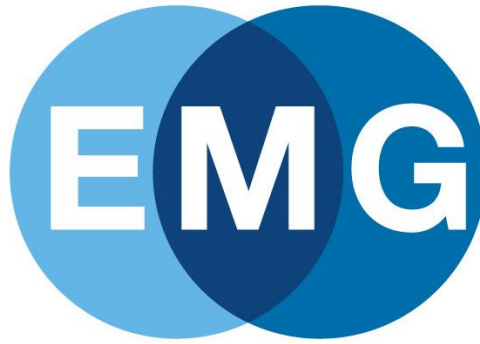




Emerging Markets Group

EMG Working Paper Series

WP-EMG-01-2019

***‘Is good governance priced? An examination of
listed firms from OECD equity markets’***

Bruce Hearn and Kate Phylaktis

February 2019

Emerging Markets Group
Cass Business School
City University
106 Bunhill Row
London
EC1Y 8TZ
UK

www.cass.city.ac.uk/emg/

Is good governance priced? An examination of listed firms from OECD equity markets

Bruce Hearn^a, Kate Phylaktis^{b,*}

^a Centre for Research in Accounting, Accountability and Governance (CRAAG), Southampton Business School, University of Southampton, Highfield, Southampton. SO17 1BJ, UK, b.a.hearn@soton.ac.uk

^b Cass Business School, City University, London 106 Bunhill Row, London EC1Y 8TZ, UK 106 Bunhill Row, London EC1Y 8TZ, UK
k.phylaktis@city.ac.uk

* Corresponding author

Abstract

A new governance index is constructed, which forms the basis of a new governance valuation factor, defined as the product of the firm governance index and the country institutional quality. Using monthly returns of 4,714 blue chip firms from 35 OECD equity markets for 17 years, our tests of variants of the augmented-CAPM, show that a two factor CAPM augmented with a factor mimicking portfolio based on our new governance metric yields the highest explanatory power in multi-country samples. We argue that this is representative of the revealed preferences of insider controlling groups within firms towards expropriating minority outsiders.

JEL classification: G3, G11, G12, G15

Keywords: Governance, Governance indices, GIM, Asset pricing

1. Introduction

Firms' adoption of costly governance provisions is motivated by the necessity to reduce minority investors' bonding costs through enhancing transparency and property rights (Jensen and Meckling, 1976). Consequently, a firm's governance structure provides a potentially useful benchmark with which to gauge the revealed preferences of insiders towards the expropriation of minorities. However, the effectiveness of any governance structure adopted by the firm is underscored by the quality of the external contracting environment and supportive institutions (Doidge, Karolyi, and Stulz, 2007). This is critical in facilitating the exchange of the firm's residual risk claims through enhancing risk diversification of minority investors (Jensen and Meckling, 1976; Fama, 1980). This leads us to ask the question whether the combination of the quality of institutional environment and firm's governance is priced by minority investors.

Variations in the governance arrangements of firms is reflective of fundamental differences in the underlying preferences of dominant insiders towards the expropriation of minorities. A Governance structure that is more dictatorship in character in engendering insider control over more dispersed democratic rights of a wider group of minority outside shareholders is reflective of residual risks beyond those envisaged in the classic mean-variance paradigm. In effect the residual risks associated with contracts are beyond those assumed as part of the neoclassical concept of welfare and agency-theoretic notion of costs. However, such preferences towards expropriation are also reflected in terms of the concentration of cash flow ownership, as documented in Hearn, Phylaktis and Piesse (2017). Both concentration of ownership and governance vary systematically from small to large firms, as well as across a wide variety of entities such as founders, families and business groups who typically accentuate control rights over cash flow entitlements (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2002). Consequently, we argue that both governance structure as well as levels of concentrated ownership, in conjunction with state-level support for external contracting, are reflective of an underlying state variable specifically relating to insider preferences for expropriation.

In an influential paper, Gompers, Ishii, and Metrick (2003) (hereinafter GIM) constructed a firm-level "G" index capturing governance provisions adopted by individual firms. These were classified as either "democracy", or "dictatorship" enhancing, where the former is associated with minority protections supporting a diversified ownership model, and the latter is associated with enhanced support for insider control rights. This was based on a total of 24 governance elements, 22 of which were drawn from the individual firms' annual reports, by-laws and charters, and the other 2 from state-level legal provisions in a dataset comprising the S&P 500 constituent firms. Bebchuck,

Cohen, and Ferrell (2009) revised these elements down to a total of 6, which were found to be statistically significant in driving performance results giving rise to what they called the “E” index. We contribute to this literature by creating a unique index of 45 governance provisions available in Thomson corporations’ ASSET4-ESG database. We follow the GIM study in designating each provision as either “democracy” or “dictatorship” in terms of the protections afforded to minority investor rights vis-à-vis dominant insiders, or controlling block owners. All provisions are collected annually from firms’ annual reports worldwide. A distinctive attribute of our new governance index is that it draws on extensive international coverage and not just availability within the US, which is a visible constraint in studies introducing firm-level governance indices such as GIM, Bebchuck, Cohen, and Ferrell (2009) and Bebchuck, Cohen, and Wang (2013).

The costs of using technologies to expropriate minority outside shareholders escalate under conditions of reduced control by insiders, a progressive adoption of governance structure emphasising more democratic rights to dispersed shareholders, and higher quality state institutions providing support and enforcement for external contracting (Doidge, Karolyi and Stulz, 2007). As such, country-level institutional quality determines the quality of protections afforded by the external contracting environment, and the additional investment benefits accruing to firms adopting more costly governance provisions in their structure. In this way, we argue that state-level institutional quality and firm-level governance are complementary – where if it were costless for firms to adopt governance provisions then all would do so, but in environments shaped by differing institutional quality, the costs and subsequent benefits accruing to firms adopting costly measures vary significantly. Thus, our new governance valuation metric takes into account the country’s institutional quality and is defined as the product of the individual firm’s governance index and the institutional quality in a country, which we capture by the equally weighted average of the six World Governance measures (see Kaufman, Kraay, and Mastruzzi, 2009). This constitutes our first contribution to the literature.

Our second contribution relates to the mean-variance theoretical framework and proposes a state variable based on the motivation of insiders in a given firm to expropriate outside minorities. This “opportunism” is almost impossible to measure directly but in a long horizon model, on balance, or in aggregate, the costs associated with expropriation by insiders will be borne by minority outside owners. This extends the intuition of the GIM study of a trading strategy based on exploiting weak (dictatorial) versus strong (democratic) governed firms to produce abnormal profits during the period 1990-1999. Similarly, Bebchuck, Cohen, and Ferrell (2009) found that their smaller “E-index” generated abnormal profits as well. We argue that governance differences are an effective proxy for expropriation tendencies by insider controlling groups and block owners, where these will impact

minority investor welfare in the long run. We propose that our new governance valuation metric formed from the cross product of the firm's individual governance index and country-level institutional quality, captures the dynamics of relative firm governance and country institutional quality as well as the complementarity between the two. We thus extend the arguments of GIM of pricing anomalies caused by governance and propose a new returns-based valuation factor to be included into a two-factor capital asset pricing model alongside the market factor. In this way, we argue against efficiency arguments put forward by Bebchuck, Cohen, and Ferrell (2013), where investors are deemed to learn governance differences in the long run, which are incorporated into trading strategies and ultimately into the efficiency of stock prices. Instead, we argue that cross sectional returns differences attributable to governance differences do not simply erode over time.

Our sample draws on the blue-chip index constituent lists of 35 OECD national equity markets, where in the case of the UK this also includes the FTSE100 (large cap stocks) as well as the FTSE250 (mid cap stocks), and in the case of the US it includes constituents of the S&P 1,500 in the form of S&P 500 (large cap stocks), S&P400 (mid cap stocks) and S&P600 (small cap stocks). This amounts to a universe of 4,714 stocks, where 2,984 of these are also included in the ASSET4-ESG governance universe. We use three universes, the aggregate OECD universe and two sub-universes formed by OECD equity markets with the US omitted and the US only universe. This latter distinction between sub-universes is important since in the US only case the distinguishing characteristic between individual firms is the governance index itself, while in the multi-country OECD with the US universe omitted, national institutional quality must also be considered.

We first show the systematic variation in the distribution of primary listings of stocks across governance-based factor mimicking portfolios (FMPs) where this conforms to the findings of La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1999, 2000) in terms of the distinction across civil versus common law jurisdictions, as well as La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1998, 2000) in terms of the geographic location of listings. Our analysis then examines whether indeed there is a governance premium between firms with high as opposed to low governance as hypothesised.

We proceed to the main part of the analysis where we contrast the new governance-based metric of investor protection over rival metrics of ownership-based investor protection, liquidity, momentum, as well as size and book to market value. The new governance metric is based on the product of national institutional quality and the governance rating of firms, where firms' governance provisions are assessed on the basis of whether they are "democratic" and enhancing minority shareholder protections, or "dictatorship" and engendering insider's control. We perform extensive tests of variants of the augmented-CAPM, and show that a two factor CAPM augmented with a FMP

based on our new governance metric yields the highest explanatory power for a cross section of stock returns.

It is also important to note that our analysis brings out the superiority of the governance FMPs in relation to asset pricing compared to the ownership-based investor protection FMPs as developed in Hearn, Phylaktis and Pierse (2017). While investor protection and governance sorting of stocks into ten deciles effectively sorts stocks based on the relative protections afforded to minority investors and hence the support for dispersed ownership model (c.f. Berle and Means, 1932), the application of asset pricing models on governance-sorted as opposed to ownership-sorted deciles captures better the shift in governance attributes of firms.

We conduct two types of robustness tests. We first relax the assumption of time invariant coefficients by applying Kalman filter time-varying parameter coefficient models and secondly, we use another proxy for national institutional quality, namely the “Legal Structure and Security of Property Rights index” of Gwartney and Lawson (2007). Our results are robust to both of these tests.

Our paper relates to two strands of literature, the construction of governance indices and governance provisions, and to the sizeable literature on asset pricing and the choice of valuation factors to explain the cross section of stock returns. We will expand on these in the next section where we develop our propositions.

The remainder of the paper is organised as follows: Section 2 focusses on the development of our governance index, its construction and association with the governance valuation metric and the development of theoretical propositions linking governance to investor welfare. Section 3 describes our data, while section 4 addresses the valuation factor construction, comparative performance and descriptive statistics. Section 5 outlines our main empirical results, while section 6 details the robustness tests. The final section concludes.

2. Governance Index

2.1 Firm-level governance index

Prior literature on the construction of governance indices can be divided into two strands: the first one is on the construction of indices capturing governance-related elements of national legal codes that apply to firms within that jurisdiction, while the second strand focuses on the variation in the individual firm’s governance structure. The first group of studies adopts survey, or questionnaire methods in codifying national legal code responses to governance clauses. This emanated from the pioneering “anti-director rights” index of La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1998),

which captured six dimensions of shareholder protection defined within prevailing national legal code statutes. These broadly cover two areas of property rights: the first three are concerned with shareholder voting, with these focussing on voting by mail and proxy, voting without the blocking of shares, and ability to call an extraordinary meeting, while the other three are related to minority protection and address proportional board representation, pre-emptive rights and judicial remedies. The dataset was drawn from 49 national legal codes as well as the ownership structure of the five largest publicly traded private (non-state) non-financial firms. More recent innovations to this included Djankov, La Porta, Lopez-de-Silanes and Schleifer (2008) “anti-self-dealing” index, constructed from questionnaire responses of 102 “Lex Mundi” law firms in 72 countries worldwide, and broken down into sub-indices representing ex-ante and ex-post private control of self-dealing. Spamann (2010) introduced a revised version of the original “anti-director rights” index, which also drew on questionnaire appraisal of national commercial codes by local lawyers as the source of primary data for a revised governance index.

The second, more firm-related strand of governance index literature, has developed from the inaugural contribution by GIM and the introduction of a governance “G” index covering a total of 24 provisions out of which 22 of these were drawn from the individual firm’s bylaws, charters, annual reports and US SEC listing filings and the other 2 drawn from state-level commercial code legal provisions. The sample here drew on constituent firms of US equity market’s S&P500 index, and the annual lists of largest corporations in the publications of Fortune, Forbes and Businessweek that were also covered in the detailed listings of corporate governance provision published by the Investor Responsibility Research Centre (IRRC). These were extracted for years 1990, 1993, 1995 and 1998 inclusive. The “G” index has been revised by Bebchuck, Cohen and Ferrell (2009) to the “E” index comprised of only 6 of the original 24 elements which were found to drive the empirical performance results.

Our new index draws from the comprehensive Thomson Reuters ASSET4-ESG database of governance attributes of individual listed firms worldwide (see Thomson Reuters ESG Scores, 2017).¹ This was fully integrated into the Thomson Datastream platform in 2009 along with backdated data to 2002, the year of its inception. In this way, it is seamlessly integrated with trading data which are typically associated more with the formation of valuation factors used in asset pricing models. ASSET4-ESG uses data drawn from the individual listed firm’s annual reports to populate three distinct categories of organizational structure: (1) environmental, (2) social and (3) *governance*. The

¹ Thomson Reuters ESG Scores, 2017 refers to full overview of ESG scores and definition of structural elements and parameters – sourced from website <https://developers.thomsonreuters.com/content/environmental-social-and-corporate-governance-esg>

governance, category encompasses structural parameters relating to three thematic sub-categories, namely (a) *management*, (b) *shareholders* and (c) Corporate Social Responsibility (CSR) strategy. Our new governance index is comprised solely from the elements drawn from the third category, namely *governance*, and specifically the thematic dimensions of (a) *management*, and (b) *shareholders*, which form the core of the governance theme of ASSET4-ESG database and omits the CSR attributes of firms.

At this stage it is worth noting two points. First, despite the unique and extensive coverage of the ASSET4-ESG database, since its inception in 2002, the overwhelming majority of coverage was limited to the largest blue-chip firms in the US, Western European and Swiss equity markets. Subsequently, its coverage expanded and as a result, there are annual significant jumps in the coverage with one of the largest jumps taking place during the period 2007-2009. However, even by September 2017 the coverage of emerging economies was minimal where this is exemplified by approximately 170 Chinese and 100 Indian firms. This largely justifies our focus on a sample of constituent firms from the OECD equity markets as opposed to the much broader sample of MSCI world equity markets. The second point to note is that the individual structural and/or governance elements vary considerably from firm to firm. Consequently, while there are almost 300 structural and governance elements per firm included in the ASSET4-ESG database, there is marked variability in the current maintained data availability across constituent firms. As such this further reduces the sample to 86 structural-related attributes that are consistently maintained and populated with data. However, of these only 45 are strictly focussed on “governance” elements, which are coded as “Yes”/ “No” or “Y/N” responses, as opposed to various numerical values. Thus, our final sample is comprised of 45 binary elements covering the firm’s governance structure.

