559	0.456	0.559	0.585	0.475
Turkey	French	22.19 [18.18]	218.36 [69.70]	1.51 [0.55]	68.12 [96.00]	0.492	0.465	0.511	0.617	0.536	0.410

Source: Indicators compiled from Kaufmann et al. (2009) "Governance Matters VIII: Governance Indicators for 1996-2008". World Bank Policy Research June 2009. These are downloadable from http://www.govindicators.org. Free Float (%) are compiled from Datastream

Table 3 Relationship between liquidity, size, and book-to-market ratio with investor protection

Unbalanced panel OLS regressions with natural logarithm of investor protection measure as dependent variable. Stoll (2000) market control variables and Liu liquidity measure as defined in Table 3.

	Intercept	Log Price	Volatility	Log Volume	Log MV	Book-to-Market	Liu	Adj R^2
Panel 1: World								
Base	6.46	0.12	-1.12	0.10	-0.13			6.32
	(60.29)	(10.22)	(-2.74)	(11.32)	(-10.67)			
Book-to-Market	6.45	0.12	-1.33	0.10	-0.13	**0.01****		6.41
	(60.15)	(10.22)	(-3.15)	(11.36)	(-10.68)	**(1.91)**		
Liquidity	6.46	0.11	-0.78	0.09	-0.12		**-0.01†**	6.71
	(60.41)	(9.14)	(-1.9)	(9.51)	(-9.70)		**(-2.65)**	
Overall	6.44	0.11	-0.98	0.09	-0.12	**0.01****	**-0.01†**	6.81
	(60.26)	(9.17)	(-2.33)	(9.59)	(-9.72)	**(1.84)**	**(-2.62)**	
Panel 2: English Common Law								
Base	6.99	0.14	-0.94	0.10	-0.16			11.25
	(265.51)	(40.45)	(-5.46)	(29.01)	(-39.02)			
Book-to-Market	6.99	0.14	-0.95	0.10	-0.16	0.001		11.24
	(266.16)	(39.77)	(-5.50)	(28.82)	(-38.79)	(0.90)		
Liquidity	6.99	0.14	-1.03	0.10	-0.16		**0.003****	11.42
	(288.01)	(36.04)	(-5.33)	(22.96)	(-35.68)		**(1.67)**	
Overall	6.99	0.14	-1.04	0.10	-0.16	0.001	**0.003****	11.43
	(287.76)	(35.26)	(-5.36)	(22.77)	(-35.39)	(1.02)	**(1.67)**	
Panel 3: Developed English Common Law								
Base	6.65	0.12	-0.79	0.06	-0.10			12.04
	(247.33)	(45.93)	(-7.34)	(32.45)	(-34.92)			
Book-to-Market	6.65	0.12	-0.81	0.06	-0.10	**0.002***		12.04
	(247.25)	(45.9)	(-7.46)	(32.48)	(-34.95)	**(1.60)**		
Liquidity	6.63	0.13	-1.03	0.08	-0.11		**0.01†**	12.52
	(246.06)	(47.06)	(-9.39)	(32.92)	(-36.66)		**(10.86)**	
Overall	6.63	0.13	-1.05	0.08	-0.11	**0.002****	**0.01†**	12.56
	(245.95)	(47.04)	(-9.56)	(32.99)	(-36.72)	**(2.14)**	**(10.96)**	
Panel 4: Emerging English Common Law								
Base	6.22	-0.01	-1.04	0.04	-0.07			8.76
	(183.00)	(-2.72)	(-3.55)	(8.69)	(-11.73)			
Book-to-Market	6.13	-0.01	-1.07	0.04	-0.06	**0.02†**		9.19
	(178.60)	(-2.25)	(-3.64)	(8.59)	(-11.15)	**(6.65)**		
Liquidity	6.23	-0.01	-1.07	0.04	-0.07		**0.001***	8.78
	(191.08)	(-2.49)	(-3.64)	(9.10)	(-12.24)		**(1.56)**	
Overall	6.14	-0.01	-1.10	0.04	-0.06	**0.02†**	**0.001***	9.26
	(186.23)	(-2.03)	(-3.72)	(9.00)	(-11.69)	**(6.73)**	**(1.58)**	
Panel 5: French Civil Code								
Base	6.48	0.22	-4.11	0.18	-0.21			19.89
	(209.81)	(36.77)	(-9.07)	(37.02)	(-39.79)			
Book-to-Market	6.48	0.22	-4.06	0.18	-0.21	**-0.004****		19.90
	(206.86)	(36.8)	(-8.81)	(36.98)	(-39.76)	**(-2.26)**		
Liquidity	6.48	0.22	-4.10	0.18	-0.21		-0.001	19.89
	(206.91)	(37.16)	(-9.00)	(39.01)	(-39.96)		(-0.09)	
Overall	6.48	0.22	-4.06	0.18	-0.21	**-0.004****	-0.001	19.92
	(204.10)	(37.18)	(-8.75)	(39.02)	(-39.96)	**(-2.26)**	(-0.09)	
Panel 6: Developed French Civil Code								
Base	6.46	0.31	-1.73	0.25	-0.27			33.79
	(100.60)	(50.28)	(-3.88)	(43.44)	(-32.42)			
Book-to-Market	6.47	0.30	-1.65	0.25	-0.27	**-0.02†**		33.85
	(100.90)	(50.29)	(-3.69)	(43.17)	(-32.25)	**(-3.24)**		
Liquidity	6.44	0.30	-1.55	0.24	-0.26		**-0.01****	33.85
	(97.47)	(49.90)	(-3.26)	(36.82)	(-29.31)		**(-1.94)**	
Overall	6.45	0.30	-1.45	0.24	-0.26	**-0.02†**	**-0.01****	33.97
	(98.11)	(49.78)	(-3.04)	(36.93)	(-29.2)	**(-3.55)**	**(-2.11)**	

	Intercept	Price	Volatility	Volume	MV	Book-to-Market	Liu	Adj R^2
Panel 7: Emerging French Civil Code								
Base	6.01	0.13	-4.69	0.11	-0.13			10.19
	(90.26)	(21.09)	(-8.05)	(14.59)	(-29.3)			
Book-to-Market	6.00	0.13	-4.78	0.11	-0.13	**0.006†**		10.22
	(89.07)	(21.29)	(-8.10)	(14.66)	(-29.42)	**(3.26)**		
Liquidity	5.99	0.14	-4.74	0.11	-0.13		**0.004†**	10.30
	(88.57)	(21.05)	(-8.04)	(14.52)	(-28.31)		**(2.61)**	
Overall	5.99	0.14	-4.84	0.11	-0.13	**0.006†**	**0.004†**	10.39
	(87.33)	(21.25)	(-8.09)	(14.58)	(-28.45)	**(3.19)**	**(2.60)**	
Panel 8: German Civil Code								
Base	4.77	-0.001	-1.70	-0.04	0.07			11.01
	(55.5)	(-0.17)	(-1.10)	(-7.90)	(9.51)			
Book-to-Market	4.55	-0.001	-2.96	-0.03	0.07	**0.19†**		14.28
	(56.58)	(-0.17)	(-2.07)	(-6.42)	(9.93)	**(15.70)**		
Liquidity	4.82	-0.01	-1.55	-0.05	0.07		**-0.02†**	11.62
	(57.46)	(-1.8)	(-1.04)	(-8.90)	(10.86)		**(-3.50)**	
Overall	4.59	-0.01	-2.81	-0.04	0.07	**0.18†**	**-0.01†**	14.72
	(57.74)	(-1.57)	(-2.02)	(-7.37)	(10.95)	**(15.07)**	**(-3.03)**	
Panel 9: Developed German Civil Code								
Base	4.74	-0.06	-0.29	0.02	0.08			27.52
	(69.42)	(-28.94)	(-0.87)	(12.17)	(18.92)			
Book-to-Market	4.64	-0.06	-0.61	0.02	0.08	**0.06†**		28.43
	(60.70)	(-27.60)	(-1.69)	(9.37)	(17.88)	**(4.84)**		
Liquidity	4.87	-0.07	-0.06	0.004	0.08		**-0.03†**	29.83
	(56.71)	(-21.97)	(-0.16)	(1.73)	(14.08)		**(-8.63)**	
Overall	4.78	-0.07	-0.36	0.002	0.09	**0.06†**	**-0.03†**	30.64
	(51.95)	(-21.56)	(-0.93)	(0.88)	(14.04)	**(4.24)**	**(-8.19)**	
Panel 10: Emerging German Civil Code								
Base	6.28	0.15	-7.30	0.07	-0.13			10.97
	(48.91)	(11.90)	(-4.35)	(7.10)	(-9.05)			
Book-to-Market	6.05	0.16	-8.52	0.09	-0.13	**0.18†**		13.91
	(50.60)	(12.72)	(-5.48)	(9.80)	(-9.83)	**(9.36)**		
Liquidity	6.30	0.14	-7.15	0.06	-0.12		**-0.01****	11.44
	(50.68)	(11.75)	(-4.34)	(6.31)	(-8.99)		**(-2.23)**	
Overall	6.07	0.15	-8.37	0.08	-0.13	**0.17†**	**-0.01****	14.27
	(51.48)	(12.69)	(-5.44)	(9.10)	(-9.85)	**(8.88)**	**(-1.91)**	
Panel 11: Scandinavian Civil Code								
Base	7.21	0.22	-1.47	0.17	-0.23			34.76
	(178.90)	(27.16)	(-3.38)	(23.43)	(-30.22)			
Book-to-Market	7.22	0.22	-1.43	0.17	-0.23	**-0.01†**		34.90
	(181.94)	(28.96)	(-3.38)	(25.20)	(-32.44)	**(-3.10)**		
Liquidity	7.21	0.23	-1.51	0.17	-0.23		0.002	34.75
	(157.07)	(23.25)	(-3.31)	(21.05)	(-24.89)		(0.36)	
Overall	7.23	0.23	-1.48	0.18	-0.24	**-0.01†**	0.002	35.07
	(153.77)	(22.93)	(-3.23)	(20.80)	(-24.61)	**(-3.33)**	(0.49)	