These are outlined in Table 1 where they are further subdivided into four thematic groups, minority rights, voting, delay, and director incentives. The minority rights group includes 16 provisions relating to underlying board of directors’ composition as well as the individual director liability. The former addresses issues relating to minority property rights in terms of representation on board and the selection or nomination of directors to board as well as their ability to provide effective monitoring and surveillance over corporate affairs and executive decision-making. The latter focusses on entrenchment issues and legal liability of individual directors in relation to their decisions and breaches of fiduciary responsibility while in office. The voting group is comprised of 16 provisions relating to the protection of minority shareholder voting rights. These focus on the centrality of one-share one-vote as opposed to different classes of share and infringements of control rights in relation to cash flow entitlements, confidentiality of voting and ability to vote by proxy and motions, such as

supermajority and written consent. The delay group includes 6 provisions designed to slow down a hostile takeover. The market for corporate control is the ultimate disciplinary recourse in the Jensen and Meckling (1976) agency-theoretic view of the firm. These six provisions relate to significant reforms to director tenure inhibiting potential changes following a takeover, as well as the firm's ownership control structure being enmeshed within extensive cross-shareholding networks – such as Japanese keiretsu or business groups. It also covers golden shares with preferential “veto” rights, and unlimited restriction on authorized capital of firm where incumbent insiders effectively have a blank check with which to fight off hostile bidders' accumulation of voting shares. Finally, the director incentives group includes 7 provisions relating to shareholders having uninhibited say on insider director's self-reward tendencies in the form of compensation structure and levels of pay. It also addresses the effectiveness of compensation committee and compensation policy design.²

Collectively the four thematic groups containing the 45 governance provisions reflect the internal monitoring and incentive structures used to align controlling insider interests with those of minority outsider shareholder owners. However, they also capture the ultimate disciplinary function of the market for corporate control which externally reinforces the governance system through constant evaluation of incumbent firms.

Table 1

The formation of the new governance index adopts an equally weighted sum of all 45 governance elements. Each element that is coded as a “Yes”/ “No” or “Y/N” response is then binary coded with value 1 for those elements enhancing democracy governance and 0 otherwise, and in the cases of those elements enhancing dictatorship governance a value of 0 for those “Y” values and value of 1 for corresponding “N” values. Missing values are omitted from being coded as either 1, or 0 and thereby not included in the resulting index. It should be noted that while we include more governance elements than the G-Index, these are included on the basis of availability in the ASSET4-ESG database. This construction follows that of the GIM study in attributing the binary value of 1 to governance elements deemed to enhance minority shareholder rights which are termed as “democracy” elements as opposed to those that detract from these and empower incumbent insider groups and block owners, where these in turn are termed “dictatorship” elements. However, a distinctive attribute of our new governance index is that it draws on extensive international coverage and not just availability within the US, which is a visible constraint in studies introducing firm-level governance indices such as GIM, Bebchuck, Cohen, and Ferrell (2009) and Bebchuck, Cohen, and Wang (2013).

² For more information on the definition of Asset 4-ESG governance elements look at Appendix B, Table 1B.

We construct an annual time series of the new firm-level index, where index values are re-evaluated annually alongside the annual frequency of updating of all elements in ASSET4-ESG universe. However, we adopt the forward-fill method used by both GIM and Bebchuck, Cohen, and Ferrell (2009) and Bebchuck, Cohen, and Wang (2013). The latter studies carry forward the individual firm index values from the last reported date of 2016 into 2017. Mindful of the inception of ASSET4-ESG in 2002 and we also adopt a variant of this and assume those index values prevalent in 2002 are unchanged going backwards for preceding years 2001 and 2000. This is justified owing to the relative rigidity of firm-level governance changes over short periods of time, such as up to 2 years. Importantly it facilitates the comparison between the governance-related portfolios and valuation factor with all other factors estimated over the full length of the sample period.

The percentage proportion of firms adopting each of the 45 governance provisions that form the basis of our index in year 2015 is reported in Table 2. This draws on sub-samples of our overall OECD sample of 3,244 firms constituent to 35 national blue-chip stock exchange indices (see Appendix A, Table 1A), where 1,912 are also covered in ASSET4-ESG governance dataset for the year 2015. We break this down in order to compare governance attributes of firms' constituent to the large, mid and small cap US indices – namely S&P500, S&P400 and S&P600, and then contrast firms with their primary listing locations falling between civil code law as opposed to common law jurisdictions. Differences between civil code and common law jurisdiction firms are immediately obvious with “democracy” governance provisions generally being markedly more prominent in the latter legal regime as opposed to the former. This is exemplified by board diversity policy, where over 77% of common law firms report adherence as compared to just over 25% of civil code law firms. This pattern is repeated across all governance elements between the two legal systems underscoring the differences in the protection of minority investor property rights afforded by each system. This evidence is very similar to that documented in La Porta et al (1998, 2000) which contrasted differences between civil code and common law in terms of national legal governance code provisions. Finally, a clear distinction is visible across US blue chip indices from S&P 500 through S&P 400 to the small cap S&P 600. This last category of firms has the weakest governance protections in terms of the adoption of democratic governance attributes. This is anticipated on the basis of smaller, less well capitalized SME firms in S&P 600 index being less able to afford the adoption of costly governance provisions in contrast to their better capitalized and larger blue-chip counterparts in S&P 500. It also signals a clear association between firm size, governance structure and the importance of external finance as originally highlighted in La Porta, Lopez-de-Silanes, Schliefer, and Vishny (2000).

Table 2

2.2 Governance metric

The governance metric is the result of the multiplication of the underlying individual firm governance index and country-level institutional quality. This is beneficial in its simplicity – where a tie-breaker is given in sorting stocks that are well-governed but can be distinguished in the relative protection afforded to minority shareholders by prevailing national legal and dispute-resolution systems. The governance measure is defined as:

$$Governance_{ijt} = (Institutional\ quality_{jt}) * (Firm\ governance\ index_{ijt}) \quad (1)$$

for country j , firm i at year t . The Firm governance Index is the yearly index value for each listed firm i in country j .

Institutional quality for each country is formed from the average of the six World Bank governance indicators: control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law and democratic voice, and accountability (Kaufman, Kraay, and Mastruzzi (2009)).³ These indicators range from -2.5 to +2.5 but here have been rescaled to take a value between 0 – 10. Country j refers to the primary listing location of firm i . We adopt the country of primary listing as opposed to the country of incorporation on the basis of the “legal bonding hypothesis” of Coffee (1999, 2002). Firms incorporated in an overseas jurisdiction adopt or “legally bond” to the governance arrangements of the country of their primary listing. The governance indicators were first reported in 1996 and were updated at two yearly intervals until 2002, after which they were produced annually. In the early years of the series, the indicators in the intermediate year were assumed to be the same as in the preceding one, given the relatively slow nature of institutional change (Williamson, 2000, 2002; North, 1991, 1994). It is important to state that we assume the complementarity of firm-level governance attributes and national institutional quality as opposed to them being substitutes as noted by Klapper and Love (2004) and Chen, Chen and Wei (2009). The complementarity assumption has far reaching implications – where national institutions are deemed essential to support deep capital markets through their facilitation of external third-party contracting, which enables firms to take advantage of these sources of external funds through their adoption of governance. This mitigates minority investor adverse selection through being better able to gauge relative quality of investment opportunities in residual risk claims, as well as

³ The six indicators are recalculated and updated every two years and were calculated back to 1999. Source: <http://info.worldbank.org/governance/wgi/index.asp>. See Appendix B Table 1B for definitions.

recourse to effective institutional sanctions acting as a deterrent to deviations in moral hazard following investment.

2.3 Relationship between institutions and firm governance

The theoretical basis for our proposition of minority investor welfare differences in relation to governance are based on the premise that differences in the governance structure of firms yield pervasive pricing anomalies in the long run equilibrium of the economy that cannot be simply arbitrated away given they fundamentally relate, or proxy an underlying state variable.

While classical efficient market theory (e.g. Fama, 1970) questions whether public information can ever be used to produce abnormal returns, adaptive efficient market theory (e.g. Daniel and Titman, 1999) suggests the ability of any trading strategy based on public information to generate risk-adjusted abnormal profits, which will dissipate over time. Developing from this basis, Bebchuck, Cohen, and Wang, (2013) argue that market traders effectively “learn” the differences between good and bad governance and incorporate these into arbitrage order flow that adjusts prices in equilibrium. However, these approaches are centred on the notion of rationality in the form of expectations and related behaviours. In contrast, we argue that investors are not fully rational, where this is exemplified in the documented “home bias” in equity portfolio investment based on trading strategies, which encompass markets and listed firms that are institutionally compatible with the investor’s home equity market. This institutional shaping of investor preferences incorporates greater degree of persistence in differing reactions towards differences in governance than is otherwise assumed by Schleifer and Vishny’s (1997) “limited arbitrage”, which argues that information is slowly incorporated into traded prices over longer time horizons.

Our theoretical model assumes perfectly integrated asset markets that are subject to mild segmentation reflective of differences in corporate control. This extends the restricted CAPM model of Errunza and Losq (1985) and Merton (1987) and follows the intuition developed in Heinkel, Krauss, and Zechner, (2001) in considering the asset pricing implications arising from a subset of investors emerging from within a given universe. Further, we assume that at any given time there is a finite number of listed firms and a finite pool of investors. Following Giannetti and Koskinen (2010), two categories of investors are considered: minority portfolio investors and controlling shareholders. This leads to an assumption of a natural difference arising between the governance structure of any given firm – where this is either dictatorship, or democracy orientated. The former acts to empower insider groups and controlling shareholders, while the latter empowers dispersed minority outside investors. Following La Porta, Lopez-de-Silanes, Schliefer, and Vishny (2000) and Giannetti and Koskinen

(2010), we argue that there are two payoffs arising from shares. The first is attributable to all security holders in the form of dividends and capital gains, while the second grants preferential access to private benefits that accrue only to controlling block shareholders.

Thus, firms with dictatorship governance structures are attractive solely to controlling shareholders who compete to acquire full control of the firms through large block shareholdings. Conversely, firms with democratic governance structures have widely dispersed investor bases with few, if any, block holdings. We argue that national institutional quality is complementary to firm governance structure as it supports external capital markets for residual risk claims – but in turn these are representative of the market for corporate control. This is supported by Klapper and Love (2004), who find that the average firm level governance is lower in countries with weaker legal systems. Therefore, governance within the firm is correlated with contractual imperfections and levels of asymmetric information in their national environment. We also follow North (1991, 1994), who claims that the institutional development within a given society, or country, is a function of the continuous interaction between the firm transactions, the ruling polity and the wider population and this acts as a check, or balance to the moral authority of the state. In this way the internal governance of the firm is inextricably linked to the external institutional quality by the nature of the political economy.

As noted above, at the centre of our model is the assumption of perfectly integrated capital markets that are mildly segmented by restrictions in corporate control. Thus, controlling shareholders exert their control through larger block ownership holdings in firms with weak governance (and more dictatorial in nature) - situations that also exhibit greater information asymmetry. Here, the expropriation of private benefits motivates their participation as these augment otherwise low risk-adjusted returns associated with such dictatorially-governed firms.

Our model focusses on the welfare implications for minority portfolio investors arising from the need to diversify by optimising portfolios that draw on a wide cross section of stocks from weak (dictatorship) to strong (democracy) governed firms. Given the mild segmentation assumption, arbitrage trading to close price differentials is impeded, reflecting the laws of supply and demand (Errunza and Losq, 1985; Heinkel, Krauss, and Zechner, 2001). In this way, more dictatorial governed stocks attract controlling shareholders due to the relative ease of extraction of private benefits in an environment of informational asymmetry and opacity in financial reporting and governance practices. Such controlling shareholders dominate ownership of firms through large block holdings and consequently minimal free floats are available for minority portfolio investors. However, the limited supply is offset by a lack of demand by minority portfolio investors given that they face the risk of expropriation. Thus, the stock price decreases in equilibrium to reflect the risks associated with

informational asymmetry and increased expropriation risk. Therefore, minority portfolio investors demand higher expected returns to compensate for this lower price and this is reflected in a positive premium. Conversely, in firms operating in an environment with high institutional quality, the ownership base is formed from widely dispersed minority portfolio investors and an absence of controlling blocks. The absence of controlling block shareholders implies a reduction in entrenchment and expropriation risk, while higher institutional quality implies greater protection of property rights for minority investors. Thus, the demand for these shares is greater and the price is driven up. The enhanced price is a reflection of a discount because of the lower risk and therefore expected return.

Our model considers a continuum of investor protection, ranging from weak to strong, following Giannetti and Koskinen (2010). However, we implicitly consider a notional *average* level where minority investors expect a premium when participating in dictatorship-orientated governed stocks and a discount when participating in their democratically-governed counterparts. These differences lead us to anticipate a persistent difference in the cross section of stock returns, attributable to institutional quality and governance structure.

Despite the evidence in the literature relating to the formation of governance indices, such as the “G-index” in GIM, the or “E-index” in Bebchuck, Cohen, and Ferrell, (2009), and their linkage with abnormal profits associated with governance-based trading strategies exploiting differences between weak and strongly governed firms, this has not been extended into a formal asset pricing framework. The GIM study,⁴ is seminal in as much as it created a governance index and used state- and firm-level governance to rank a universe of US firms into decile portfolios ranging from the weakest governance, or *dictatorship* portfolio, to the strongest, or *democracy* portfolio. The market universe is taken from the Investor Responsibility Research Centre (IRRC) and includes approximately 1,500 stocks, which account for over 93% of capitalization of the New York stock exchange (NYSE), the American stock exchange (AMEX) and NASDAQ. These ten governance-ranked decile portfolios were used in an application of the Carhart et al (1997) four factor augmented-CAPM pricing model. This is the standard CAPM augmented by size and book-to-market factors (Fama and French, 1993) plus the momentum factor. Un-priced premiums, the alphas, were found across all deciles, and those associated with the lowest and the highest governance quality deciles were statistically significant. The application of the Carhart (1997) four factor model to a zero-cost portfolio, which reflects a structure of buying firms in the weakest governance category and selling in the highest, resulted in annualized

⁴ Albuquerque and Wang (2008) develop a dynamic stochastic general equilibrium model to study the association between asset pricing and the welfare implications of imperfect investor protection. They find that countries with weaker investor protection attract larger risk premia, greater return volatility, lower Tobin’s q and higher interest rates. This is in line with our theoretical model.

abnormal returns of 8.5%. The GIM study also found that firms with the stronger shareholder rights had higher value, higher profits, higher sales growth and lower capital expenditures, which are all consistent with La Porta, Lopez-de-Silanes, Schliefer, and Vishny (2000, 2002). A follow up to this study was that undertaken by Bebchuck, Cohen, and Ferrell, (2009) whose findings revealed that six out of the 24 governance provisions used in GIM drove the earlier results. However, despite finding evidence of a premium, no asset pricing application was proposed. This literature forms the basis of our first proposition:

Proposition 1: *Welfare losses arising from diversification between weak (dictatorship) and strong (democracy) governed firms are reflected in a premium*

Focussing on the presence of a state variable based on revealed preferences of insiders towards the expropriation of minorities, we argue that both the new governance metric and the investor protection measure of Hearn, Phylaktis and Piesse (2017) are in effect capturing different aspects of the same underlying phenomenon. As such, variations from the diversified ownership model of Berle and Means (1932) as well as variations from democracy-orientated governance, which underpin the new governance metric, are representative of significant departures from the rigid assumptions behind the capital asset pricing framework. The greater the concentration of cash flow ownership in the investor protection metric of Hearn, Phylaktis and Piesse (2017) represents a significant departure from Berle and Means (1932) diversified ownership model. It also represents a significant concentration of control rights in the hands of insiders, and consequently a significant departure in the levels of residual risks embodied in equity contracts from those envisaged in the mean-variance framework. This is particularly prevalent in smaller firms and those dominated by families, founders and business group conglomerate interests. These all are known to employ mechanisms effecting the separation of ownership from control based on pyramids, cross shareholding networks, socialization (such as group wide training and director interlocks) as well as principal-principal interactions, where one group such as family has members spanning both insiders and outside owner roles.

Firms adopting governance structures, which emphasise more democratic protection of minority rights, focus on reducing the control of insiders vis-a-vis minorities. Correspondingly, those that adopt more dictatorship orientated governance structures emphasise the accentuated control of insiders against minority owners. This transition from insider domination, as reflected in elevated cash flow ownership, and dictatorship-orientated governance, to optimal protection of outside minority rights, through adoption of diversified ownership and democratic-orientated governance, is also

representative of systematic variation in bonding costs. Ultimately insiders, typically owners, are responsible for decision-making regarding the adoption of governance elements that shape the structure of the firm. Thus, ownership and governance are likely to be linked strongly. These in turn proxy the preferences towards expropriation of minorities of insiders, in terms of facing a trade-off to reduce bonding costs and attract lower discount rates, or to invest in ever more sophisticated expropriation technologies and inhibit the adoption of governance apparatus that can be used to protect and enforce minority property rights, leading to higher discount rates. Given these theoretical arguments of equivalence between investor protection and governance we propose the following:

Proposition 2: Governance is equivalent to Investor Protection (based on dispersed ownership) and is robust in capturing the cross section of stock returns

To test the above propositions, we undertake a number of procedures. First, we disaggregate the OECD overall universe into two components: an OECD excluding the US universe and the US as a single country. The selection of the US only universe is based on it being comprised by the large S&P1,500 constituents which are universally covered in ASSET4-ESG database and the importance of including a single equity market where national institutional quality becomes superfluous and firms are solely ranked in accordance to their firm-level governance index. The OECD excluding the US universe facilitates the comparison across an heterogeneous multi-country mix of national institutional regimes based on either civil code law variants, or common law, while omitting the single largest common law market, namely the US. There are also notable differences in the control structure, where cross-shareholding networks are virtually absent and family ownership is minimal in the US case, while both are prominent across the rest of the OECD member states. Notably in the US a far greater proportion of firms adhere to dispersed ownership model than in the OECD counterparts. This distinction based on universe classification facilitates tests of the above propositions and provides an additional context for the asset pricing models.

Secondly, we test our new governance metric by formulating a returns-based factor in a simple two-factor augmented CAPM framework (Governance 2F) and compare its performance with FF3F, Carhart 4F (including momentum), Liquidity (Liquidity 2F), and Investor Protection (Investor Protection 2F)-augmented two-factor models for each of the three universes. We also compare monthly-rebalancing and annual-rebalancing factor portfolio construction techniques with different valuation factors. Additionally, we relax the time invariant parameter assumptions of the traditional CAPM framework and adopt the Kalman filter approach to Governance 2F, the FF3F, Carhart 4F

(including momentum), Liquidity 2F, and Investor Protection 2F models and compare the performance of each. Finally, for each universe we compare the application of our Governance-augmented CAPM in explaining returns across ten governance-sorted decile portfolios and then across ten Investor Protection sorted decile portfolios. This yields a robust method of evaluating factor performance in explaining the cross section of stock returns.

We test the robustness of our results by using an alternative proxy for institutional quality, the “Legal Structure and Security of Property Rights Index” developed by Gwartney and Lawson (2007), which focusses on the legal security of property rights for minorities. Our results are on the whole robust.

3. Data and summary statistics

3.1 Sample selection

Our sample is constructed in two stages. The first sorts all markets within the OECD⁵ and uses La Porta, Lopez-de-Silanes, Schliefer, and Vishny (2000)’s distinction between those with national jurisdictions that are either common law, or civil code law. The second selects stock-level data from the major blue-chip index constituent lists in Datastream (see Appendix A, Table 1A). This criterion ensures they conform to international investors’ selection requirements in terms of marketability and accessibility (foreign ownership restrictions). It also avoids the problem of selection bias that can arise from pre-determined minimum price criteria, as found in Hou, Karolyi, and Kho (2011). The blue-chip index constituent stocks also conform to international asset diversification assumptions regarding inter-market asset market integration that is essential to the CAPM, and thus avoids intra-market segmentation prevalent in emerging stock markets.

The data are from January 2000 to September 2017, although ASSET4-ESG data is only available from January 2001 onwards. This is relatively short but reflects the period for which governance data was compiled by ASSET4-ESG. The data includes single class ordinary shares only and excludes preference shares, dual class shares, warrants, convertibles, REITs, closed-end funds, exchange traded funds and depository receipts. Finally, where any return above 300% that is reversed within one month is treated as *missing*, that is, if R_t or R_{t-1} is greater than 300%, and $(1 + R_t) * (1 + R_{t-1}) - 1 < 50\%$, then both R_t and R_{t-1} are set to *missing*. This follows Ince and Porter (2003).

Following Hou, Karolyi, and Kho (2011), we ensure accounting ratios are known before returns and thus match the end of year financial statement data for year $t-1$ with monthly returns from July of year t to June of year $t + 1$. We use the inverse of the market-to-book-ratio (see Appendix B,

⁵ OECD members are from: <http://www.oecd.org/about/membersandpartners/list-oecd-member-countries.htm>

Table 1B) to calculate the Book to Market Value ratios. In addition, size is defined as the market value of equity at the end of June of year t , while momentum (Mom) for month t is the cumulative return from month $t - 6$ to month $t - 2$, skipping month $t - 1$ to avoid microstructure biases such as bid-ask bounce or non-synchronous trading.

The final sample consists of 4,714 common stocks from the 35 OECD equity markets blue chip indices. However, 2,984 common stocks are covered by the ASSET4-ESG database in terms of governance data availability. Our sample comprises the S&P 1,500 index constituents for US only, alongside a total of 3,214 stocks across the remainder of OECD. Figure 1 shows the distribution of the sample over period January 2000 to September 2017. US stocks contribute 34% of the total OECD universe, while Canada contributes 5%, UK 7%, and Australia and New Zealand jointly also 7%, Japan 12%, Scandinavia 9% and Western Europe 16%. The rest are from Eastern Europe, Middle East and Latin America. Figures 2 and 3 reveal the development of the sample over time – with the former showing the overall sample, while the latter shows the ASSET4-ESG constituent sample. It is immediately obvious that the ASSET4-ESG coverage has greatly increased since 2002 and that increases occur in distinct annual “step increases” reflecting the frequency of reporting of governance parameters from published annual reports and increased coverage of listed firms across sample markets.

Figures 1, 2 and 3

3.3 Summary statistics

Table 3 reports the summary statistics for the new firm governance metric, its underlying firm governance index and country-level institutional quality, alongside a comparison of the investor protection metric, identified by Hearn, Phylaktis and Piesse (2017) and its constituent components, the percentage proportion of free float and country-level institutional quality. The last three columns report market capitalization (in US\$), accounting book to market value ratio and the liquidity metric of Liu (2006). The 35 OECD countries are grouped into regional categories with Europe being divided into developed and emerging using the MSCI classification system. Finally, using the definition by La Porta, Lopez-de-Silanes, Schliefer, and Vishny (2000), countries are classified into civil code as opposed to common law jurisdictions.

A number of observations can be noted. First, English common law nations are associated with higher institutional quality compared to the majority of civil code countries, reflecting the work of La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1999, 2000). Second, there is considerable variation in

the governance metric with this being the highest for the US S&P 500 constituent firms and the lowest for the Mexican and Turkish blue-chip index constituent firms. However, it is the highest for the common law countries of US (2,242 for S&P 500, 2,193 for S&P 400, and 2,117 for S&P 600), Canada (2,174), UK (2,206 for FTSE 100 and 2,014 for FTSE 250), Ireland (2,119), Australia (2,164) and New Zealand (2,067), as well as for the civil code law Netherlands (2,145). In contrast, it is the lowest for Latin America with Mexico (645) and Chile (1,015), Middle East with Turkey (757) and Israel (1,192) and Asia with Japan (1,011) and South Korea (803). However, the low values of these last two Asian countries are in contrast to their rankings under the investor protection measure where both rate very highly. We argue that the new governance measure captures the underlying differences in the cultural aptitude of firms towards adopting democratically orientated governance provisions. This is particularly true in Japan and South Korea, where there are extensive cross-shareholding networks, such as keiretsu and chaebol structures, and national culture is based on communitarian, or communalistic norms as opposed to more individualistic norms, which are present in European and North American cultures. This is indicative of a propensity towards extended relational contracting as opposed to external contracting that is typical in European and North American countries. The new governance metric captures this deeper cultural phenomenon reflected in firms' decision on the selection of their governance structure. Thirdly, the mean firm size is generally higher in the US, Canada and Western Europe than other world regions. This ranges from US\$ 16.55 billion in US S&P500 firms, US\$ 25.89 billion in UK FTSE100 firms, US\$ 187.62 billion in Ireland and US\$ 112.51 billion in Netherlands to US\$ 0.29 billion in Iceland and US\$ 0.14 billion in Estonia. It is notable that there is a markedly lower variation in book to market value across the sample. However, there is considerable variation in illiquidity levels, measured by Liu (2006) metric, with these being noticeably higher in the less developed equity markets of Eastern Europe and Scandinavia.

Table 3

4 Factors driving returns

4.1 The construction of Factor Mimicking Portfolios (FMPs)

The governance FMP is formed from first ranking stocks by their annual governance metric. Following a similar procedure as in Liu (2006), these are sorted into 10 decile portfolios with the FMPs formed from the returns difference between high and low governance decile portfolios. Annual rebalancing is undertaken in December of each year, following Fama and French (1993), with an annual holding period. This annual frequency is used in line with both governance and institutional quality being measured annually. Higher governance deciles reflect firms strategically adopting

democracy-enhancing governance provisions that facilitate external contracting and lower bonding costs otherwise incurred by minority outside investors. This captures both firms in high quality institutional environments that are typically common law jurisdictions, as well as firms in low quality institutional jurisdictions that voluntarily adopt more democratic governance elements in order to competitively attract more portfolio investment. In this way the new governance measure captures the strategic intentions of the firm in terms of the degree of adoption of external democratic governance tenets. This is based on the relative importance to individual firms of reducing bonding costs incurred by minority investors.

In terms of the comparator factors and we first consider the investor protection (Hearn Phylaktis and Piesse, 2017) and liquidity (Liu, 2006) FMPs, where these are both formed using similar procedure to that outlined above for governance. However, in both, we also included additional monthly rebalancing using metrics estimated over a preceding month, followed by monthly holding periods. These were rebalanced monthly with the FMPs returns formed from the averages across each of twelve annually held liquidity FMPs, similar to the method used for the momentum portfolio in Jegadeesh and Titman (1993).⁶ These have been used as an additional robustness check.

The size and book-to-market FMPs of Fama and French (1993) are formed from a 5 by 5 two-step sorting procedure. The first step involves the sorting of stocks into five quintile portfolios based on size, or market capitalization, in June of each year. The second step involves the further sorting of stocks constituent to each of the first five quintile portfolios into a further five quintile portfolios based on their individual book-to-market values. This leads to a total of 25 size and book-to-market value sorted portfolios. FMPs relating to size are created from average returns on small size portfolios minus those on big size portfolios (SMB factor) and similarly with high book to market value portfolios minus low book to market portfolios (HML factor). SMB and HML factors are formed from value-weighted returns.

The momentum FMPs use ten decile portfolios, with stocks ranked on momentum across portfolios, where momentum is defined as the cumulative return over the preceding six months. This follows the procedure outlined in Jegadeesh and Titman (1993), namely a six-month/six-month strategy, where monthly returns are an equally weighted average of six individual strategies of buying the winning decile portfolio and selling the losing decile portfolio. Rebalancing occurs monthly.⁷ In

⁶ That is, this liquidity FMP return for January 2005 is formed from 1/12 of the return spread between high liquidity ranked stocks and low liquidity ranked stocks for January 2003 - January 2004, 1/12 of return spread between high and low liquidity stocks for February 2003 through February 2004, etc.

⁷ That is, the momentum FMP return for January 2001 is 1/6 of the return spread between the winners and losers from July – November 2000, 1/6 of the return spread between winners and losers from June – October 2000, etc.

order to minimize the bid-ask bounce effect, we skip one month between ranking and holding periods when constructing the momentum FMP. This FMP is formed from equal-weighted returns.

Finally we form market portfolios based on both equal and value weighted returns of all stocks within a universe at a given time and use the yield on the 10 year US Treasury bill as our risk free rate. We use the time-series regressions of Black, Jensen and Scholes (1972), following Fama and French (1993) where the excess returns on test portfolios are regressed on the returns of FMPs. The time series slopes are interpreted as factor loadings that inform how various combinations of these FMPs explain the average returns across the portfolios.

4.2 Descriptive statistics of FMPs

Table 4 reports the means, standard deviations, autocorrelations and cross-correlations of monthly returns of the FMPs for the Aggregate OECD universe only due to brevity. Results for OECD excluding the US, and US only universes are available from authors upon request. The market portfolio has an average excess return of 1.12% over the 201-month horizon in the Aggregate OECD universe (panel 1) which is statistically significant (t stat 3.23). We select the equal-weighted market portfolio. This has an approximately normal distribution, according to the Jarque-Bera statistic rather than the value-weighted market portfolios, which are highly non-normal. The difference in distribution between these two returns series is also reflected in the levels of kurtosis and skewness. These results are not reported but are available from the authors upon request.