Notes: (1) *;**; † Denotes significance at the 10%; 5%; 1% levels

Table 4 Descriptive statistics for decile investor protection portfolios for period 2000 to 2010

This table presents the individual portfolio descriptive statistics and the count of the average number of stocks separated into each of the decile portfolios created through ranking and stock sorting using investor protection. For each year, t, every stock is ranked by its investor protection measure at the end of December in year t. Stocks are classified into 10 portfolios based on relative levels of investor protection, from the lowest to the highest. Equally weighted excess returns are generated for each portfolio at each month. Repeating this procedure for every year results in an overall sample set of 121 observations on equally weighted portfolios from January 2000 to January 2010. Annual rebalancing takes place annually every December. Value in parentheses is probability for Jarque-Bera statistic

	High	D9	D8	D7	D6	D5	D4	D3	D2	Low
Panel 1: Descriptive statistics										
Mean	0.01305	0.00971	0.01247	0.01348	0.01578	0.01480	0.03199	0.01550	0.01797	0.01672
Median	0.02280	0.01645	0.01919	0.01974	0.02060	0.02323	0.01991	0.02429	0.02492	0.02196
Std. Dev.	0.05788	0.05692	0.05900	0.06025	0.06659	0.06168	0.15341	0.05809	0.06048	0.05795
Skewness	-0.77	-0.67	-0.71	-0.73	-0.80	-0.94	6.49	-0.89	-1.08	-1.17
Kurtosis	5.89	5.72	6.45	5.35	6.44	8.26	53.56	5.99	7.29	7.67
Jarque-Bera	54.07 (0)	46.12 (0)	70.38 (0)	38.66 (0)	72.36 (0)	157.11 (0)	13734.94 (0)	61.21 (0)	116.22 (0)	137.52 (0)
Panel 2: Distribution of stocks										
Developed	313.34	282.98	210.28	164.96	108.01	120.59	88.05	120.50	102.79	71.42
Emerging	1.17	47.44	96.86	154.64	210.99	194.64	208.31	175.50	188.71	232.62
English Common Law	231.27	163.75	149.27	131.43	182.31	120.12	111.73	121.06	92.67	49.33
Scandinavian Civil Code	22.07	20.07	17.04	16.61	9.02	7.38	5.02	8.49	5.10	2.26
German Civil Code	17.44	80.85	74.28	60.42	42.54	77.38	83.79	60.09	86.06	92.07
French Civil Code	49.08	74.63	74.21	83.38	76.22	115.30	109.26	114.77	114.15	149.98
North America	106.06	76.38	64.06	41.62	29.73	22.60	16.75	20.76	15.08	2.10
Western Europe	108.69	118.58	96.33	88.72	58.31	67.92	51.77	74.74	64.31	57.09
Eastern Europe	0.79	12.83	26.83	10.97	9.17	10.52	25.67	25.79	30.12	49.26
Middle East and Africa	0.00	0.30	5.57	14.10	35.43	27.84	30.99	26.59	26.34	28.61
South Asia	0.00	0.00	0.00	2.36	52.45	29.96	26.69	25.91	8.88	6.94
Asia	17.40	93.44	103.77	133.70	168.11	167.16	153.99	145.93	152.70	127.38
Australasia	86.54	36.25	24.38	18.87	8.88	11.46	7.10	7.26	5.70	4.09
Latin America	0.38	1.53	0.69	21.57	20.12	28.67	32.89	30.10	26.59	42.40
Overall	319.86	347.35	322.24	337.79	339.31	338.73	320.21	332.40	322.16	313.11

Table 5 Summary statistics for aggregate market portfolios and equally weighted monthly excess returns on decile portfolios formed on investor protection for period 2000 to 2009

This table presents summary descriptive statistics and correlations between the market, size, book to market value, liquidity and investor protection (legal) valuation factors. Country portfolios are the equally weighted excess returns of locally listed stocks in the benchmark index in each market. Market returns are the equally weighted excess returns across all markets. Size and Book to Market Value factors follow Fama and French (1993) while liquidity valuation factor (ILLIQ) follow Liu (2006). The Investor Protection measure is constructed by ranking all stocks by their level of investor protection at the end of December in each year. Stocks are classified into 10 portfolios based on relative levels of investor protection, from the lowest to the highest. Equally weighted excess returns are generated for each portfolio at each month. Repeating this procedure for every year results in an overall sample of 121 observations on equally weighted portfolios from January 2000 to January 2010. Annual rebalancing takes place annually every December.

Market	Mean	Standard Deviation	Kurtosis	Skewness	Jarque-Bera statistic
Europe Developed					
Austria	0.00579	0.05640	-0.57	5.36	32.86 (0.00)
Belgium	0.00822	0.05993	-0.88	6.97	90.52 (0.00)
Denmark	0.01528	0.06881	-0.63	6.08	53.06 (0.00)
Finland	0.01408	0.07250	-0.20	5.80	38.37 (0.00)
France	0.00646	0.07196	-0.48	4.82	20.32 (0.00)
Germany	0.00876	0.07675	-0.63	5.26	32.07 (0.00)
Greece	0.00430	0.09780	-0.19	4.17	7.20 (0.03)
Iceland	0.00442	0.09756	2.97	27.88	3,135.40 (0.00)
Ireland	0.01084	0.07849	0.10	8.07	123.55 (0.00)
Italy	0.00265	0.07067	-0.45	4.28	11.63 (0.00)
Luxembourg	0.00558	0.07998	-1.00	6.47	76.92 (0.00)
Netherlands	0.00526	0.07018	-0.57	5.05	26.39 (0.00)
Norway	0.00888	0.08876	-0.33	4.61	14.41 (0.00)
Portugal	0.00302	0.06085	-0.43	4.03	8.67 (0.01)
Spain	0.00741	0.04973	-0.44	3.79	6.59 (0.04)
Sweden	0.01152	0.07950	-0.17	5.00	19.68 (0.00)
Switzerland	0.00727	0.06380	-0.26	3.88	5.02 (0.08)
UK	0.00830	0.05495	-0.64	6.27	59.11 (0.00)
Europe Emerging					
Bulgaria	0.03694	0.13135	1.44	8.95	209.22 (0.00)
Cyprus	-0.00349	0.12001	0.00	3.19	0.18 (0.91)
Czech Rep	0.01853	0.06600	-0.05	4.51	11.02 (0.00)
Estonia	0.02088	0.10672	0.26	7.32	90.85 (0.00)
Hungary	0.01340	0.09136	-0.26	4.69	14.98 (0.00)
Latvia	0.01034	0.05372	3.07	23.50	2,195.06 (0.00)
Lithuania	0.02282	0.08509	-0.23	6.12	47.65 (0.00)
Poland	0.02025	0.10581	-0.11	3.67	2.41 (0.30)
Romania	0.03261	0.13545	0.16	5.27	25.23 (0.00)
Russia MICEX	0.03026	0.11085	-0.54	4.85	22.05 (0.00)
Russia RTS	0.05616	0.25486	7.53	73.35	24799 (0.00)
Slovenia	0.01177	0.07077	-0.58	6.03	50.33 (0.00)
Africa					
Egypt	0.03165	0.11755	0.42	4.35	12.01 (0.00)
Kenya	0.01873	0.07831	0.10	4.56	11.85 (0.00)
Morocco	0.01255	0.05667	0.29	4.18	8.20 (0.02)
South Africa	0.01761	0.07881	-0.49	3.33	5.19 (0.07)
North America					
Canada	0.02317	0.06969	-0.89	6.21	64.79 (0.00)
United States S&P 100	0.01165	0.07294	-0.10	3.49	1.36 (0.51)
United States NASDAQ 100	0.00451	0.04727	-0.52	4.44	15.01 (0.00)
Australasia					
Australia	0.01770	0.07066	-1.02	6.63	83.00 (0.00)
New Zealand	0.01032	0.06138	-0.24	4.63	13.79 (0.00)
Latin America					
Argentina	0.01246	0.12095	-0.33	4.70	15.88 (0.00)
Brazil	0.02373	0.10781	-0.48	3.61	6.13 (0.05)