FMPs relating to size (SMB) and liquidity also have large mean returns that are equally statistically significant (panel 1). Mean returns on SMB are 1.86% (t stat 7.33). In the case of liquidity and mean returns are -1.13% (t stat -4.56). SMB has low kurtosis, skewness and largely conforms to normal probability distribution. However, this is in contrast to liquidity and investor protection, where Jarque-Bera statistics reveal substantial non-normality in returns.

It is worth noting that of all the FMPs, those attributable to HML and Momentum are the smallest in average returns –under 0.50%. This implies that while HML and Momentum are relevant in explaining the cross section of stock returns in the US (e.g. Jagadeesh and Titman, 1993, 2001), they are less useful in other equity markets worldwide and particularly in broader multi-country universes. This implies that if premiums do exist for each of these factors they are likely to be smaller in absolute size.

Finally, and the FMPs associated with investor protection and the new governance measure are generally small in terms of average returns –under 0.50%, while the governance FMPs returns are statistically significant across all three universes and the investor protection is only significant in the

Aggregate OECD and US universes. Finally, it should be noted that the governance FMPs mean returns conform to normality the most of any of our FMPs in terms of skewness, kurtosis and Jarque-Bera statistics across all three universes.

It should be noted that we have not reported the monthly rebalancing FMP results for brevity, although these are available from the authors upon request. Monthly rebalanced FMPs for liquidity and investor protection are highly correlated with their annually rebalanced counterparts leading to our omission of these monthly liquidity and investor protection FMPs. Therefore, the factors included in the time series asset pricing tests are the equally weighted market excess returns, the value-weighted size and book-to-market FMPs, the equal-weighted momentum FMP, and the annually-rebalanced equal-weighted liquidity and investor protection FMPs.

In terms of correlations (panel 2) it can be observed that correlations are low (under 0.50) in absolute value between all FMPs and the FMPs and market portfolio. However, it is notable that despite the correlations being low in absolute size, they are statistically significant amongst the market portfolio SMB, HML, liquidity and momentum FMPs – while this significance is largely lacking between both the investor protection and governance FMPs and any of the others. Finally, concerns regarding autocorrelations are mitigated due to their low absolute size and negligible statistical significance over 1, 6, and 12 month lagged periods (panel 3).

Table 4

4.3 Descriptive Statistics of Governance Portfolios

Table 5, panel 1 reports the characteristics of the stocks for the Aggregate OECD universe in each of the ten decile governance portfolios with respect to geographical region and legal origin. It shows clear trends across all decile portfolios in terms of the country of primary listing. In common with La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1998, 2000) we find that the highest governance deciles are dominated by stocks from English common law markets, while the lowest are dominated by German, and to a lesser extent French, civil code stocks. The propensity of German civil code law stocks in the lowest governance deciles is largely due to Japanese and South Korean stocks, which have minimal democratic governance structure, where these stocks form sizeable proportions of our sample. Unlike La Porta, Lopez-de-Silanes, Schliefer, and Vishny (1998), we find that the Scandinavian civil code stocks are more closely associated with the English common law stocks and exhibit an increasing trend towards higher governance deciles. This suggests a similar level of minority investor protection in Scandinavian civil code and English common law countries.

When we separate stocks by regional location of their primary listing venue, these trends are accentuated. Stocks from Australia and North America populate overwhelmingly the highest governance deciles (D5 to D10) with minimal, if any, participation in the lower governance deciles (D1 to D4). Developed Europe and Scandinavian stocks are more evenly distributed across all governance deciles – although there is a notably an increasing trend towards higher governance deciles. Conversely stocks drawn from Asia, notably Japan and South Korea, are almost universally located in the lowest governance deciles, (D1-D4). This unexpected finding further underscores a marked departure from their comparatively high ranking in terms of investor protection metric and in particular their levels of free float capitalization. Finally, stocks drawn from Latin America, Emerging Europe and the Middle East are almost all universally located in the lowest deciles, which is largely an anticipated result owing to the weaker institutional environments in these regions and minimal minority investor protection.

In Table 5, panel 2 we separate stocks in the US only universe across the three sub-components of the S&P 1,500 US equity market index – namely large cap S&P 500, mid cap S&P 400 and small cap S&P 600. There is a clear upward trend in stocks constituent to S&P 500 blue chip index in the highest governance deciles, while there is an increasing trend in the opposite direction for stocks constituent to S&P 400 and S&P 600 indices – where these dominate the lowest governance deciles. This evidence implies a distinct size effect where smaller firms that are less well capitalized and less able to afford to implement costly governance structures.

Table 5

The summary statistics for firm characteristics for the ten governance decile portfolios are also reported in Table 5, with the aggregate OECD universe in panel 3 and the US only universe in panel 4. These support the existence of a governance premium between firms with high as opposed to low governance. They also point to a range of other differences in performance attributes associated with high as opposed to low firm governance. First, the evidence in both panels (3 and 4) shows that the mean returns for value weight portfolios is lower on the lowest governance decile (D1) compared to the highest (D10) and the difference is statistically significant at ($p < 0.05$) in the value weighted case, but only marginally statistically significant ($p < 0.10$) in the equal weighted case and for the US only universe (panel 4). Second, and across both panels (3 and 4) and the strongest evidence arises from the highly statistically significant ($p < 0.005$) differences between the lowest and the highest governance deciles across all other variables with the sole exception of momentum. This is true across both universes – namely Aggregate OECD and US only. Liquidity is lower, reflected in a higher Liu

(2006) illiquidity metric, in D1 than in D10, while traded volume, book-to-market value ratio, proportion of free float capitalization and investor protection metric is lower in D1 than in D10. This is also true of the firm-level governance index and the new governance metric – both of which are lower in D1 than the highest decile, D10 ($p < 0.001$).

A notable exception to the trend of lower value variables in D1 compared to those in D10, is the proportion of daily zero price returns, which is against our expectations. The proportion of daily zero price-returns, reflects increased informational efficiency in terms of investor preferences shaped by information being crystallized into elevated order flows and stock prices and hence decreased price rigidity or proportion of daily zero returns. This is an unanticipated finding since it would be expected that price rigidity would be in line with the multi-dimensional liquidity construct of Liu (2006). A plausible explanation may be that the unidimensional character of the proportion of zero returns implies that it captures “bad” events as much as “good” events in terms of noise traders reacting to news revelations (disclosures) relating to internal company affairs. Thus, sell orders from adverse informational events generate as many price movements as buy orders from more positive, value-enhancing, events. In this way the Liu illiquidity metric offers a more comprehensive measure of liquidity that is more representative of true transactions costs of a given firm’s stock.

There are some notable differences between the Aggregate OECD and US only universes in panels 3 and 4 respectively. These are price and market capitalization – where both are much higher in the lowest governance decile (D1) than the highest decile (D10) in Aggregate OECD universe (panel 3), while the opposite is true in the US only universe (panel 4). This may be explained by there being a greater number of equity markets in the OECD universe than in the single-jurisdiction US market. Therefore, there is greater variation in levels of minority investor protection leading to a propensity for more concentrated cash flow ownership and block shareholders in the weakest governance deciles. Block shareholders are less interested in enacting costly democratic governance reforms that would both dilute their cash flow holding, voting control and influence over internal affairs and strategic orientation of the firm. However, in weaker investor protection environments, there is less institutional protection afforded to minority outside shareholders, implying significant value attached to block shareholders whose long-term incentives within the firm enhance value. This is reflected in a trend of increasing stock price from highest governance deciles (D10) to lowest governance deciles (D1). The opposite would be expected to be true in the single jurisdiction of US where generally high institutional quality afford optimal protections for minority investors. Here stock prices, indicating elevated value, are attached to firms adhering to democratic governance structure that reduces bonding costs and exacerbates transparency for minority outsiders. This would support the theory with respect

to low investor protection, that is, where there are weaker minority shareholder rights the stock market plays a less important role in the economy compared to high (governance related) investor protection environments (La Porta, Lopez-de-Silanes, Schliefer, and Vishny, 1997, 1998). The lower price associated with lower governance deciles supports the view that poorer governance and the greater likelihood of insider or controlling shareholder expropriation of minorities, leads to lower prices (La Porta, Lopez-de-Silanes, Schliefer, and Vishny, 1999, 2000).

5. The Empirical Results

The estimation results of the augmented CAPM models on the equally-weighted and value-weighted FMP ten governance decile portfolios, D1 - D10 are reported in Table 6 for all three universes used in the analysis, these being the aggregate OECD (Panel 1), the OECD excluding the US (Panel 2), and the US only (Panel 3). We present results for our two-factor CAPM augmented with the new governance factor, accounting for differences in both firm level governance and national institutional quality (Governance 2F), and comparisons against rival models, the Investor Protection two factor augmented CAPM (Investor Protection 2F), the Liu illiquidity two factor model (Liquidity 2F), the Fama and French three factor model (FF3F), the Carhart four factor model, that is, the FF3F model augmented with an additional momentum factor (Carhart 4F), and the single factor CAPM. The presentation of the empirical models is reported in Appendix C, Table 1C. For clarity we refer to each model in each universe panel followed by the abbreviation of the model. For example, our two factor CAPM augmented with the new governance measure for the aggregate OECD market universe is referred to as Panel 1: Governance 2F. All models are estimated using time series OLS, following Black, Jensen and Scholes (1972), Fama and French (1993), Pastor and Stambaugh (2003) and Liu (2006). The expectation is that the Jensen alpha should not be statistically different from zero, given the relationship between an individual portfolio's expected returns and the market (Markowitz 1959).⁸

The empirical evidence in Table 6 reveals supports for the presence of a governance-related premium, as postulated in *proposition 1*. Following GIM, we include both equal and value-weighted returns difference portfolios (see the final two columns). These last two columns show the results of the estimation of the various pricing models to the zero-cost portfolios formed from the returns difference between low governance (D1) and high governance (D10) portfolios. This is the returns generated from a strategy of buying stocks in low governance firms and selling those where

⁸ One limitation to the use of standard OLS time series has been noted in the recent literature on CAPM beta instability that results from structural breaks in the underlying data generating process (see Bollerslev and Zhang, 2003; Braun et al, 1995; Lettau and Ledvigson, 2001). Thus, we also examine time-varying parameter CAPM models as an additional robustness check in section 6.

shareholder rights are protected. Estimation results for the CAPM, FF3F, Carhart 4F, Liquidity 2F and Investor Protection 2F models show the regression alpha can be viewed as the *abnormal return* that cannot be attributed to any of the included FMPs. GIM describe these abnormal returns as “...the return in excess of what could have been achieved by passive investments in any of the factors” (p. 122). For the aggregate OECD universe (Panel 1) we find a persistent abnormal return in terms of a statistically significant alpha ($p \leq 0.05$) in all models applied to the value-weighted difference portfolio. This abnormal return ranges from -0.7 basis points per month (-8.08% per year) in the Liquidity 2F model to -0.2 basis points per month (-2.37% per year) in the Carhart 4F model. However, evidence to support an abnormal return attributable to governance is not so clear in the equal-weighted portfolio. Here, the alpha in the Carhart 4F model, Liquidity 2F model and Investor Protection 2F model are statistically significant ($p \leq 0.05$), while in the CAPM and the FF3F model it is not statistically significantly different from zero. This suggests that for these models, the investment styles are sufficient to capture differences in the cross section. The evidence is more consistent for the OECD excluding US universe (Panel 2) where all regression alphas for all models applied to both equal-weighted and value-weighted difference portfolios are statistically significant ($p \leq 0.05$). Finally, the evidence is mixed for the US only universe (Panel 3) where all alphas from the application of all models to equally-weighted difference portfolios are statistically significant ($p \leq 0.05$), while only those for CAPM, FF3F, Carhart 4F are statistically significant ($p \leq 0.05$) for value-weighted difference portfolio. However, it should be noted that the variance of value-weighted portfolios is largely reflective of a handful of large stocks, which dominate overwhelmingly the portfolio simply because of their relative size. In contrast, equal-weighted portfolios variances are more reflective of the broader cross section of stocks constituent to the portfolio.

A notable observation from our results is that for both governance 2F and Investor protection 2F models in panels 1 and 2 the direction of the trend of the coefficient beta ranges from positive in low decile portfolios (D1, D2) to negative in high decile portfolios (D9, D10). This is indicative of a premium on low governance and investor protection rated stocks as compared to their higher counterparts, which attract a discount. This finding does not fully hold for the third US only universe in panel 3. Here, there is a progressive sign change across governance betas over the range of decile portfolios, in line with that observed for the OECD universes. As before this is indicative of a governance premium on poorly governed (dictatorship) firms and a discount on their better governed (democracy) counterparts. However, there is no parallel sign movement in the investor protection betas. Although there is a general decrease in the absolute value of the betas from low decile portfolios (D1, D2) to high decile portfolios (D9, D10), this is not mirrored in a sign change. We

argue that this evidence supports *proposition 1* in terms of the persistent presence of a governance premium but leads to questionable support in relation to *proposition 2* and the equivalence of governance and investor protection only in the single country context of US only universe. This can be attributed to a lack of variation in ownership types in US universe as compared to the considerable variation across OECD universes. The evidence at this stage questions the arguments advanced by Bebchuck et al (2013) where it is argued that minority investors learn governance differences between firms and over time, through market efficiency mechanisms, and incorporate these differences into prices. In summary, our evidence corroborates our arguments for governance to be a reliable proxy for an underlying state variable based on the revealed preferences of insider controlling groups towards expropriation of minorities.

Table 6

Finally, the evidence across all models of all three universes in Table 6 reveals the statistical superiority of the governance 2F model over all other comparator models. Generally, across all decile portfolios D1 to D10, and across the first two universes, namely aggregate OECD and OECD excluding the US, there is a general increase in the adjusted-R² by 1-5 percent in the Governance 2F model as compared to all other models. However, it should be noted that in the third universe, namely the US only, the Fama and French (1993) three factor model is superior. This evidence questions the universal strength of the new Governance 2F model in a single country context.

In order to examine more closely the statistical evidence to support our *proposition 2*, we undertake an exercise comparing the results from the application of Investor Protection 2F and Governance 2F models on ten Governance sorted decile portfolios, against the Governance 2F model applied to ten Investor Protection (essentially ownership) sorted decile portfolios. The results from the initial application of Investor Protection 2F and Governance 2F models on ten Governance sorted decile portfolios are reported in Table 7 panels 1 and 2 respectively, where application is made to all three universes, namely Aggregate OECD, OECD excluding US, and US only universe.⁹ We find consistent evidence of a positive beta (a premium) on the Investor Protection and Governance factors in relation to weaker (lower) Investor Protection and Governance decile portfolios as opposed to a negative beta (a discount) stronger (higher) Investor Protection and Governance factors in relation to stronger (higher) Investor Protection and Governance decile portfolios. The evidence in panels 1 and 2 strongly supports *proposition 2*.