Chile	0.01454	0.06682	-0.15	6.24	50.63 (0.00)
Colombia	0.02474	0.07449	-0.09	3.27	0.50 (0.78)
Ecuador	0.81672	6.35483	8.21	71.65	23,871.97 (0.00)
Jamaica	0.00759	0.10285	3.81	29.70	3,693.59 (0.00)
Mexico	0.01980	0.09563	0.51	8.55	152.59 (0.00)
Peru	0.03204	0.11534	0.43	5.72	38.91 (0.00)
Venezuela	0.02119	0.12821	-0.12	5.67	34.41 (0.00)
Asia Developed					
Japan	0.00170	0.05600	0.02	3.05	0.02 (0.99)
Singapore	0.01627	0.09208	0.53	8.54	152.26 (0.00)
Asia Emerging					
Bangladesh	0.02650	0.08510	1.46	5.59	73.01 (0.00)
China Shanghai	0.01660	0.09779	0.18	4.10	6.48 (0.04)
China Shenzen	0.01869	0.09997	0.04	3.60	1.78 (0.41)
Hong Kong	0.01303	0.07868	-0.26	4.34	9.86 (0.01)
India	0.03474	0.11153	0.14	5.77	37.06 (0.00)
Indonesia	0.02875	0.12823	-0.62	6.96	82.40 (0.00)
Malaysia	0.00618	0.05803	0.04	3.95	4.37 (0.11)
Pakistan	0.02522	0.09907	-0.16	5.36	27.12 (0.00)
Philippines	0.02874	0.12751	3.16	23.82	2,268.97 (0.00)
South Korea	0.02244	0.10460	0.12	3.62	2.09 (0.35)
Sri Lanka	0.02888	0.10878	1.89	11.49	414.27 (0.00)
Taiwan	0.01040	0.08916	0.12	3.06	0.30 (0.86)
Thailand	0.02374	0.09910	-0.01	4.53	11.22 (0.00)
Middle East					
Israel	0.01290	0.07364	-0.11	3.28	0.64 (0.73)
Saudi Arabia	0.01715	0.09056	-0.42	4.70	17.24 (0.00)
Turkey	0.02199	0.16118	-0.21	3.79	3.8 (0.15)
Market	0.01600	0.05921	-0.79	6.79	84.96 (0.00)
Size (SMB)	-0.01658	0.07211	3.30	49.20	10,979.07 (0.00)
Book to Market Value (HML)	-0.01057	0.07184	-5.00	36.81	6,267.48 (0.00)
Liquidity (ILLIQ)	0.02081	0.14220	6.94	54.75	14,473.17 (0.00)
Investor Protection (LEGAL)	-0.00685	0.02927	-0.18	3.26	0.99 (0.61)
Correlations	Market	SMB	HML	ILLIQ	LEGAL
Market	1.0000				
SMB	0.1023	1.0000			
HML	0.0485	-0.3300†	1.0000		
ILLIQ	0.1224*	0.2412†	-0.8616†	1.0000	
LEGAL	0.0178	0.1146	-0.0376	0.0930	1.0000

Notes: (1) †;**; * Denotes significance at the 1%; 5%; 10% levels

Table 6 Time series regressions using equally weighted monthly contemporaneous market excess returns for decile portfolios formed on investor protection for period January 2000 – January 2010

This table contrasts the performance of the one factor CAPM with the three-factor model of Fama and French (1993), the two-factor model of Liu (2006) with a two-factor investor protection model including Market and Investor Protection valuation factors. Market returns are the equally weighted excess returns across markets. Size and Book to Market Value factors follow Fama and French (1993) while liquidity valuation factor (ILLIQ) follows Liu (2006). The Investor Protection measure is constructed by ranking all stocks by their level of investor protection at the end of December in each year. Stocks are classified into 10 portfolios based on relative levels of investor protection, from the lowest to the highest. Equally weighted excess returns are generated for each portfolio at each month. Repeating this procedure for every year results in an overall sample of 121 observations on equally weighted portfolios from January 2000 to January 2010. Annual rebalancing takes place annually every December. SMB and HML are tje size and book to market value factors of Fama and French (1993) while ILLIQ is the liquidity factor of Liu (2006). INV-PROTECT denotes the investor protection factor.

Panel 1 presents parameter estimates of the capital asset pricing model, CAPM:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \varepsilon_{it}$$

Panel 2 presents parameter estimates of the three-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \varepsilon_{it}$$

Panel 3 presents parameter estimates of the two-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{LIQ} ILLIQ_t + \varepsilon_{it}$$

Panel 4 presents parameter estimates of the two-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{\text{INV-PROTECT}} \text{INV - PROTECT}_t + \varepsilon_{it}$$

where r_{it} is the return of portfolio i in month t, r_{ft} is the 5-year US Treasury yield as risk free rate for month t. Numbers in parentheses are t-statistics.

	High	D9	D8	D7	D6	D5	D4	D3	D2	Low
Panel 1: CAPM-adjusted performance										
α_i	-0.0014	-0.0047	-0.0026	-0.0013	-0.0011	-0.0007	0.0074	0.0005	0.0027	0.0023
	(-0.71)	(-2.80)	(-1.69)	(-0.63)	(-0.57)	(-0.33)	(1.04)	(0.30)	(1.28)	(1.00)
$\hat{\beta}_M$	0.9059	0.9066	0.9418	0.9240	1.0603	0.9697	1.5324	0.9330	0.9501	0.8984
	(18.74)	(20.46)	(18.99)	(16.93)	(21.18)	(13.34)	(3.45)	(22.52)	(16.84)	(14.08)
Adj R^2	0.8576	0.8883	0.8924	0.8231	0.8877	0.8655	0.3443	0.9035	0.8641	0.8412
Panel 2: Fama-French three factor-adjusted performance										
α_i	0.0004	-0.0018	-0.0010	0.0008	0.0010	0.0006	-0.0079	0.0020	0.0040	0.0033
	(0.24)	(-1.20)	(-0.83)	(0.52)	(0.51)	(0.29)	(-1.22)	(1.09)	(1.70)	(1.37)
$\hat{\beta}_M$	0.8961	0.8897	0.9340	0.9132	1.0487	0.9633	1.6082	0.9257	0.9438	0.8942
	(40.63)	(41.74)	(53.63)	(30.07)	(38.09)	(25.13)	(13.82)	(30.91)	(23.27)	(21.22)
$\hat{\beta}_{SMB}$	0.0070	0.0564	-0.0061	-0.0150	-0.0005	-0.0257	0.1080	-0.0056	-0.0121	-0.0392
	(0.48)	(2.44)	(-0.22)	(-0.61)	(-0.02)	(-0.89)	(0.58)	(-0.19)	(-0.24)	(-0.86)
$\hat{\beta}_{HML}$	0.1528	0.1666	0.1444	0.2149	0.1971	0.1640	-1.5154	0.1350	0.1328	0.1540
	(8.10)	(8.00)	(3.96)	(11.88)	(11.05)	(5.53)	(-8.01)	(4.49)	(2.53)	(3.34)
Adj R^2	0.8909	0.9265	0.9232	0.8908	0.9322	0.9054	0.8758	0.9312	0.8890	0.8846

	High	D9	D8	D7	D6	D5	D4	D3	D2	Low
Panel 3: Liu two factor-adjusted performance										
α_i	-0.0002	-0.0035	-0.0012	0.0002	0.0004	0.0009	-0.0060	0.0018	0.0042	0.0038
	(-0.09)	(-2.11)	(-0.83)	(0.13)	(0.20)	(0.47)	(-1.76)	(1.02)	(2.08)	(1.83)
$\hat{\beta}_M$	0.9287	0.9290	0.9675	0.9526	1.0894	0.9994	1.2849	0.9559	0.9768	0.9268
	(36.18)	(37.27)	(56.51)	(30.92)	(43.49)	(27.11)	(23.00)	(34.98)	(29.27)	(26.59)
$\hat{\beta}_{LIQ}$	-0.0773	-0.0763	-0.0873	-0.0973	-0.0990	-0.1009	0.8417	-0.0781	-0.0908	-0.0965
	(-16.24)	(-11.29)	(-16.44)	(-9.35)	(-15.44)	(-9.38)	(12.84)	(-10.88)	(-10.87)	(-6.75)
Adj R^2	0.8925	0.9238	0.9359	0.8745	0.9315	0.9186	0.9486	0.9393	0.9087	0.8960
Panel 4: Investor Protection two factor-adjusted performance										
α_i	0.0018	-0.0034	-0.0019	-0.0011	-0.0014	-0.0013	0.0107	-0.0007	5.15E-05	-0.0013
	(1.16)	(-1.93)	(-1.21)	(-(0.49)	(-0.61)	(-0.52)	(1.13)	(-0.40)	(0.02)	(-0.88)
$\hat{\beta}_M$	0.9018	0.9049	0.9410	0.9238	1.0605	0.9705	1.5283	0.9346	0.9535	0.9031
	(18.05)	(21.08)	(18.85)	(17.01)	(21.51)	(13.59)	(3.51)	(24.49)	(20.60)	(18.19)
$\hat{\beta}_L$	0.4686	0.1915	0.0937	0.0292	-0.0321	-0.0872	0.4724	-0.1828	-0.3871	-0.5322
	(6.66)	(2.94)	(1.30)	(0.31)	(-0.40)	(-(0.85)	(0.91)	(-3.01)	(-4.21)	(-7.60)
Adj R^2	0.9135	0.8973	0.8937	0.8218	0.8870	0.8661	0.3470	0.9113	0.8986	0.9133

Table 7 Time series regression for equally weighted average country returns for period January 2000 to January 2010

This table contrasts the performance of the one factor CAPM with the three-factor model of Fama and French (1993), the two-factor model of Liu (2006) with a two-factor investor protection model including Market and Investor Protection valuation factors. Market returns are the equally weighted excess returns across markets. Size and Book to Market Value factors follow Fama and French (1993) while liquidity valuation factor (ILLIQ) follows Liu (2006). The Investor Protection measure is constructed by ranking all stocks by their level of investor protection at the end of December in each year. Stocks are classified into 10 portfolios based on relative levels of investor protection, from the lowest to the highest. Equally weighted excess returns are generated for each portfolio at each month. Repeating this procedure for every year results in an overall sample of 121 observations on equally weighted portfolios from January 2000 to January 2010. Annual rebalancing takes place annually every December. SMB and HML are the size and book to market value factors of Fama and French (1993) while ILLIQ is the liquidity factor of Liu (2006). INV-PROTECT denotes the investor protection factor.
Panel 1 presents parameter estimates of the three-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \varepsilon_{it}$$

Panel 2 presents parameter estimates of the two-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{LIQ} ILLIQ_t + \varepsilon_{it}$$

Panel 3 presents parameter estimates of the two-factor adjusted CAPM model:

$$r_{it} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{\text{INV-PROTECT}} \text{INV - PROTECT}_t + \varepsilon_{it}$$

where r_{it} is the return of portfolio i in month t, r_{ft} is the 5-year US Treasury yield as risk free rate for month t. Numbers in parentheses are t-statistics. Numbers in bold indicate statistical significance at least at 10 % level.