⁹ In essence, the results of Table 7, panel 1 and 2 we are the same as those of Table 6 panel 1 Investor Protection 2F, Panel 2 Investor Protection 2F and Panel 3 Investor Protection 2F. Similarly, for panel 1 Governance 2F, Panel 2 Governance 2F and Panel 3 Governance 2F but are reproduced in Table 7 for easier inferences concerning proposition 2.

Finally, the results from our application of the Governance 2F model to ten Investor Protection decile portfolios are reported in Table 7, panel 3. Through comparison with panel 1 we can gauge the degree of equivalence between Investor Protection and Governance in capturing the shift in governance attributes of firms. The evidence from Table 7 panels for aggregate OECD and OECD excluding the US corroborates our earlier finding of the systematic change in the sign of governance and investor protection betas from low ranking deciles to their high-ranking counterparts. The sole exception is the application of the investor protection 2F model on governance-sorted portfolios in the US single country universe where there is a lack of discernible conformity between the two metrics. The strongest evidence supporting the equivalence of governance and investor protection, as stated in *proposition 2*, is in panel 3 for the US single country universe. We find evidence regarding a systematic change of the beta in the direction of the sign less clear. This lack of systematic change in trend of the sign of the governance beta across investor protection-sorted decile portfolios across all three universes (Aggregate OECD, OECD excluding US, and US only) is much more consistent with the notion that both governance and investor protection proxy for a similar underlying state variable. Thus, effective support for dispersed ownership model (c.f. Berle and Means, 1932) mirrors the adoption of increasingly costly democratic governance attributes by firms. Both inhibit expropriation of minorities and therefore act as proxy to revealed preferences of insider controlling groups towards expropriation. This brings out the additionality of the current paper compared to Hearn, Phylaktis and Piesse (2017).

Table 7

In summary, the evidence so far points to the maintenance of *proposition 1* that a premium exists for governance, where this is defined as the product of the state institutional quality and the individual firm's governance. However, the evidence from the statistical significance of alphas and the explanatory power (adjusted- R^2) of models is more varied across the different universes. This alongside an additional running of governance 2F models on investor protection sorted, as opposed to governance-sorted, decile portfolios reveals that while there is a premium for dictatorship-orientated governance and concentrated ownership deciles, which transitions to a discount for deciles with democracy-orientated governance and a dispersed ownership model, this is true for multi-country universes typified by heterogeneous categories of block owner. However, in the single country setting of the US, where the uniform state-level institutional framework supports external third party contracting and the evidence supporting governance and investor protection is much more mixed. This

implies mixed support for *proposition 2*, where this holds for the institutionally heterogeneous universes of OECD but not in a single country context of US alone.

6. Robustness Tests.

We undertake a two robustness tests, one is to relax the assumption of time invariant coefficients and the other one is to apply another proxy for country institutional quality, namely the Legal Structure and Security of Property Rights index of Gwartney and Lawson (2007).

In the first test we use the application of Kalman filter time-varying parameter coefficient models, (see Grout and Zalewska, 2006) where these reflect the relaxation of rigid time invariant assumptions regarding the long term equilibrium associations of economic state behind the capital asset pricing framework. The Kalman filter estimation allows the relaxation of assumptions on data generating processes and a stochastic time trend accounts for structural breaks and has the advantage compared to formal switching-regression models that is not necessary to define the exact point of the switch. This is particularly important in the present study as although the timing of changes is known, the exact date of implementation is not, particularly with respect to changes in the formal institutions and regulatory environments. Furthermore, the Kalman filter estimation is less demanding of the data compared with Markov-switching models that are generally incompatible with short sample periods. The process consists of an observation equation and a transition or state equation, which 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 state variables that compose the state vector. We apply the Kalman filter estimation, which relies on the notion of state space to estimate the conditional constant term and market beta of the governance augmented CAPM, as well as of the comparison models.¹⁰ The time-varying parameter coefficient models of the Governance 2F augmented CAPM and our comparison models are outlined in Appendix C, Table 1C. The four test assets are the ten size and book-to-market decile portfolios, ten decile investor protection sorted portfolios and the ten decile governance sorted portfolios that form each of the three universes. These provide a diverse range of test assets to assess the efficiency of our models. Finally, model selection is based on two sets of statistics: information criteria (Schwarz-Bayesian Criterion, SBC; Hannan-Quinn Criterion, HQC; and Akaike Information Criterion, AIC), and the time series profile of the alpha across models.

¹⁰Applications of this method include Grout and Zalewska (2006), who examine the effects of regulation on UK and US stocks, and Brooks et al. (1998) who investigate Australian industry portfolios. This approach is appropriate to the measurement of time evolving risk premiums for market and investor protection factors (Grout and Zalewska, (2006).

There is a generally high average rate of maximum likelihood convergence of 80% across all six models and all four test assets in each universe. The evidence reported for aggregate OECD universe in (Table 8, panel 1) shows that the Governance 2F model has the lowest values for decile size, book-to-market and governance test assets and outperforms all other models in terms of the three information criteria. However, the Investor Protection 2F model is preferred in decile investor protection test assets. In the OECD excluding US markets universe (panel 2) asset pricing tests using decile size and governance test assets favour the Governance 2F model, while both decile book-to-market and investor protection test assets favour the Carhart 4F model. Finally, in the US only markets universe (panel 3) the Governance model is favoured over decile size, investor protection and governance test assets while the Carhart 4F model is only superior in the book-to-market portfolios context.

In summary, these time-varying parameter results provide support for the efficiency of the governance 2F model across Aggregate OECD universe and OECD excluding US and US only universes as well as a range of test assets. This is supportive of both *propositions 1 and 2*. It is noted that in the investor protection decile test assets the alpha is smallest and the share of standard errors that are below zero are highest for the Governance 2F model. This provides some evidence of the benefits of the governance FMP in explaining the cross section of stock returns and its persistence as a viable factor proxying an underlying state variable linked to preferences toward expropriation in explaining pricing anomalies. It equally questions the arguments of Bebchuck, Cohen, and Wang (2013) that differences in governance are “learned” by market participants and then arbitrated away as these are ultimately incorporated into stock prices.

Table 8

As an additional exercise, to show how severe macroeconomic uncertainty in state-level institutional environment, such as it prevailed during the global financial crisis, impacts minority investors monitoring ability of dominant controlling insiders block owners over the dispersed ownership governance model where a majority of minority shareholders are less effective in monitoring, we plotted the time series of the time-varying coefficient on the governance FMP of the governance 2F model as applied to the lowest D1 investor protection-sorted decile portfolio and the highest D10 investor protection-sorted portfolio on the US universe respectively. These are shown in Figures 4 and 5. The loci in Figure 4 reveals that the premium attributable to governance in the lowest ranked investor protection decile portfolio (D1), which is reflective of concentrated block ownership and accentuated insider control, changes to being a discount following the onset of the global financial

crisis in 2008. Similarly, the trend in the highest ranked investor protection decile portfolio (D10) changes from being a discount before the global financial crisis in 2008 to that of a premium afterwards (Figure 5). This evidence reveals the impact arising from severe macroeconomic uncertainty in state-level institutional environment. Under such conditions, minority investors place greater value in the monitoring ability of dominant controlling insiders block owners.

Figures 4 and 5

The second robustness test focusses on the consideration of an alternative index for state-level institutional quality. We employ the Legal Structure and Security of Property Rights index of Gwartney and Lawson (2007) - thereafter GL. This captures the protection and enforcement of property rights associated with economic and financial stakeholders and particularly those associated with minority outside investors. All models are re-estimated using the GL index¹¹, with these being both the time invariant as well as the preceding Kalman filter time varying parameter counterparts. The results are not reported here but are available online¹². The evidence provides even stronger support for our main analysis that used the broader Kaufman, Kraay, and Mastruzzi (2009) World Governance index.

First, we calculate FMP summary statistics for the aggregate OECD universe, and then the OECD excluding US and US only universes, in terms of the nationalities of the stocks sorted into each governance decile portfolio over time.¹³ The summary statistics, correlations between FMPs and nationality distribution of stocks is very similar to those of our main results using the Kaufman World Governance index reported in Tables 4 and 5. This provides reassurance for the robustness of our stock sorting process and models.

We then present the estimation results from the time invariant CAPM, FF3F, Carhart 4F, Liquidity 2F, Investor Protection 2F and our Governance 2F models, for both universes, namely the aggregate OECD and OECD excluding the US.¹⁴ These universes are those susceptible to institutional change and differences between national institutional frameworks that is picked up in our governance measure. The US only universe is the same as in our main results as being a single country the governance measure in effect becomes a metric capturing solely the differences in governance between firms. The results provide substantial support for those obtained in our main analysis when using the Kaufman World Governance index. In particular, there is consistent support in both universes, and

¹¹ Index values can be obtained from the authors' website: <http://www.freetheworld.com/>

¹² The tables can be accessed in Appendix D of the SSRN version of the paper.

¹³ see Appendix D, Tables 1D and 2D on the online version.

¹⁴ See Appendix D, Tables 3D and 4D on the online version.

confirms the superiority of our new Gov2F model over comparable FF3F, Carhart 4F, Liquidity 2F and Investor Protection 2F configurations. This is evident in terms of higher adjusted R^2 and low regression Jensen alphas in both in terms absolute size and negligible statistical significance. However, the strongest support for our new governance measure is in the farthest two right hand columns that outline the results from testing all other factor models that explain the variance of equal and value weighted Investor Protection portfolios. In all cases the regression Jensen alphas are large and statistically significant.

These findings are further verified by the application of Kalman-filter time varying parameter models¹⁵. Here the Governance 2F model outperforms all other time-varying parameter models (based on CAPM, FF3F, Carhart 4F, Liquidity 2F and Governance 2F) in terms of informational criteria (SBC, AIC, HQC). This is also substantiated by the high proportions of models that attain maximum likelihood convergence, for example, over 70% for our new Governance 2F model. These time varying results are notably better than those reported in Table 7 of the main analysis.

In summary and the evidence from the robustness checks supports *propositions 1 and 2*.

7. Conclusions

The level of investor protections afforded by firms to minority owners is reflective of the revealed preferences towards expropriation by controlling insider groups or block holders. This is the focus of the decision to expropriate cash flows rather than pay dividends – where these infringements on property rights are typically hard to measure and evaluate. The governance structure of the firm acts to reduce bonding costs and enhance transparency for minorities and thus, it is a suitable proxy for these underlying expropriation tendencies in terms of whether insiders prefer to adopt costly governance provisions of benefit from an aggregate reduction in the cost of funds that facilitates longer term productivity and profitability of the firm. We argue that contrary to adaptive efficient market theory, investors and market participants do not “learn” the differences between strongly and weakly governed firms and ultimately incorporate these into stock prices. Rather, we argue that the governance structure is itself a dynamic changing notion and is reflective of the underlying changes regarding the revealed preferences towards expropriation by controlling insiders. In this way differences in returns for firms across the cross section of stock returns are reflective of a pervasive underlying state variable that is responsible for persistent pricing anomalies.

We propose a new governance measure of investor protection defined as the product of national institutional quality and the governance rating of firms. Firm’s governance provisions are

¹⁵ See Appendix D, Table 5D on the online version.

assessed on the basis of whether they are “democratic” and enhancing minority shareholder protections, or “dictatorship” and engendering insider’s control. Extensive tests of variants of the augmented-CAPM, including time-varying parameter Kalman filter methods, show that a two factor CAPM augmented with a factor mimicking portfolio based on our new governance metric yields the highest explanatory power for a cross section of stock returns in a multi-country sample. Our evidence reveals consistent support for the new governance valuation factor and a governance premium attributable to minorities participating in weakly (dictatorship-orientated) governed firms as opposed to a discount for participating in their strongly (democracy-orientated) counterparts. These findings are consistent multi-country (OECD) universes, where these groups of markets are characterised by considerable variation in the types of ownership prevalent.

In general, our results indicate variations in abnormal returns on portfolios that reflect returns differences between democratic (strong) and dictatorship (weak) governance sorted deciles not explained by existing augmented CAPMs. These abnormal returns range from -0.2 basis points per month (an annualized 2.37%) to -0.7 basis points per month (an annualized 8.08%) for value weighted portfolios. This confirms the importance of differences in governance and that minority investors should seek a premium to compensate for potential welfare losses and a means of hedging these losses within a conventional asset pricing framework.