Explanatory Variables	$\hat{\alpha}$	$\hat{\beta}_M$	$\hat{\beta}_{SMB}$	$\hat{\beta}_{HML}$	$\hat{\beta}_{LIQ}$	$\hat{\beta}_{INV-PROTECT}$	**Adj R^2**
Panel 1: Europe Developed							
Austria	-0.0046 (-1.45)	0.7110 (11.89)	-0.0279 (-0.57)	0.1356 (2.87)			0.6123
	-0.0042 (-1.48)	0.7416 (13.00)			**-0.0887 (-6.57)**		0.6304
	-0.0049 (-1.56)	0.7146 (8.53)				0.1062 (0.96)	0.5817
Belgium	-0.0034 (-1.28)	0.7777 (11.75)	-0.0026 (-0.06)	0.1793 (4.17)			0.6329
	-0.0040 (-1.31)	0.8152 (12.25)			**-0.0926 (-4.56)**		0.6371
	-0.0029 (-0.87)	0.7847 (8.54)				**0.3659 (3.08)**	0.6214
Denmark	0.0041 (0.94)	0.9213 (18.43)	0.0388 (1.49)	0.2006 (8.74)			0.6841
	0.0027 (0.66)	0.9679 (19.02)			**-0.1020 (-7.81)**		0.6910
	0.0025 (0.53)	0.9361 (13.19)				**0.2006 (1.55)**	0.6538
Finland	-0.0004 (-0.14)	1.0113 (21.45)	0.0882 (3.05)	0.1484 (4.31)			0.7508
	-0.0025 (-0.97)	1.0528 (21.56)			**-0.0741 (-3.52)**		0.7531
	-0.0007 (-0.21)	1.0272 (16.70)				**0.4362 (4.02)**	0.7639
France	-0.0054 (-1.94)	0.9877 (18.23)	0.1322 (2.14)	0.2133 (3.80)			0.7648
	-0.0085 (-3.02)	1.0488 (17.76)			**-0.1091 (-4.52)**		0.7691
	-0.0075 (-2.69)	1.0132 (14.49)				**0.3922 (3.72)**	0.7476
Germany	-0.0033 (-1.08)	1.0328 (15.98)	0.1573 (2.22)	0.2702 (4.23)			0.7522
	-0.0072 (-2.24)	1.1064 (15.31)			**-0.1296 (-4.86)**		0.7505
	-0.0072 (-2.14)	1.0657 (12.61)				**0.3004 (2.58)**	0.7050
Greece	-0.0149 (-2.79)	1.1751 (13.76)	0.0491 (0.88)	0.242 (4.33)			0.5054
	-0.0163 (-3.02)	1.2371 (14.60)			**-0.1418 (-7.38)**		0.5223
	-0.0185 (-3.26)	1.1953 (9.58)				0.0135 (0.06)	0.4825

Iceland	-0.0046 (-0.36)	0.7360 (3.86)	-0.201 (-0.87)	-0.1453 (-0.48)			0.1175
	0.0020 (0.16)	0.7245 (3.67)			**-0.0753 (-1.86)**		0.1175
	0.0042 (0.29)	0.6981 (3.30)				**0.4890 (1.28)**	0.1242
Ireland	-0.0045 (-1.09)	1.0509 (12.19)	-0.0482 (-1.21)	0.2294 (3.70)			0.7077
	-0.0046 (-1.08)	1.0881 (10.36)			**-0.1011 (-4.78)**		0.6899
	-0.0042 (-0.99)	1.0559 (8.42)				**0.2838 (2.29)**	0.6669
Italy	-0.0102 (-2.45)	0.9435 (21.02)	-0.0038 (-0.08)	0.1627 (3.22)			0.6648
	-0.0099 (-2.67)	0.9907 (21.72)			**-0.1295 (-8.12)**		0.7080
	-0.0111 (-2.72)	0.9514 (13.42)				0.1352 (0.87)	0.6423
Luxembourg	-0.0091 (-2.23)	1.0957 (14.02)	-0.0079 (-0.14)	0.1930 (2.47)			0.6899
	-0.0090 (-2.33)	1.1452 (15.31)			**-0.1333 (-8.40)**		0.7174
	-0.0092 (-2.06)	1.1035 (10.34)				**0.2854 (1.91)**	0.6724
Netherlands	-0.0080 (-2.80)	0.9892 (23.80)	0.0308 (0.82)	0.1713 (3.7)			0.7619
	-0.0087 (-3.18)	1.0376 (23.36)			**-0.1170 (-8.35)**		0.7927
	-0.0085 (-2.74)	1.0005 (16.20)				**0.2976 (2.64)**	0.7507
Norway	-0.0047 (-0.90)	1.1471 (13.95)	0.1457 (1.95)	0.1989 (2.44)			0.6403
	-0.0075 (-1.47)	1.2180 (13.65)			**-0.1394 (-4.31)**		0.6661
	-0.0081 (-1.44)	1.1750 (13.16)				**0.2280 (1.42)**	0.6215
Portugal	-0.0060 (-1.39)	0.8014 (21.43)	-0.0122 (-0.20)	0.1348 (2.03)			0.5695
	-0.0054 (-1.35)	0.8433 (21.80)			**-0.1206 (-8.49)**		0.6199
	-0.0056 (-1.18)	0.8057 (13.07)				**0.2488 (1.72)**	0.5615
Spain	-0.0017 (-0.67)	0.6728 (20.26)	0.0246 (0.94)	0.1102 (3.79)			0.6426
	-0.0024 (-0.92)	0.7027 (19.75)			**-0.0693 (-7.59)**		0.6611
	-0.0028 (-1.11)	0.6815 (16.71)				0.0928 (0.79)	0.6265
Sweden	-0.0035 (-1.17)	1.0996 (25.31)	0.1379 (2.78)	0.1661 (3.83)			0.7522
	-0.0067 (-2.42)	1.1496 (19.71)			**-0.0785 (-2.71)**		0.748
	-0.0064 (-2.22)	1.1245 (21.70)				**0.2335 (2.74)**	0.7353
Switzerland	-0.0019 (-0.52)	0.8359 (14.10)	0.0723 (1.31)	0.2332 (4.51)			0.7064
	-0.0039 (-1.16)	0.8948 (13.56)			**-0.1232 (-8.67)**		0.7227
	-0.0027 (-0.79)	0.8546 (12.13)				**0.4559 (3.38)**	0.6909
UK	-0.0012 (-0.54)	0.7849 (27.55)	0.0912 (2.21)	0.1969 (4.65)			0.8111
	-0.0037 (-1.68)	0.8344 (33.86)			**-0.0901 (-6.17)**		0.8066
	-0.0040 (-1.57)	0.8064 (16.38)				**0.1707 (2.48)**	0.7606
Panel 2: Europe Emerging							
Bulgaria	0.0092 (0.63)	1.1339 (6.37)	-0.4896 (-2.13)	-0.2334 (-0.91)			0.2414
	0.0214 (1.54)	1.0669 (5.32)			-0.0262 (-0.31)		0.1900
	0.0214 (1.58)	1.0586 (5.07)				0.0626 (0.18)	0.1894
Cyprus	-0.0243 (-2.54)	1.2903 (11.42)	0.1517 (2.23)	-0.0070 (-0.11)			0.4124
	-0.0262 (-2.70)	1.3226 (10.28)			-0.0470 (-0.89)		0.4119
	-0.0264 (-2.85)	1.3080 (10.72)				0.0878 (0.25)	0.4092
Czech Rep.	0.0071 (1.26)	0.6954 (8.55)	-0.0706 (-1.22)	0.1679 (2.27)			0.4301

	0.0082 (1.44)	0.7277 (8.43)			**-0.1063 (-4.65)**		0.4380
	0.0078 (1.37)	0.6949 (5.82)				0.1822 (0.98)	0.3915
Estonia	0.0061 (0.56)	0.9082 (4.62)	-0.1568 (-1.16)	0.1343 (1.00)			0.2608
	0.0090 (0.86)	0.9240 (4.56)			**-0.0933 (-2.57)**		0.2562
	0.0085 (0.82)	0.8953 (4.17)				0.1474 (0.66)	0.2420
Hungary	-0.0027 (-0.41)	1.068 (13.63)	-0.1121 (-2.09)	0.1804 (3.01)			0.4855
	-0.0005 (-0.08)	1.1041 (13.66)			**-0.1341 (-3.86)**		0.4965
	-0.0028 (-0.36)	1.0648 (9.91)				-0.0122 (-0.05)	0.4540
Latvia	0.0036 (0.68)	0.3706 (5.31)	-0.0573 (-1.72)	0.1145 (2.81)			0.1855
	0.0038 (0.68)	0.3799 (5.13)			**-0.0328 (-1.59)**		0.1619
	0.0048 (0.77)	0.3684 (4.67)				0.2121 (1.12)	0.1679
Lithuania	0.0064 (0.73)	0.7919 (4.88)	-0.1962 (-1.88)	0.1386 (1.28)			0.3412
	0.0096 (1.11)	0.7959 (4.43)			**-0.0692 (-1.44)**		0.3037
	0.0078 (0.93)	0.7765 (4.22)				-0.0984 (-0.54)	0.2911
Poland	0.0024 (0.38)	1.2155 (15.28)	-0.0087 (-0.11)	0.1468 (1.67)			0.4667
	0.003 (0.49)	1.2627 (15.74)			**-0.1349 (-5.26)**		0.4937
	0.0045 (0.69)	1.2185 (13.04)				**0.5244 (2.53)**	0.4821
Romania	0.0142 (1.09)	1.1874 (5.23)	0.0230 (0.13)	0.3366 (2.17)			0.2823
	0.0119 (0.96)	1.2472 (5.16)			**-0.1263 (-1.66)**		0.2754
	0.0058 (0.47)	1.2152 (4.92)				**-0.5865 (-1.94)**	0.2742
Russia MICEX	0.0098 (1.18)	1.3096 (11.09)	-0.0707 (-1.86)	0.2003 (3.82)			0.5014
	0.0108 (1.34)	1.3492 (11.1)			**-0.1247 (-4.22)**		0.508
	0.0073 (0.88)	1.3144 (8.72)				-0.2102 (-0.85)	0.4855
Russia RTS	0.0303 (1.63)	1.1452 (4.17)	-0.5442 (-1.02)	0.2981 (1.00)			0.0855
	0.0372 (1.58)	1.0997 (3.14)			-0.0160 (-0.12)		0.0518
	0.0359 (1.44)	1.0963 (3.3)				-0.1521 (-0.50)	0.052
Slovenija	-0.0044 (-0.51)	0.7134 (5.16)	-0.1824 (-1.95)	0.0496 (0.53)			0.3691
	-0.0009 (-0.11)	0.7050 (4.87)			-0.0389 (-1.02)		0.3363
	-0.0043 (-0.51)	0.6970 (5.08)				**-0.3883 (-1.91)**	0.3567
Panel 3: Africa							
Egypt	0.0111 (0.9)	1.0323 (7.01)	-0.0803 (-0.81)	0.2111 (2.19)			0.2812
	0.0124 (1.04)	1.0742 (7.29)			**-0.1341 (-4.24)**		0.2901
	0.0052 (0.49)	1.0410 (6.51)				**-0.7088 (-2.23)**	0.2955
Kenya	0.0068 (0.85)	0.5473 (4.64)	-0.1048 (-1.41)	0.0825 (1.11)			0.1705
	0.0087 (1.07)	0.5551 (4.60)			**-0.0544 (-2.44)**		0.1669
	0.0074 (0.81)	0.5396 (4.37)				-0.0569 (-0.24)	0.1573
Morocco	0.0041 (0.94)	0.3665 (4.31)	-0.1144 (-2.32)	0.1072 (2.08)			0.1679
	0.0062 (1.34)	0.3813 (4.31)			**-0.0776 (-2.19)**		0.1597
	0.0029 (0.63)	0.3611 (3.63)				**-0.2926 (-1.74)**	0.1453
South Africa	0.0023 (0.51)	1.0163 (15.99)	0.0723 (2.07)	0.1773 (4.71)			0.6357
	0.0002 (0.05)	1.0597 (16.65)			**-0.0814 (-5.52)**		0.6367
	0.0018 (0.40)	1.0322 (15.25)				**0.4090 (3.03)**	0.6386

Panel 4: North America							
Canada	0.0095 (2.89)	0.9716 (17.45)	0.0180 (0.41)	0.1342 (2.90)			0.7376
	0.0088 (2.79)	1.0046 (18.86)			**-0.0777 (-5.09)**		0.7473
	0.0107 (3.72)	0.9778 (12.67)				**0.4439 (3.94)**	0.7579
United States S&P 100	-0.0016 (-0.55)	0.6116 (13.92)	0.1394 (1.95)	0.1492 (2.11)			0.6873
	-0.0050 (-1.75)	0.6549 (13.82)			**-0.0586 (-2.60)**		0.6565
	-0.0041 (-1.61)	0.6354 (14.9)				**0.2671 (3.07)**	0.6533
United States NASDAQ 100	0.0041 (1.14)	0.8639 (11.46)	0.2807 (3.67)	0.0469 (0.50)			0.5703
	-0.0007 (-0.18)	0.9187 (9.11)			-0.0579 (-0.92)		0.5182
	0.0002 (0.04)	0.8993 (9.80)				**0.2622 (1.65)**	0.5167
Panel 5: Australasia							
Australia	0.0024 (0.84)	1.0337 (17.37)	0.0358 (1.32)	0.1513 (4.48)			0.7879
	0.0009 (0.3)	1.065 (17.86)			**-0.0611 (-6.39)**		0.7833
	0.0017 (0.56)	1.0448 (14.7)				**0.2461 (2.42)**	0.7787
New Zealand	-0.0042 (-1.14)	0.7817 (13.89)	-0.0450 (-1.29)	0.1180 (3.11)			0.5756
	-0.0042 (-1.14)	0.7817 (13.89)			**-0.0450 (-1.29)**		0.5862
	-0.0025 (-0.62)	0.7803 (13.42)				**0.3114 (2.35)**	0.5745
Panel 6: Latin America							
Argentina	-0.0047 (-0.35)	0.9912 (7.47)	-0.0741 (-1.15)	0.1959 (2.20)			0.2443
	-0.0039 (-0.3)	1.0254 (7.43)			**-0.1083 (-3.11)**		0.2477
	-0.0099 (-0.69)	0.9990 (7.94)				**-0.6165 (-1.35)**	0.2543
Brazil	0.0033 (0.54)	1.3313 (10.14)	-0.0264 (-0.27)	0.1970 (2.22)			0.5609
	0.0039 (0.65)	1.3828 (9.9)			**-0.1469 (-2.88)**		0.5832
	0.0021 (0.34)	1.3388 (9.51)				0.0910 (0.46)	0.5454
Chile	-0.0014 (-0.38)	0.8245 (12.88)	-0.1320 (-3.37)	0.0340 (0.71)			0.5352
	0.0016 (0.41)	0.8278 (11.53)			**-0.0604 (-1.31)**		0.5302
	-3.11E-05 (-0.01)	0.8108 (10.21)				-0.0923 (-0.54)	0.5152
Colombia	0.0096 (1.31)	0.7164 (10.57)	-0.1168 (-4.42)	0.1485 (4.94)			0.3474
	0.0112 (1.6)	0.7319 (9.88)			**-0.0726 (-1.86)**		0.3274
	0.0093 (1.41)	0.7115 (7.59)				-0.1061 (-0.46)	0.3099
Ecuador	-0.3196 (-1.05)	31.3607 (5.39)	9.6475 (1.05)	-72.0886 (-7.61)			0.8417
	-0.3245 (-1.98)	16.3572 (5.35)			**40.6842 (9.92)**		0.9309
	0.5491 (1.26)	28.0444 (1.29)				**31.229 (1.28)**	0.0797
Jamaica	0.0085 (0.72)	0.0672 (0.58)	0.0362 (0.69)	0.1414 (2.61)			-0.016
	0.0067 (0.61)	0.0878 (0.73)			-0.0257 (-0.91)		-0.0143
	0.0053 (0.53)	0.0822 (0.68)				-0.1179 (-0.54)	-0.0145
Mexico	0.0013 (0.26)	1.1957 (13.58)	-0.0268 (-0.78)	0.3325 (7.55)			0.6191
	0.0009 (0.17)	1.2638 (13.97)			**-0.1764 (-8.85)**		0.6242
	-0.0018 (-0.33)	1.2118 (8.80)				0.0218 (0.09)	0.5553
Peru	0.0084 (0.99)	1.1873 (11.54)	-0.2064 (-2.3)	0.3093 (3.78)			0.4289
	0.0116 (1.4)	1.2339 (10.29)			**-0.184 (-3.34)**		0.4137
	0.0047 (0.62)	1.1848 (6.61)				**-0.5696 (-2.17)**	0.3830