References

- Albuquerque, R., & Wang, N. (2008). Agency conflicts, investment, and asset pricing. *The Journal of Finance*, LXIII(1), 1-40
- Bebchuck, L., Cohen, A., & Ferrell, A. (2009). What matters in corporate governance. *Review of Financial Studies*, 22, 783-827
- Bebchuck, L., Cohen, A., & Wang, C. C. Y. (2013). Learning and the disappearing association between governance and returns. *Journal of Financial Economics*, 108, 322-348
- Berle, A. & Means, G. (1932) *The Modern Corporation and Private Property*. New York, Macmillan
- Bewley, T. F. (2002). Knightian decision theory. Part I. *Decisions in Economics and Finance*, 25, 79-110
- Black, F., Jensen, M. C., Scholes, M., 1972. The capital asset pricing model: Some empirical tests. In M. C. Jensen (ed.), *Studies in the Theory of Capital Markets*. New York, NY: Praeger
- Bollerslev T. & Zhang, B. (2003) Measuring and Modeling Systematic Risk in Factor Pricing Models using High-Frequency Data. *Journal of Empirical Finance*, 10, 533-558
- Braun P., Nelson, D. & Sunier, A. (1995) Good News, Bad News, Volatility, and Betas. *Journal of Finance*, 50, 1575-1603
- Brooks, R. D., Faff, R. W. & McKenzie, M. D. (1998) Time-varying beta risk of Australian industry portfolios: A comparison of modelling techniques. *Australian Journal of Management*, 23, 1-22
- Carhart, M., 1997. On persistence in mutual fund performance. *Journal of Finance*, 52, 57-82
- Chen, K. C. W., Chen, Z., & Wei, K. C. J. (2009). Legal protection of investors, corporate governance, and the cost of equity capital. *Journal of Corporate Finance*, 15, 273-289
- Coffee, J. (1999). The future as history: The prospects for global convergence in governance and its implications. *Northwestern University Law Review*, 93, 641–708
- Coffee, J. (2002). Racing towards the top? The impact of cross-listing and stock market competition on international corporate governance. *Columbia Law Review*, 102, 1757–831
- Daniel, K., & Titman, S. (1999). Market efficiency in an irrational world. *Financial Analysts Journal*, 55, 28-40
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A. (2008). The law and economics of self-dealing. *Journal of Financial Economics*. 88, 430-465
- Doidge, C., Karolyi, A., & Stulz, R. (2007) Why do countries matter so much for corporate governance? *Journal of Financial Economics*, 86, 1-39

- Errunza, V., & Losq, E. (1985). International asset pricing under mild segmentation: Theory and test. *The Journal of Finance*, 40(1), 105-124
- Fama, E. (1970). Efficient capital markets: a review of theory and empirical work. *Journal of Finance*, 25, 383-417
- Fama, E. F., (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, 88, 288-306
- Fama, E., & French, K. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33, 3-56
- Giannetti, M., & Koskinen, Y. (2010). Investor protection, equity returns, and financial globalization. *Journal of Financial and Quantitative Analysis*, 45(1), 135-168
- Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics*, 118(1), 107-155
- Goyenko, R. Y., Holden, C. W., & Trzcinka, C. A. (2009). Do liquidity measures measure liquidity? *Journal of Financial Economics*, 92, 153-181
- Grout, P. A. & Zalewska, A. (2006) The impact of regulation on market risk. *Journal of Financial Economics*, 80, 149-184
- Gwartney, J., & Lawson, R. (2007). Economic Freedom of the World: 2007 Annual Report. The Fraser Institute, Vancouver. Data retrieved from www.freetheworld.com
- Hearn, B. (2014). The political institutional and firm governance determinants of liquidity: Evidence from North Africa and the Arab Spring. *Journal of International Financial Markets, Institutions & Money*, 31, 127–158
- Hearn, B., Phylaktis, K., & Piesse, J. (2017). Expropriation risk by block holders, institutional quality and expected stock returns. *Journal of Corporate Finance*, 45, 122-149
- Heinkel, R., Krauss, A., & Zechner, J. (2001). The effect of green investment on corporate behaviour. *Journal of Financial and Quantitative Analysis*, 36(4), 431-449
- Hou, K., Karolyi, G. A., & Kho, B-C. (2011). What factors drive global stock returns? *Review of Financial Studies*, 24(8), 2527-2574
- Ince, O., & Porter, R. B. (2003). Individual equity return data from Thomson Datastream: Handle with care! *Journal of Financial Research*, 29, 463-479
- Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *The Journal of Finance*, 48(1), 65-91
- Jegadeesh, N., & Titman, S. (2001). Profitability of momentum strategies: An evaluation of alternative explanations. *The Journal of Finance*, 56(2), 699-720

- Jensen, M. C., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3, 305-360
- Kaufman, D., Kraay, A., & Mastruzzi, M. (2009). Governance Matters VIII: Governance Indicators for 1996-2008. World Bank Policy Research Unit June 2009
- Klapper, L. F., & Love, I. (2004). Corporate governance, investor protection, and performance in emerging markets. *Journal of Corporate Finance*, 10, 703-728
- La Porta, R., Lopez-de-Silanes, F., Schliefer, A., & Vishny, R. (1997). Legal Determinants of External Finance. *The Journal of Finance*, 52, 1131-1150
- La Porta, R., Lopez-de-Silanes, F., Schliefer, A., & Vishny, R. (1998). Law and Finance. *Journal of Political Economy*, 106(6), 1113-1155
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the World. *The Journal of Finance*, 54, 471-518
- La Porta, R., Lopez-de-Silanes, F., Schliefer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, 58, 3-27
- La Porta, R., Lopez-de-Silanes, F., Schliefer, A., & Vishny, R. (2002). Investor protection and corporate valuation. *The Journal of Finance*, 57(3), 1147-1170
- Lesmond, D. A. (2005). Liquidity of emerging markets. *Journal of Financial Economics*, 77, 411-52
- Lettau, M. & Ledvigson, S. (2001) Consumption, Aggregate Wealth, and Expected Stock Returns. *The Journal of Finance*, LVI (3), 815 - 849
- Liu, W., 2006. A Liquidity-augmented capital asset pricing model. *Journal of Financial Economics*, 82, 631-671
- Markowitz, H. (1959). *Portfolio Selection: Efficient Diversification of Investments*. John Wiley and Sons, New York; Chapman and Hall, London, 1959
- North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, 5(1), 97-112
- North, D. (1994) Economic performance through time. *The American Economic Review*, 84 (3), 359-68
- O'Hara, M. (2003): Presidential address: liquidity and price discovery. *Journal of Finance*, 58, 1335-1354
- Pastor, L. & Stambaugh, R. (2003) Liquidity risk and expected stock returns. *Journal of Political Economy*, 111, 642-685
- Schleifer, A., & Vishny, R. (1997). The limits of arbitrage. *Journal of Finance*, 52, 35-55
- Spamann, H. (2010). The "Antidirector Rights Index" revisited, *Review of Financial Studies*, 23, 467-486

Thomson Reuters ESG Scores (2017). Thomson Reuters ESG Scores.

<http://financial.thomsonreuters.com/esg> Accessed 14 September 2017

Williamson O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38(3), 595-613

Williamson, O. E. (2002). The theory of the firm as governance structure: From choice to contract. *Journal of Economic Perspectives*, 16(3), 171-195

Table 1. Individual elements of firm-level governance

This table outlines the governance elements we have included as an integral part of the firm-level governance structure. Each element is sourced from Thomson Reuters ASSET4-ESG database and has been classified in terms of “democracy” or “dictatorship” in relation to the degree of power it gives external minority shareholders in comparison with incumbent insiders. This classification follows the GIM study. Each element is defined and has been included due to its simple binary coding of “Y” or “N” which can be easily codified into binary 1/0 facilitating the formation of a governance index. For more details on the definition of structural elements and parameters of ESG scores look at Thomson Reuters ESG Scores, 2017, <https://developers.thomsonreuters.com/content/environmental-social-and-corporate-governance-esg>

Governance element	Type	Definition
Minority rights		
Board diversity policy	Democracy	Does the company have a policy regarding the diversity of its board?
Adequate experience of board policy	Democracy	Does the company have a policy regarding the adequate experience on its board?
Board independence policy	Democracy	Does the company have a policy regarding the independence of its board?
Board size policy	Democracy	Does the company have a policy regarding the size of its board?
CEO board member	Democracy	Is the CEO is a board member?
Chairman is ex-CEO	Dictatorship	Has the chairman previously held the CEO position in the company?
Nomination committee	Democracy	Does the company have a nomination committee?
Succession plan for executives	Democracy	Does the company have a succession plan for executive management in the event of unforeseen circumstances?
Corporate governance committee	Democracy	Does the company have a corporate governance committee?
External consultants	Democracy	Does the board or board committees have the authority to hire external advisers or consultants without management's approval?
Golden parachute	Dictatorship	Does the company have a golden parachute or other restrictive clauses related to changes of control (compensation plan for accelerated pay-out)?
Limitation of director liability	Dictatorship	Does the company have a limitation of director liability?
Limitations on removal of directors	Dictatorship	Are there limitations on the shareholders' right to remove board members (i.e., only for cause, supermajority vote required, etc.)?
Limited shareholder rights to call meetings	Dictatorship	Has the company limited the rights of shareholders to call special meetings?
Majority requirements for election of directors	Dictatorship	Are the company's board members elected with a majority vote?
Poison pill	Dictatorship	Does the company have a poison pill (shareholder rights plan, macaroni defence, etc.)?
Voting		
Advance notice for shareholder proposals	Democracy	Does the company have deadlines relating to shareholder proposals?
Confidential voting policy	Democracy	Does the company have a confidential voting policy (i.e., management cannot view the results of shareholder votes)?
Different share classes different rights	Dictatorship	Does the company have different class stocks with different voting rights?
Elimination of cumulative voting rights	Dictatorship	Has the company reduced or eliminated cumulative voting in regard to the election of board members?
Expanded constituency provision	Democracy	Does the company have expanded-constituency provisions in place?
Fair price provision	Democracy	Is the company subject to fair price provision, either under applicable law or as stated in the company documents (charter or bylaws)?
Min. number of shares to vote	Dictatorship	Has the company set requirements for a minimum number of shares to vote?

Voting cap	Dictatorship	Does the company have shares with a voting cap (ceilings) clause, ownership ceilings or control share acquisition provision?
Significant company transactions (M&A) shareholder's approval	Dictatorship	Limitations to the shareholders right to approve significant company transitions such as M&As (no rights to vote or supermajority required)?
Supermajority vote requirements	Dictatorship	Does the company have a supermajority vote requirement or qualified majority (for amendments of charters and bylaws or lock-in provisions)?
Written consent requirements	Democracy	Does the company permit actions to be taken without meeting by written consent?
Integrated strategy in MD&A	Democracy	Does the company explicitly integrate financial and extra-financial factors in its management discussion and analysis (MD&A) section in the annual report?
Equal voting right policy	Democracy	Does the company have a policy to apply the one-share, one-vote principle?
Shareholder engagement policy	Democracy	Does the company have a policy to facilitate shareholder engagement, resolutions or proposals?
Pre-emptive rights	Dictatorship	Does the company grant pre-emptive rights to existing shareholders?
Public availability corporate statutes	Democracy	Are the company's articles of association, statutes or bylaws publicly available?
Delay		
Classified board structure	Dictatorship	Does the company have a classified board structure?
Staggered board structure	Dictatorship	Does the company have a staggered board structure?
Company cross shareholding	Dictatorship	Does the company have significant cross shareholding that can prevent takeovers?
Golden share	Dictatorship	Does the biggest owner (by voting power) hold the veto power or own golden shares?
Blank check	Dictatorship	Does the company have unlimited authorized capital or a blank check?
State owned enterprise	Dictatorship	Is the company a State Owned Enterprise (SOE)?
Director Incentives		
Shareholder's approval of stock based compensation Plan	Democracy	Does the company require that shareholder approval is obtained prior to the adoption of any stock based compensation plans?
CEO compensation link to shareholder return	Democracy	Is the CEO's compensation linked to total shareholder return?
Compensation committee	Democracy	Does the company have a compensation committee?
Compensation improvement tools	Democracy	Does the company have the necessary internal improvement and information tools for the board members to develop appropriate compensation/remuneration to attract and retain key executives?
Executive retention compensation policy	Democracy	Does the company have a compensation policy to attract and retain executives?
Performance oriented compensation policy	Democracy	Does the company have a performance oriented compensation policy?
Shareholders vote on executive pay	Democracy	Do the company's shareholders have the right to vote on executive compensation?

Table 2 Summary of governance elements

This table presents the percentage of firms with each provision – classified per US universe (these being constituents of large, mid and small cap indices – namely S&P500, S&P400, and S&P600 and the OECD excluding US – where these are subdivided between common law, civil code law and overall for the year 2015. Overall is defined as the whole sample of firms. All data is sourced from Thomson Reuters ASSET4-ESG database. It should be noted that this is the proportion of firms that report governance in ASSET4-ESG database that then have implemented any of the governance provisions – be these dictatorship or democracy orientated elements. Cross shareholding element is not reported in any US firms for year 2015.

Governance element	Type	Percentage (%) of firms with governance provisions in:					
		US			OECD excl. US		
		S&P500	S&P400	S&P600	Civil Code law	Common law	Overall
Minority rights							
Board diversity policy	Democracy	71.30	63.54	69.96	25.73	77.87	50.00
Adequate experience of board policy	Democracy	99.78	99.46	97.63	43.44	95.28	67.57
Board independence policy	Democracy	98.43	93.83	90.91	39.43	64.94	51.31
Board size policy	Democracy	95.07	93.30	86.96	71.04	80.79	75.58
CEO board member	Democracy	98.43	95.44	97.63	41.78	84.49	61.66
Chairman is ex-CEO	Dictatorship	73.32	63.00	53.36	22.90	13.60	18.57
Nomination committee	Democracy	78.03	83.11	86.17	42.07	83.03	61.14
Succession plan for executives	Democracy	98.88	97.05	94.86	36.20	90.11	61.30
Corporate governance committee	Democracy	97.09	95.17	92.49	12.33	35.96	23.33
External consultants	Democracy	99.55	99.73	99.60	44.42	94.49	67.73
Golden parachute	Dictatorship	95.96	72.92	24.90	11.25	36.52	23.01
Limitation of director liability	Dictatorship	99.55	75.34	25.30	57.14	91.80	73.27
Limitations on removal of directors	Dictatorship	45.52	43.16	13.44	6.56	8.88	7.64
Limited shareholder rights to call meetings	Dictatorship	98.65	74.53	24.90	27.01	22.13	24.74
Majority requirements for election of directors	Dictatorship	84.08	66.49	55.73	52.94	87.53	69.04
Poison pill	Dictatorship	5.38	9.38	9.09	0.29	2.92	1.52
Voting							
Equal voting right policy	Democracy	93.95	94.37	92.89	56.36	96.29	74.95
Shareholder engagement policy	Democracy	97.98	95.98	95.26	45.69	81.46	62.34
Pre-emptive rights	Dictatorship	2.69	0.80	0.79	48.14	8.99	29.92
Public availability corporate statutes	Democracy	98.65	96.51	96.44	67.22	61.12	64.38
Advance notice for shareholder proposals	Democracy	99.33	75.07	25.30	33.27	57.30	44.46
Confidential voting policy	Democracy	50.45	23.06	7.91	5.48	6.52	5.96

Different share classes different rights	Dictatorship	6.05	5.63	6.72	40.70	3.37	23.33
Elimination of cumulative voting rights	Dictatorship	77.13	54.69	19.37	18.40	3.71	11.56
Expanded constituency provision	Democracy	9.19	6.70	2.37	1.96	1.46	1.73
Fair price provision	Democracy	19.06	16.89	3.16	0.78	0.34	0.58
Min. no. shares to vote	Dictatorship	0.67	1.34	1.19	32.68	1.01	17.94
Voting cap	Dictatorship	2.02	1.07	0.00	5.19	2.81	4.08
Significant company transactions (M&A) shareholder's approval	Democracy	66.37	49.60	16.21	12.82	2.02	7.79
Supermajority vote requirements	Dictatorship	51.57	45.31	14.62	41.78	58.43	49.53
Written consent requirements	Democracy	46.86	40.21	13.83	1.17	3.60	2.30
Integrated strategy in MD&A	Democracy	8.52	3.49	3.16	11.55	35.51	22.70
Delay							
Classified board structure	Dictatorship	0.00	0.00	0.00	0.68	0.00	0.37
Staggered board structure	Dictatorship	20.18	32.98	9.49	16.14	32.13	23.59
Company cross shareholding	Dictatorship	-- --	-- --	-- --	0.29	0.00	0.16
Golden share	Dictatorship	3.14	2.68	5.14	14.68	8.09	11.61
Blank check	Dictatorship	94.17	69.17	25.30	2.05	26.74	13.55
State owned enterprise	Dictatorship	0.00	0.00	0.00	2.35	0.67	1.57
Director Incentives							
Shareholder's approval of stock based compensation Plan	Democracy	95.07	96.51	95.65	24.27	63.37	42.47
CEO compensation link to shareholder return	Democracy	78.92	62.47	43.08	12.33	64.61	36.66
Compensation committee	Democracy	95.52	97.32	98.42	42.86	87.53	63.65
Compensation improvement tools	Democracy	99.10	98.39	97.23	26.71	88.65	55.54
Executive retention compensation policy	Democracy	99.55	99.20	97.63	28.28	88.09	56.12
Performance oriented compensation policy	Democracy	100.00	99.46	99.21	65.46	92.25	77.93
Shareholders vote on executive pay	Democracy	95.07	96.51	95.65	24.27	63.37	42.47
Number of constituent firms:		500	400	600	2,050	1,164	3,244
Number of firms with governance (in ASSET4):		446	373	253	1,022	890	1,912

Table 3 Summary of governance, institutional quality and investor protection statistics

This table reports summary statistics for the sample markets. The start date reflects beginning of data reporting for stocks in each market in Datastream, the number is the stocks in the respective blue chip index used. National blue chip indices and their Datastream codes are in Appendix B Table 1B. The new governance metric is the product of firm governance index and country-level institutional quality. We multiply the result by 100 for easier reading. The firm governance index is based on 45 elements reported in ASSET4-ESG. Institutional quality is the country-level aggregate institutional quality, reported on a 0-1 scale, where this is the average of the rescaled six underlying World Governance indicators (Democratic voice and accountability; Political stability and absence from violence; Government Effectiveness; Regulatory quality; Rule of law; and Control of corruption) sourced from Kaufman, Kraay, and Mastruzzi, (2009). These are downloadable from <http://www.govindicators.org>. Datastream reports the free float proportions (%). The investor protection metric is based on a stock-by-stock basis and is the product of free float proportion and country-level aggregate institutional quality. Descriptive statistics for trading and liquidity measures use Datastream for the daily prices, volume, market capitalization and free float information. Monthly returns are the average returns of each stock over a monthly interval. Market capitalization is measured at 1 January for each country and is the equity market value for each firm in billions of US\$. The US\$ market capitalization is measured at the end of month exchange rate for each country and each month. The book to market value ratio is the inverse of the Datastream price-to-book value, for each stock. Momentum is the time series average of the percentage cumulative return for each stock over the prior six months, omitting the most recent month, and is monthly, following Jegadeesh and Titman (1993). The Liu (1 year) metric is the illiquidity measure of Liu (2006) estimated over a prior 1 year ranking period. Square brackets indicate median values. Values are averages over the sample period January 2000 and 2017. Square brackets indicate median values. N and N_{A4} are sample size from that country or index, and the proportion of coverage of that sample that is also contained in ASSET4-EFG database respectively. Developed and emerging markets are distinguished using the MSCI classification.

Country	N	N _{A4}	Governance metric			Investor protection metric			Descriptive statistics				
			Governance (0 – 4,500)	Firm governance Index (0 - 45)	Inst. quality (0 - 1)	Investor Protection (0 – 10,000)	Free-Float (%)	Inst. quality (0 - 1)	Market cap. (US\$)	Book to Market value ratio	Liu metric	liquidity	
North America													
Canada	248	224	2,174 [2,197]	23.69 [24.00]	0.9143	7,201 [7,927]	78.82 [88.00]	0.9143	4.37 [1.27]	0.732 [0.565]	17.37 [9.65]		
US S&P 500	500	446	2,242 [2,278]	27.05 [28.00]	0.8380	6,370 [6,947]	75.81 [84.00]	0.8380	16.55 [0.21]	1.450 [0.905]	13.76 [8.69]		
US S&P 400	400	373	2,193 [2,221]	26.53 [27.00]	0.8380	6,025 [6,425]	72.13 [77.07]	0.8380	2.81 [1.94]	0.504 [0.470]	16.69 [8.68]		
US S&P 600	600	253	2,117 [2,049]	25.92 [25.00]	0.8380	5,905 [6,180]	70.67 [75.00]	0.8380	0.97 [0.61]	0.607 [0.541]	18.09 [8.69]		
Europe Developed													
Austria	20	13	1,658 [1,644]	18.49 [18.00]	0.8962	4,957 [4,902]	54.91 [55.00]	0.8962	3.19 [2.10]	0.841 [0.812]	17.26 [12.60]		
Belgium	20	19	1,867 [1,916]	22.12 [23.00]	0.8454	5,324 [5,104]	62.78 [59.00]	0.8454	24.02 [7.02]	0.773 [0.683]	8.67 [5.77]		
France	60	51	1,590 [1,604]	19.53 [20.00]	0.8149	5,607 [5,890]	68.44 [72.00]	0.8149	22.72 [12.41]	0.650 [0.531]	7.02 [5.77]		
Germany	100	48	1,725 [1,704]	19.50 [19.00]	0.8855	5,263 [6,017]	59.44 [68.00]	0.8855	10.83 [2.65]	1.525 [0.529]	21.96 [7.70]		
Ireland	47	14	2,119 [2,095]	24.10 [23.00]	0.8830	6,166 [6,381]	69.44 [71.50]	0.8830	187.62 [0.47]	1.334 [0.573]	57.32 [16.39]		
Italy	74	1	1,073 [1,079]	16.17 [17.00]	0.6783	2,921 [2,674]	42.96 [40.50]	0.6783	0.31 [0.15]	0.580 [0.685]	15.84 [7.72]		
Luxembourg	9	2	1,860 [1,976]	19.98 [21.00]	0.9348	4,661 [4,858]	49.97 [52.00]	0.9348	10.77 [1.23]	1.504 [1.304]	54.18 [22.29]		
Netherlands	140	40	2,145 [2,167]	23.14 [23.00]	0.9315	5,901 [6,300]	63.32 [66.00]	0.9315	112.51 [0.67]	0.780 [0.582]	26.54 [5.77]		
Portugal	47	11	1,548 [1,583]	19.73 [20.00]	0.7860	2,967 [2,689]	37.83 [34.55]	0.7860	2.64 [0.19]	0.934 [0.728]	38.50 [5.81]		
Spain	108	49	1,642 [1,705]	21.80 [22.00]	0.7629	4,258 [4,011]	55.89 [54.61]	0.7629	9.17 [0.93]	0.601 [0.599]	16.59 [5.81]		
Switzerland	100	61	1,900 [1,867]	20.22 [20.00]	0.9429	6,183 [6,424]	65.57 [68.50]	0.9429	8.87 [1.93]	0.595 [0.456]	13.99 [9.61]		
UK FTSE 100	101	98	2,206 [2,166]	25.34 [25.00]	0.8768	6,526 [7,779]	74.05 [89.00]	0.8768	25.89 [9.46]	0.548 [0.416]	10.75 [7.72]		
UK FTSE 250	251	234	2,014 [2,029]	23.12 [23.00]	0.8768	6,008 [7,141]	68.01 [80.87]	0.8768	1.53 [1.07]	0.745 [0.576]	17.10 [7.72]		

Scandinavia											
Denmark	135	34	1,875 [1,850]	19.69 [19.00]	0.9556	5,797 [5,838]	60.42 [61.00]	0.9556	7.73 [0.08]	0.931 [0.816]	53.79 [14.48]
Finland	135	31	1,870 [1,888]	19.37 [20.00]	0.9683	5,946 [6,201]	61.19 [65.50]	0.9683	2.22 [0.24]	0.714 [0.610]	34.75 [10.62]
Iceland	16	0	-- --	-- --	0.9146	3,459 [3,133]	38.18 [32.50]	0.9146	0.29 [0.21]	0.751 [0.577]	106.16 [67.58]
Norway	25	17	1,932 [1,995]	20.63 [21.00]	0.9359	5,677 [5,481]	60.53 [58.25]	0.9359	8.95 [1.98]	0.766 [0.649]	16.63 [9.65]
Sweden	89	58	1,859 [1,874]	19.64 [20.00]	0.9452	6,590 [7,070]	69.43 [74.54]	0.9452	6.96 [1.65]	0.645 [0.515]	14.36 [9.65]
Europe Emerging											
Czech Republic	24	6	1,329 [1,289]	17.93 [17.50]	0.7338	2,526 [2,240]	34.63 [30.00]	0.7338	2.28 [0.35]	1.286 [0.947]	66.97 [9.69]
Estonia	32	0	-- --	-- --	0.7804	3,770 [3,167]	47.96 [40.00]	0.7804	0.14 [0.05]	0.855 [0.856]	116.21 [103]
Greece	60	18	1,212 [1,224]	18.72 [18.50]	0.6568	3,406 [3,016]	51.06 [43.17]	0.6568	0.54 [0.21]	1.332 [0.942]	20.52 [11.13]
Hungary	14	4	1,372 [1,428]	19.71 [21.00]	0.7148	3,586 [3,618]	49.74 [50.00]	0.7148	1.43 [0.11]	0.919 [0.777]	23.99 [11.63]
Latvia	67	0	-- --	-- --	0.6871	2,127 [1,337]	31.08 [20.00]	0.6871	44.27 [4.15]	1.231 [1.859]	132.08 [110]
Poland	20	8	1,123 [1,096]	15.87 [15.00]	0.7006	3,464 [3,487]	49.59 [49.50]	0.7006	4.21 [3.15]	0.720 [0.644]	18.20 [9.69]
Slovakia	50	0	-- --	-- --	0.7004	1,494 [1,204]	21.27 [18.00]	0.7004	0.12 [0.06]	2.883 [2.428]	178.58 [198]
Slovenia	7	0	-- --	-- --	0.7549	4,320 [4,704]	57.24 [63.00]	0.7549	0.69 [0.47]	1.069 [0.823]	19.55 [12.55]
Australasia											
Australia	300	259	2,164 [2,214]	24.06 [25.00]	0.9067	6,458 [6,769]	71.61 [75.00]	0.9067	3.40 [0.67]	0.675 [0.556]	29.96 [7.75]
New Zealand	116	45	2,067 [2,019]	21.70 [21.00]	0.9496	5,927 [6,294]	62.22 [65.50]	0.9496	0.48 [0.14]	0.782 [0.665]	60.90 [20.82]
Asia											
Japan	498	383	1,011 [921]	12.31 [11.00]	0.8191	6,622 [7,278]	80.36 [88.00]	0.8191	7.33 [2.61]	0.843 [0.778]	18.42 [15.38]
South Korea	100	91	803 [694]	11.37 [9.00]	0.7004	4,383 [4,466]	62.39 [62.00]	0.7004	6.27 [3.15]	1.136 [0.872]	17.45 [13.49]
MEA											
Israel	101	16	1,192 [1,250]	17.42 [18.50]	0.6831	2,638 [2,216]	38.93 [32.00]	0.6831	1.02 [0.22]	0.864 [0.746]	43.74 [15.50]
Turkey	30	22	757 [762]	14.88 [14.50]	0.5014	1,884 [1,780]	37.38 [35.00]	0.5014	3.22 [1.73]	0.8357[0.725]	12.95 [8.72]
Latin America											
Chile	40	23	1,015 [1,011]	12.64 [12.00]	0.8056	2,950 [2,974]	36.35 [36.00]	0.8056	2.98 [1.67]	0.960 [0.625]	25.76 [11.58]
Mexico	60	32	645 [562]	12.73 [12.00]	0.5049	3,102 [2,605]	61.03 [51.00]	0.5049	22.97 [1.47]	0.907 [0.578]	42.52 [9.65]
OECD civil code	2,050	1,022	1,317 [1,217]	15.88 [15.00]	0.7949	5,098 [5,317]	61.27 [64.00]	0.7949	25.48 [1.28]	0.854 [0.688]	35.33 [12.60]
OECD common law	2,664	1,962	2,147 [2,187]	25.25 [26.00]	0.8545	6,058 [6,563]	70.56 [77.90]	0.8545	7.87 [0.90]	0.811 [0.560]	23.19 [8.69]
OECD excl. US	3,214	1,912	1,678 [1,842]	19.42 [21.00]	0.8099	5,434 [6,014]	63.63 [70.00]	0.8099	19.61 [1.15]	0.813 [0.647]	34.09 [10.60]
US only	1,500	1,072	2,187 [2,215]	26.54 [27.00]	0.8380	6,093 [6,510]	72.78 [78.02]	0.8380	6.68 [0.88]	0.863 [0.551]	16.27 [8.69]
OECD Overall	4,714	2,984	1,877 [2,045]	22.20 [24.00]	0.8122	5,645 [6,311]	66.56 [75.00]	0.8122	15.53 [1.06]	0.829 [0.611]	28.42 [8.71]

Table 4 Factor mimicking portfolio summary statistics – for Aggregate OECD market universe

This table reports the descriptive statistics, autocorrelations (at 1, 6 and 12 lags) for returns-based valuation factors including the Market, the Fama and French (1993) size (SMB) and book to market value (HML), the Jegadeesh and Titman (1993) momentum factor and the Liu (2006) liquidity factor, the Investor Protection Hearn, Phylaktis, and Piesse, (2017), and the new Governance metric used to explain cross section of stock returns across the market universe. The market universe in this case is the aggregate OECD and is equal-weighted. All factors are obtained from equal-weighted portfolios while the FF size (SMB) and book-to-market value (HML) factors are value-weighted. Summary statistics are also reported, with t-difference in means, for the highest and lowest liquidity sorted portfolios (used to create the liquidity-based valuation factor). These are based on stock returns, book-to-market value, size (market capitalization US\$), stock price, traded volume, monthly bid-ask spread and monthly percentage daily volatility in daily stock returns. Liquidity, Governance and Investor Protection portfolios D1 and D10 are formed from annual rebalancing. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	Market	SMB	HML	Liquidity (1 year)	Momentum	Investor Protection (1 year)	Governance (1 year)
	Equal weight	Value weight	Value weight	Equal weight	Equal weight	Equal weight	Equal weight
Panel 1: Descriptive statistics Aggregate OECD							
Mean (%)	1.12%	1.86%	0.03%	-1.13%	-0.12%	0.15%	0.19%
t-statistic	3.23**	7.33**	0.13	-4.56**	-0.34	1.88†	1.92*
Standard Deviation (%)	4.92%	3.59%	3.18%	3.52%	5.03%	2.48%	2.94%
Skewness	-0.67	-0.42	-0.03	-2.62	2.05	2.47	-0.08
Kurtosis	6.20	4.65	4.64	23.71	12.35	22.62	3.86
Jarque-Bera statistic	100.43	28.68	22.67	3,819.76	873.25	3,429.58	6.40
Panel 2: Pearson correlations Aggregate OECD							
Market	1.000						
SMB	-0.424**	1.000					
HML (Book to Market value)	0.201**	-0.155*	1.000				
Liquidity (1 Year Rebalance)	0.383**	-0.335**	-0.011	1.000			
Momentum	0.412**	-0.458**	0.128*	0.225**	1.000		
Investor Protection (1 Year Rebalance)	-0.028	-0.024	-0.044	0.101†	0.069	1.000	
Governance (1 Year Rebalance)	-0.009	0.071	0.021	-0.046	-0.114*	0.155*	1.000
Panel 3: Autocorrelations Aggregate OECD							
1-Lag	0.217	0.237	0.177	-0.094	0.178	0.106	0.079
6-Lags	-0.118	-0.019	0.118	-0.065	0.004	-0.013	0.027
12-Lags	0.015	0.133	0.106	0.094	0.068	0.098	0.075