Venezuela	0.0177 (1.47)	0.3498 (1.79)	0.0208 (0.17)	0.1624 (1.26)			0.0120
	0.0159 (1.37)	0.3699 (2.02)			-0.0270 (-0.61)		0.0133
	0.0163 (1.31)	0.3609 (2.05)				0.1185 (0.31)	0.0131
Panel 7: Asia Developed							
Japan	-0.0058 (-1.49)	0.6323 (14.86)	0.0747 (2.26)	0.0992 (2.33)			0.4651
	-0.0080 (-2.22)	0.6519 (14.01)			-0.0152 (-0.99)		0.4539
	-0.0071 (-1.83)	0.6459 (15.14)				**0.1687 (1.39)**	0.4603
Singapore	-0.0047 (-1.32)	1.2762 (12.7)	-0.0514 (-1.16)	0.3141 (6.24)			0.7376
	-0.0054 (-1.47)	1.3241 (11.58)			**-0.1217 (-6.72)**		0.7064
	-0.0083 (-2.11)	1.2894 (9.33)				-0.1274 (-0.74)	0.6732
Panel 8: Asia Emerging							
Bangladesh	0.0232 (2.33)	0.0491 (0.32)	-0.0547 (-0.57)	-0.1221 (-1.17)			-0.0147
	0.0255 (2.54)	0.0333 (0.21)			0.0062 (0.25)		-0.0162
	0.0249 (2.69)	0.036 (0.24)				-0.1017 (-0.35)	-0.015
China Shanghai	0.0064 (0.61)	0.6454 (4.06)	-0.1026 (-0.55)	-0.0503 (-0.27)			0.1334
	0.0103 (0.98)	0.6555 (4.59)			**-0.0878 (-3.58)**		0.1522
	-0.0035 (-0.41)	0.6453 (6.12)				**-1.7692 (-5.40)**	0.4292
China Shenzhen	0.0091 (0.85)	0.6641 (4.12)	-0.0913 (-0.49)	-0.0200 (-0.11)			0.1355
	0.0127 (1.19)	0.6821 (4.7)			**-0.1040 (-4.07)**		0.1613
	-0.0018 (-0.19)	0.6676 (6.34)				**-1.8217 (-5.62)**	0.4362
Hong Kong	-0.0016 (-0.42)	1.0961 (19.62)	0.0242 (0.50)	0.1624 (2.86)			0.6786
	-0.0026 (-0.66)	1.133 (19.76)			**-0.0828 (-5.27)**		0.6832
	-0.0043 (-1.13)	1.1091 (17.14)				-0.056 (-0.55)	0.6621
India	0.0105 (1.56)	1.4097 (15.25)	-0.1080 (-1.89)	0.3034 (5.68)			0.6181
	0.011 (1.68)	1.4511 (14.19)			**-0.1258 (-2.89)**		0.5936
	0.0086 (1.31)	1.4146 (11.49)				-0.0576 (-0.29)	0.5676
Indonesia	0.0041 (0.42)	1.3762 (7.95)	-0.1468 (-2.62)	0.5683 (9.12)			0.5078
	0.0042 (0.43)	1.4627 (7.90)			**-0.2425 (-3.98)**		0.4587
	-0.0026 (-0.25)	1.3950 (5.76)				**-0.4097 (-1.49)**	0.3972
Malaysia	-0.0033 (-0.72)	0.636 (11.62)	-0.0440 (-0.75)	0.1335 (1.62)			0.4147
	-0.0027 (-0.62)	0.6629 (13.13)			**-0.0837 (-7.23)**		0.4246
	-0.0064 (-1.36)	0.6413 (10.78)				**-0.3370 (-1.82)**	0.4127
Pakistan	0.0148 (1.55)	0.5462 (3.84)	-0.1153 (-0.79)	-0.0492 (-0.32)			0.0757
	0.0181 (1.95)	0.5395 (3.91)			-0.0360 (-1.13)		0.0801
	0.0171 (1.68)	0.5294 (4.12)				-0.0585 (-0.17)	0.0779
Philippines	0.0189 (1.49)	0.7458 (3.88)	-0.4072 (-1.56)	0.4143 (1.86)			0.1587
	0.023 (1.65)	0.7427 (3.87)			-0.0790 (-1.03)		0.0687
	0.0186 (1.26)	0.7233 (3.75)				**-0.4439 (-1.47)**	0.0707
South Korea	0.0025 (0.35)	1.3416 (11.47)	0.0831 (0.7)	0.2585 (2.11)			0.6111
	-0.0005 (-0.08)	1.3957 (12.54)			**-0.0968 (-3.66)**		0.6035
	-0.0032 (-0.49)	1.3687 (12.83)				-0.1663 (-0.64)	0.5885
Sri Lanka	0.0204 (2.1)	0.4418 (3.37)	-0.0599 (-0.69)	0.2324 (2.35)			0.0679

	0.0208 (2.24)	0.4834 (3.51)			**-0.1206 (-4.54)**		0.0709
	0.0192 (1.93)	0.4475 (2.8)				0.0513 (0.21)	0.0455
Taiwan	-0.0061 (-1.03)	0.9784 (12.24)	-0.1608 (-3.21)	0.204 (3.58)			0.4534
	-0.0033 (-0.57)	1.0102 (12.07)			**-0.1352 (-2.17)**		0.4458
	-0.0064 (-1.06)	0.9716 (8.08)				-0.1374 (-0.58)	0.4018
Thailand	0.0052 (0.75)	1.1585 (11.48)	-0.0425 (-0.66)	0.4518 (5.65)			0.5728
	0.0031 (0.42)	1.2229 (13.44)			**-0.1465 (-5.77)**		0.5073
	-0.0007 (-0.08)	1.1816 (10.76)				-0.1996 (-0.54)	0.4684
Panel 9: Middle East							
Israel	0.0063 (1.33)	0.7489 (12.15)	0.145 (1.57)	0.0462 (0.41)			0.3578
	0.0044 (0.91)	0.7946 (12.74)			**-0.0848 (-2.31)**		0.3716
	0.0044 (0.82)	0.768 (12.45)				0.1892 (1.13)	0.3518
Saudi Arabia	0.0107 (1.03)	0.4426 (2.52)	0.0064 (0.1)	0.0422 (0.7)			0.067
	0.0105 (1.04)	0.4532 (2.56)			-0.025 (-0.82)		0.0754
	0.0088 (0.92)	0.4474 (2.57)				-0.1744 (-0.69)	0.0772
Turkey	-0.0018 (-0.15)	1.7531 (10.18)	0.2948 (3.31)	0.0686 (0.83)			0.4421
	-0.0079 (-0.68)	1.7964 (9.23)			-0.0086 (-0.09)		0.431
	-0.0104 (-0.89)	1.7968 (8.92)				-0.3374 (-1.17)	0.4348

Table 8 Cost of equity comparison between different valuation models

This table presents the estimates of cost of equity across all sample group markets from five different valuation models, namely one factor CAPM, Fama and French three factor CAPM augmented with size and book-to-market value factors, two-factor liquidity augmented CAPM, and finally a time invariant and a time varying parameter two-factor investor protection augmented CAPM. Annualized cost of equity estimates generated at 12/2010 from the total risk premium. The five year US Treasury yield was used as risk free rate.

Market	CAPM	FF CAPM	Liquidity CAPM	Investor Protect CAPM	Time varying Investor Protect CAPM
Europe Developed					
Austria	17.36	16.15	15.42	16.50	15.50
Belgium	18.88	16.57	16.85	15.91	17.63
Denmark	22.03	18.57	19.79	20.40	22.87
Finland	23.98	20.19	22.36	20.44	No converge
France	23.69	18.11	21.29	20.50	27.66
Germany	24.76	17.92	21.93	22.33	29.36
Greece	27.43	23.21	24.33	27.32	36.50
Iceland	17.08	23.18	15.43	13.12	No converge
Ireland	24.55	22.53	22.34	22.25	18.86
Italy	22.33	20.27	19.50	21.24	25.64
Luxembourg	25.55	23.17	22.64	23.24	23.09
Netherlands	23.39	20.49	20.84	20.98	22.09
Norway	27.04	21.39	23.99	25.20	34.04
Portugal	19.30	17.77	16.65	17.28	20.36
Spain	16.66	14.70	15.15	15.91	21.78
Sweden	25..98	20.92	24.27	24.09	No converge
Switzerland	20.36	15.78	17.67	16.66	23.09
UK	19.30	14.80	17.33	17.91	23.48
Europe Emerging					
Bulgaria	24.57	37.83	24.00	24.06	28.91
Cyprus	29.81	26.75	28.78	29.10	34.86
Czech Rep	16.96	16.21	14.63	15.48	17.49
Estonia	21.16	22.65	19.12	19.96	17.40
Hungary	24.69	24.64	21.75	24.79	31.85
Latvia	10.11	9.79	9.39	8.39	3.85
Lithuania	18.62	20.87	17.11	19.42	17.28
Poland	28.01	26.25	25.06	23.76	No converge
Romania	27.74	22.82	24.98	32.49	23.94
Russia MICEX	29.89	28.78	27.16	31.59	30.53
Russia RTS	25.32	32.70	24.97	26.56	No converge
Slovenia	16.90	20.04	16.05	20.04	14.90
Africa					
Egypt	24.06	22.94	21.13	29.80	27.10
Kenya	13.66	14.75	12.47	12.24	19.05
Morocco	9.85	10.83	8.17	14.12	7.91
South Africa	24.08	20.24	22.30	20.76	32.09
North America					
Canada	22.95	20.80	21.25	19.35	24.54
US S&P 100	15.72	10.86	14.44	13.56	20.52
US NASDAQ 100	21.26	14.81	20.00	19.14	32.22
Australasia					
Australia	21.14	19.62	20.32	18.82	24.12
New Zealand	18.78	18.15	18.31	16.25	No converge
Latin America					
Argentina	23.19	22.15	20.82	28.19	29.71
Brazil	30.46	28.41	27.25	29.72	44.93
Chile	19.34	21.64	18.02	20.09	25.27
Colombia	17.25	17.72	15.67	18.11	17.58
Ecuador	596.73	1,347.79	1,486.35	343.57	48.63
Jamaica	4.03	1.40	3.46	5.00	No converge
Mexico	27.78	23.95	23.92	27.60	30.46

Peru	27.10	27.31	23.08	31.72	45.25
Venezuela	9.94	7.36	9.35	8.98	12.65
Asia Developed					
Japan	15.93	13.07	15.60	14.56	19.19
Singapore	29.38	26.30	26.72	30.41	32.88
Asia Emerging					
Bangladesh	3.08	5.83	3.21	3.90	7.32
China Shanghai	15.56	18.35	13.64	29.90	34.42
China Shenzen	16.02	18.18	13.74	30.78	37.37
Hong Kong	25.61	22.96	23.80	26.06	29.49
India	32.02	30.26	29.27	32.49	40.34
Indonesia	31.54	27.09	26.24	34.86	32.17
Malaysia	15.74	14.89	13.91	18.47	No converge
Pakistan	13.44	16.49	12.65	13.92	8.37
Philippines	17.44	20.44	15.71	21.04	17.40
South Korea	31.04	25.89	28.92	32.38	No converge
Sri Lanka	11.74	9.92	9.11	11.33	1.64
Taiwan	22.71	23.36	19.75	23.82	33.09
Thailand	27.10	22.02	23.90	28.72	No converge
Middle East					
Israel	18.49	14.87	16.64	16.96	No converge
Saudi Arabia	11.70	11.01	11.15	13.11	3.65
Turkey	39.99	32.95	39.80	42.73	63.75

Figure 1. Time varying investor protection beta for Asia

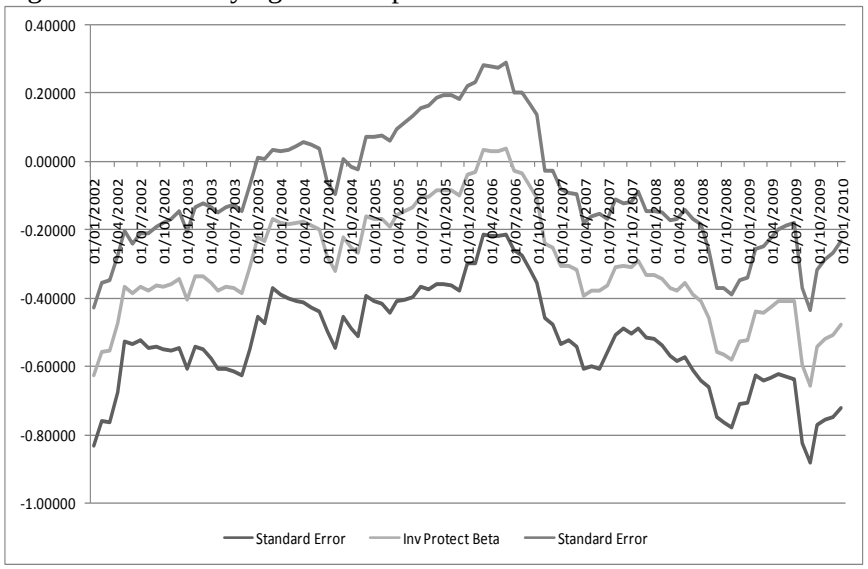


Figure 2. Time varying investor protection beta for Eastern Europe

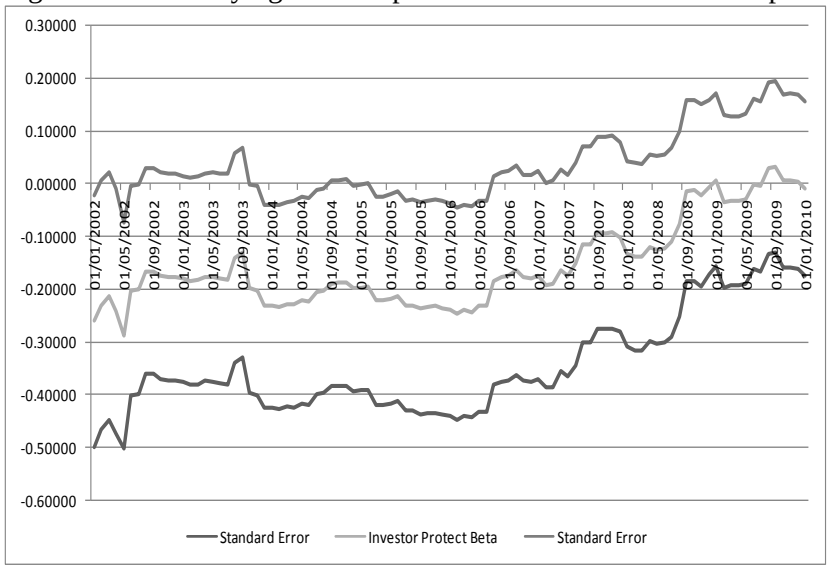


Figure 3. Time varying investor protection beta for Western Europe

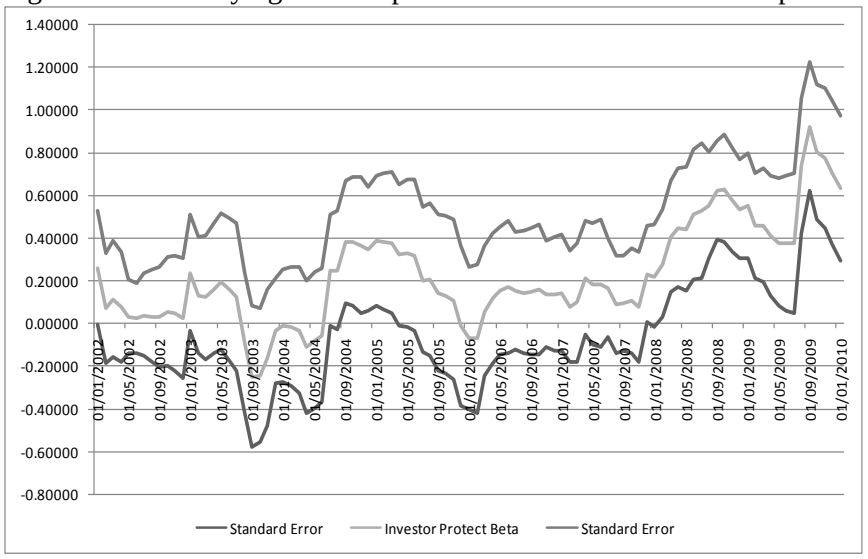


Figure 4. Time varying investor protection beta for North America

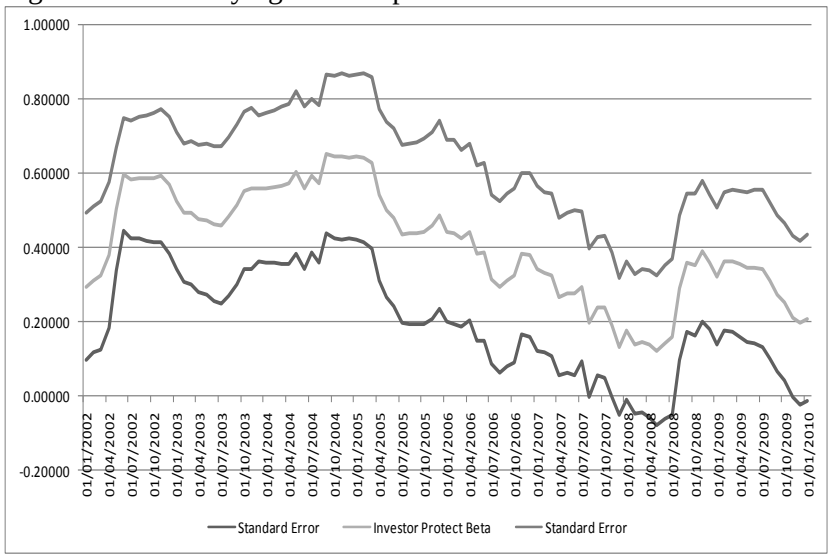


Figure 5. Time varying investor protection beta for Emerging Markets

Figure 6. Time varying investor protection beta for Developed

Figure 7. Time varying investor protection beta for Emerge Common Law

Figure 8. Time varying investor protection beta for Dev. Common Law

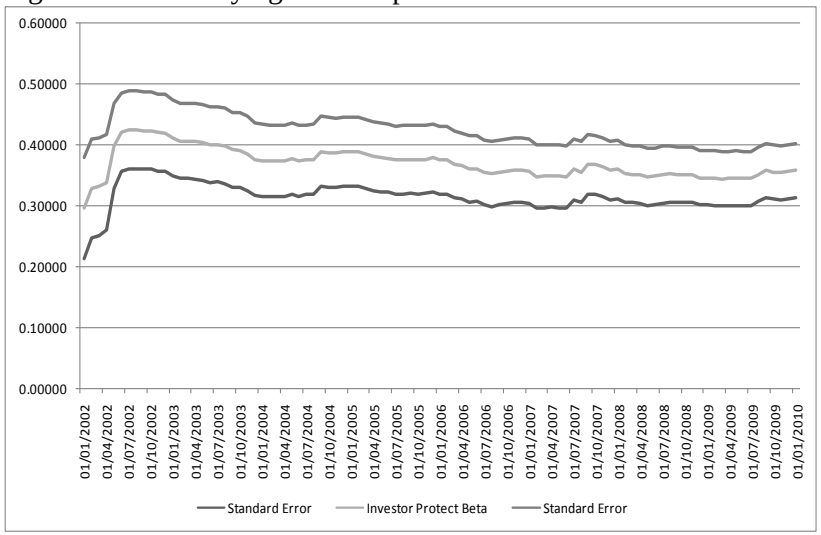


Figure 9. Time varying investor protection beta for Dev. French Civil

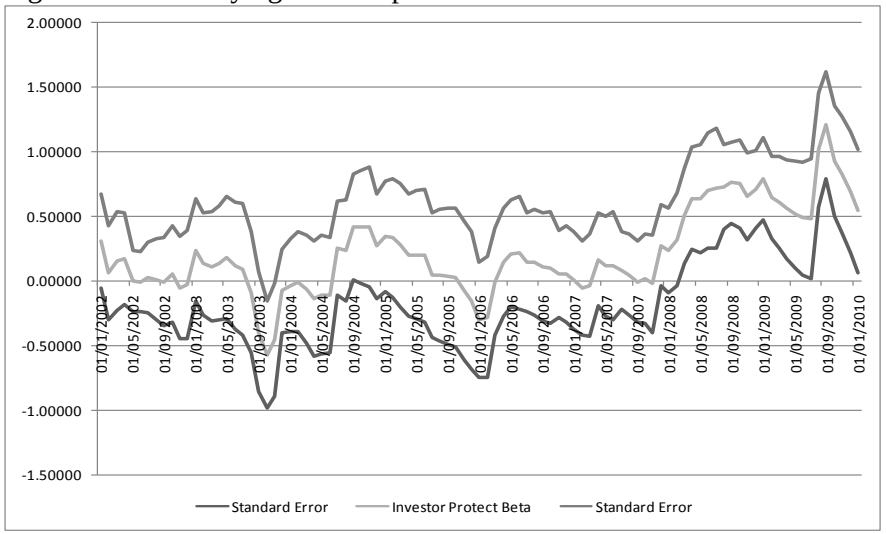


Figure 10. Time varying investor protection beta for Emerge German Civil

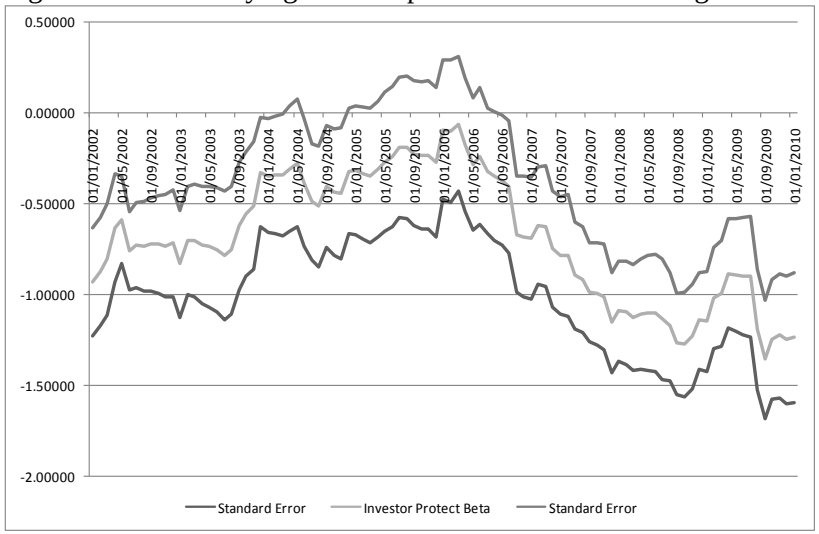


Figure 11. Time varying investor protection beta for Dev. German Civil

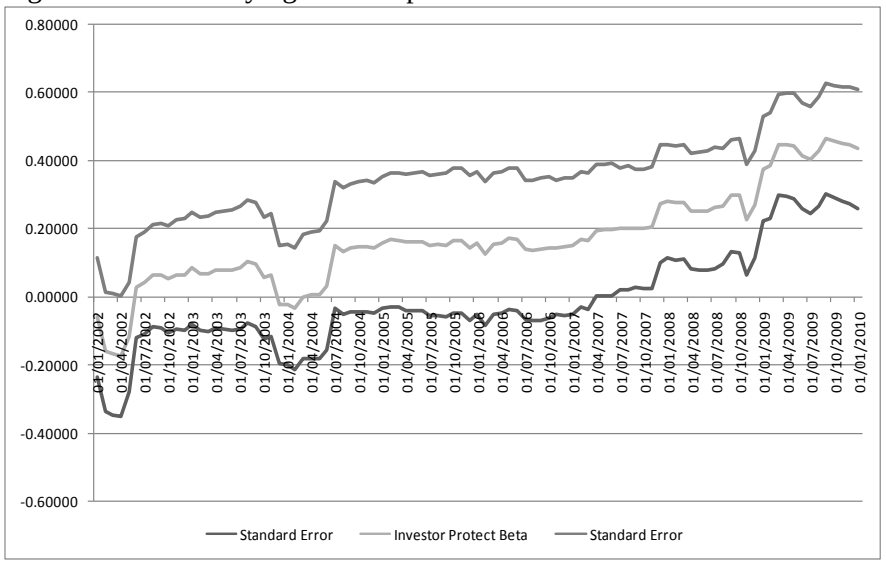
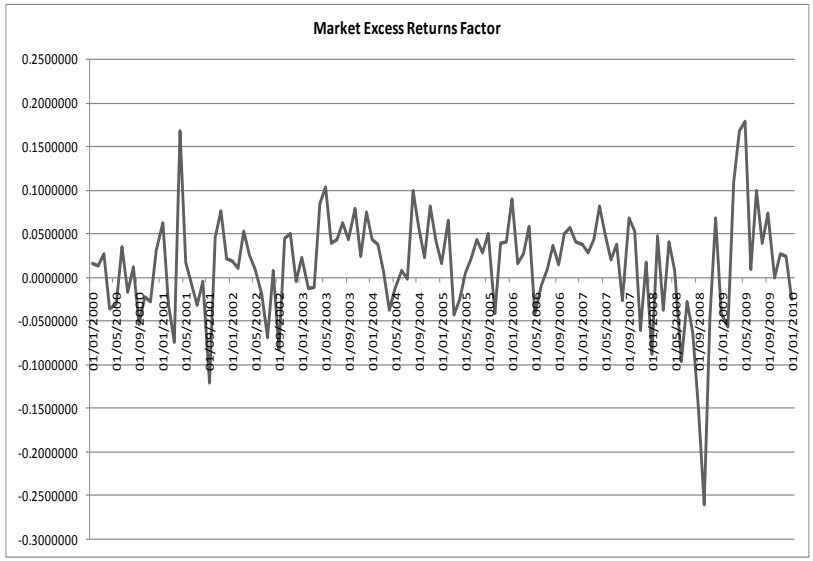


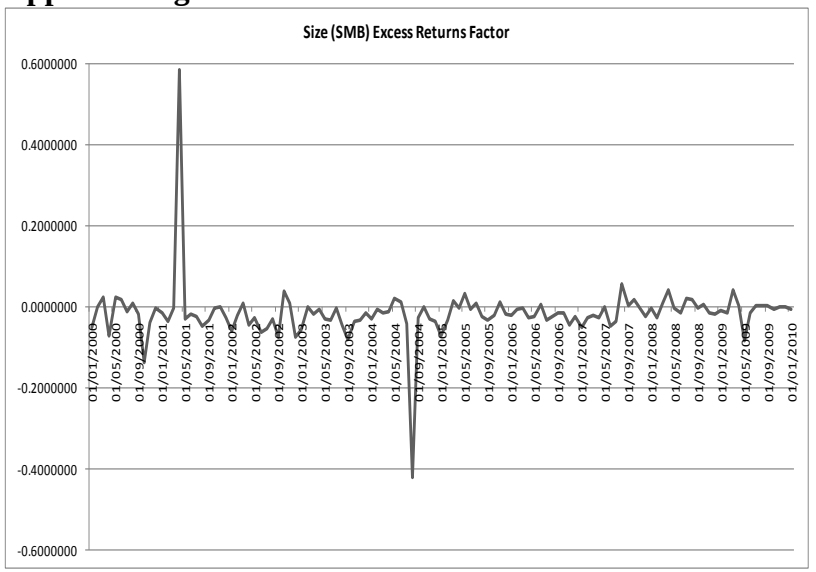
Figure 12. Time varying investor protection beta for French Civil

Figure 13. Time varying investor protection beta for German Civil

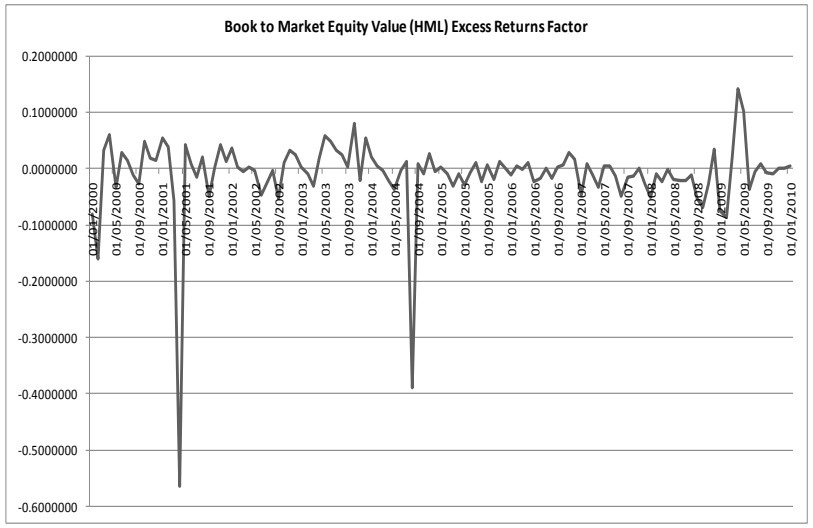
Appendix Figure 1. Market valuation factor



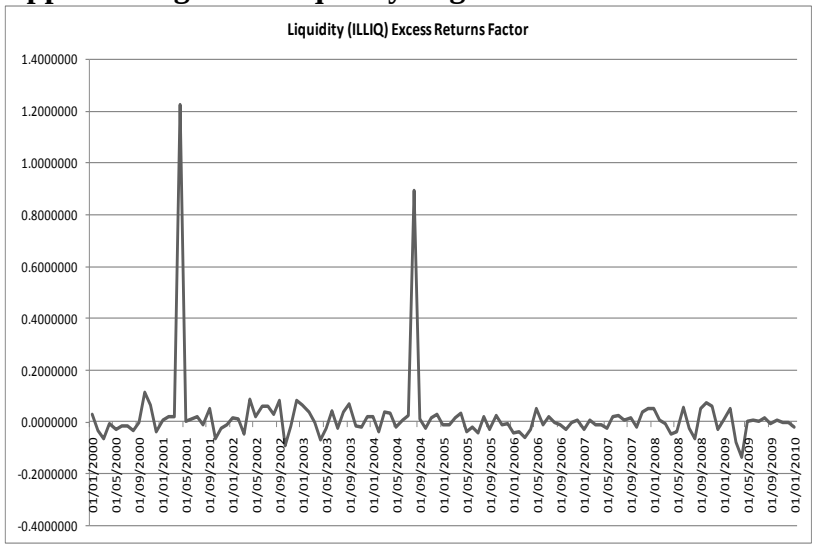
Appendix Figure 2. Size valuation factor



Appendix Figure 3. Book to Market Value valuation factor



Appendix Figure 4. Liquidity Regime valuation factor



Appendix Figure 5. Legal Regime valuation factor