Table 5 Characteristics of governance FMPs for aggregate OECD market and US only universes

This table reports the stock counts by country and ownership descriptive statistics for all ten decile sorted governance portfolios (D1 – D10). Panel 1 reports a breakdown of stock counts per portfolio with respect to legal origin of their listing market and is by German, French and Scandinavian civil code versus English common law classification, following Djankov, La Porta, Lopez-de-Silanes and Schleifer (2008). Developed and emerging markets are distinguished using the MSCI classification system. Summary statistics are reported in Panel 2 for a breakdown of stock counts for all ten decile sorted investor protection portfolios (D1 – D10) for US only universe, while panel 3 for the OECD market universe and panel 4 for the US-only universe. These show summary statistics for several stock-characteristic variables per decile-sorted portfolio. These are returns (equally and value weighted decile portfolios), momentum, the Liu-liquidity metric, market capitalization (US\$ billions), traded volume (US\$ millions), the monthly proportion of daily zero returns (%), mean daily stock closing price (US\$), Book-to-market value, free float proportion (%) and the investor protection metric. In the first column a t-difference in means statistical significance confidence level is provided for mean values in decile portfolio D1 in relation to the differences between these and D10. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
Panel 1: Stock count (#) – Aggregate OECD universe										
English common law	7.32	18.39	65.56	119.74	152.57	169.90	184.70	185.37	192.56	191.95
Scandinavian civil code law	1.43	6.16	17.15	16.96	14.71	10.03	6.92	6.27	5.88	5.33
French civil code law	30.81	32.08	41.39	28.19	16.91	10.61	7.30	7.59	4.39	5.72
German civil code law	181.04	150.93	70.12	26.92	12.72	6.01	2.07	2.36	0.96	0.36
North America	2.01	7.69	34.67	82.14	103.83	114.56	134.03	134.81	139.99	145.45
Developed Europe	13.05	40.46	106.72	95.41	80.24	75.27	57.51	54.14	49.51	41.25
Australasia	0.00	2.07	10.18	13.53	19.03	16.77	16.38	19.07	18.59	20.74
Scandinavia	1.43	6.16	17.15	16.96	14.71	10.03	6.92	6.27	5.88	5.33
Asia	157.73	125.36	44.90	14.14	3.76	0.76	0.06	0.12	0.00	0.00
Latin America	18.74	9.84	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emerging Europe	6.67	8.29	5.27	1.18	0.54	0.18	0.06	0.00	0.00	0.00
Middle East & Africa	16.58	7.36	2.18	0.66	0.32	0.00	0.00	0.00	0.00	0.00
Total	216.32	207.74	207.35	207.18	207.72	207.54	208.04	208.13	208.09	207.44
Panel 2: Stock count (#) – US-only universe										
S&P 500	22.59	20.08	29.63	36.31	38.81	43.68	49.06	48.19	55.12	56.07
S&P 400	26.30	31.15	24.07	28.90	22.85	21.93	21.04	20.48	17.13	15.10
S&P 600	35.32	24.91	22.46	11.00	14.49	10.66	6.29	7.67	4.22	4.27
Total	84.21	76.14	76.16	76.21	76.14	76.26	76.40	76.35	76.48	75.45

Panel 3: Summary statistics – Aggregate OECD market universe	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Returns – equal weight, %	1.0783	1.0509	1.1385	1.2255	1.2258	1.2860	1.1936	1.0612	0.7802	1.2698
Returns – value weight, %	0.2123*	0.1377	0.2436	0.0087	0.6190	-0.3496	1.0704	-0.1423	-0.4529	0.1647
Momentum	0.0704	0.0382	0.0583	0.0660	0.0717	0.0661	0.0667	0.0628	0.0591	0.0595
Liu Illiquidity (1 year)	14.58**	13.81	12.26	11.52	11.20	11.19	10.31	10.68	9.53	9.52
Traded volume (shares millions)	54.93**	74.04	44.50	40.98	52.69	59.69	57.33	61.78	85.87	137.17
Market Cap. (US\$ billions)	75.74**	40.67	30.97	39.17	41.14	10.40	11.80	18.26	19.41	41.50
Daily zero returns per month (%)	10.00**	9.42	10.78	11.38	12.97	15.62	16.63	17.52	19.42	22.24
Price (mean month, US\$)	404.99**	101.76	246.31	157.33	147.97	57.81	40.93	39.52	37.50	42.46
Book to Market value ratio	0.7227**	0.7648	0.8774	0.8809	0.9370	0.9738	0.9598	0.8539	0.7060	0.9455
Free Float (%)	66.52**	69.33	67.19	66.26	67.47	70.10	70.65	72.43	74.33	76.03
Investor Protection metric	5,096.93**	5,614.14	5,625.66	5,600.26	5,699.86	5,958.42	5,930.22	6,124.00	6,273.72	6,475.82
Firm governance index	11.30**	15.29	18.35	20.60	22.21	23.49	24.77	25.52	26.85	28.53
Governance metric	844.02**	1,241.94	1,548.55	1,761.24	1,903.70	2,024.05	2,124.88	2,200.66	2,316.84	2,474.15
Panel 4: Summary statistics – US only universe	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
Returns – equal weight (%)	1.2358†	1.3401	1.2036	1.3398	1.0618	0.9857	1.0521	1.0258	0.9850	1.0665
Returns – value weight (%)	0.1032*	0.9682	0.4755	0.7787	0.4494	0.3199	0.4136	0.0721	0.5747	0.0824
Momentum	0.0727	0.0758	0.0729	0.0752	0.0615	0.0547	0.0545	0.0565	0.0535	0.0607
Liu Illiquidity (1 year)	11.05**	10.29	10.01	10.12	10.29	9.59	9.50	9.46	9.25	9.28
Traded volume (shares millions)	22.56**	26.49	39.49	50.44	43.77	41.39	62.26	68.23	82.23	126.50
Market Cap. (US\$ billions)	3.13**	3.70	3.93	5.59	5.62	7.00	8.84	36.68	39.42	50.17
Daily zero returns per month (%)	14.99**	15.73	20.27	21.84	23.50	25.72	29.67	28.38	33.56	35.16
Price (mean month, US\$)	35.48**	39.56	40.83	44.45	41.57	45.24	44.90	51.77	49.60	51.66
Book to Market value ratio	0.8991**	1.0643	1.3093	1.5774	1.0580	1.6600	0.9381	-0.2490	1.7222	1.2830
Free Float (%)	66.23**	69.08	69.11	70.44	70.53	70.26	72.02	72.54	74.44	75.25
Investor Protection metric	5,288.42**	5,557.82	5,583.84	5,691.20	5,691.98	5,653.38	5,848.10	5,859.19	6,069.92	6,136.87
Firm governance index	21.13**	23.21	24.23	25.00	25.76	26.28	27.10	27.77	28.62	30.10
Governance metric	1,722.98**	1,905.19	1,994.02	2,066.02	2,135.42	2,184.71	2,256.31	2,318.26	2,395.57	2,528.22

Table 6 Empirical results for 10 governance (1 year rank and holding period) decile portfolios – for all three universes

This table reports the beta coefficients for valuation factors with t-statistics, explanatory power (R^2) and standard errors for the Fama and French (1993), three factor model (size and book to market value), FF3F- the Carhart (1997), - four factor model (size, book to market value and momentum),- Cahart4F- the Liu (2006) two factor liquidity model-Liquidity 2F, Investor Protection 2F, Governance 2F, Governance 2F using Protection deciles. In modelling returns of 10 liquidity sorted quintile portfolios (single-pass stock sorting following Liu, 2006). 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). D1 is the lowest illiquidity and D10 the highest. These portfolios are formed from annual rebalancing using the liquidity metric. 10 year US Treasury yield is used as the risk free rate. HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000). Numbers in square brackets are t-statistics. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low) Equal	D2 Equal	D3 Equal	D4 Equal	D5 Equal	D6 Equal	D7 Equal	D8 Equal	D9 Equal	D10 (High) Equal	D1 - D10 Equal	D1 - D10 Value
Weighting:												
Panel 1: Aggregate OECD universe												
Panel 1: Governance 2F(1y)												
Alpha (%)	-0.002 [-1.07]	-0.007 [-4.27]	-0.004 [-2.14]	-0.002 [-1.57]	-0.001 [-1.53]	-0.001 [-1.42]	-0.001 [-1.18]	-0.003 [-2.03]	-0.003 [-1.86]	-0.002 [-1.07]	---	---
Beta: Market (excess return)	0.942 [32.27]	0.974 [27.01]	1.016 [24.74]	1.011 [28.16]	1.045 [54.66]	0.998 [41.10]	0.974 [63.46]	1.062 [46.29]	0.982 [35.01]	0.942 [32.27]	---	---
Beta: Governance	0.700 [21.72]	0.347 [6.07]	0.098 [2.89]	-0.086 [-2.15]	-0.146 [-4.21]	-0.181 [-4.69]	-0.194 [-6.56]	-0.236 [-7.36]	-0.217 [-8.12]	-0.300 [-9.30]	---	---
Adjusted R ²	0.9477	0.8771	0.9169	0.9241	0.9432	0.9358	0.9430	0.9484	0.9413	0.9406	---	---
Panel 1: Investor Protection 2F(1y)												
Alpha (%)	-0.001 [-0.37]	-0.006 [-4.26]	-0.004 [-2.84]	-0.002 [-1.66]	-0.002 [-1.57]	-0.002 [-1.41]	-0.001 [-1.24]	-0.003 [-2.98]	-0.003 [-2.79]	-0.002 [-1.95]	0.002 [1.73]**	-0.004 [-1.91]**
Beta: Market (excess return)	0.939 [21.97]	0.974 [21.71]	1.015 [24.57]	1.011 [27.64]	1.045 [53.06]	0.997 [40.09]	0.973 [61.31]	1.061 [48.47]	0.982 [36.57]	0.942 [30.13]	-0.003 [-0.06]	0.301 [3.40]
Beta: Investor Protect	0.053 [0.66]	0.126 [1.95]	0.011 [0.19]	-0.016 [-0.31]	-0.045 [-1.07]	-0.125 [-2.60]	-0.141 [-3.21]	-0.154 [-3.51]	-0.108 [-2.67]	-0.130 [-2.66]	0.184 [1.70]	0.150 [0.71]
Adjusted R ²	0.7891	0.8421	0.9139	0.9218	0.9371	0.9286	0.9347	0.9368	0.9279	0.9119	0.0142	0.0520
Panel 1: Liquidity 2F(1y)												
Alpha (%)	-0.001 [-0.04]	-0.004 [-2.60]	-0.001 [-1.05]	0.001 [0.11]	0.001 [0.89]	-0.001 [-0.42]	-0.001 [-0.31]	-0.002 [-1.76]	-0.002 [-1.80]	-0.001 [-1.14]	0.001 [1.60]*	-0.007 [-1.63]*
Beta: Market (excess return)	0.929 [20.51]	0.943 [20.99]	0.976 [25.87]	0.967 [31.71]	0.999 [59.97]	0.974 [39.01]	0.953 [63.36]	1.034 [49.06]	0.959 [37.41]	0.922 [28.97]	0.006 [0.13]	0.368 [4.04]
Beta: Liquidity	0.036 [0.81]	0.105 [1.96]	0.145 [3.19]	0.161 [3.74]	0.171 [5.29]	0.091 [3.46]	0.080 [2.80]	0.109 [2.91]	0.088 [2.55]	0.078 [2.29]	-0.042 [-0.71]	-0.253 [-1.45]
Adjusted R ²	0.789	0.8428	0.9221	0.932	0.9477	0.9282	0.9324	0.9361	0.9282	0.9101	0.0079	0.0666
Panel 1: Carhart 4F												

Alpha (%)	0.001	-0.005	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.001	0.001	-0.002
	[0.01]	[-2.87]	[-1.32]	[-0.07]	[-0.47]	[-0.44]	[-1.04]	[-1.39]	[-1.63]	[-0.74]	[1.34] †	[-1.46] †
Beta: Market (excess return)	0.958	0.948	0.991	1.004	1.041	1.001	0.977	1.049	0.971	0.926	0.032	0.323
	[18.56]	[17.52]	[23.00]	[25.88]	[50.60]	[34.80]	[47.34]	[46.77]	[37.96]	[34.81]	[0.57]	[3.48]
Beta: SMB	-0.050	-0.045	-0.064	-0.106	-0.060	-0.064	-0.018	-0.084	-0.068	-0.086	0.036	-0.105
	[-1.01]	[-1.25]	[-1.75]	[-3.67]	[-2.06]	[-1.43]	[-0.58]	[-2.42]	[-2.06]	[-2.02]	[0.55]	[-0.84]
Beta: HML	0.012	-0.021	-0.007	-0.172	-0.123	-0.046	-0.027	-0.094	-0.074	-0.019	0.031	0.060
	[0.26]	[-0.41]	[-0.13]	[-4.65]	[-3.49]	[-0.84]	[-0.93]	[-1.93]	[-1.79]	[-0.39]	[0.40]	[0.45]
Beta: Momentum	-0.085	0.031	0.013	-0.008	0.004	-0.036	-0.009	0.002	0.002	-0.015	-0.070	-0.151
	[-1.87]	[0.72]	[0.56]	[-0.27]	[0.18]	[-1.12]	[-0.36]	[0.08]	[0.06]	[-0.41]	[-1.34]	[-1.20]
Adjusted R ²	0.7915	0.8390	0.9150	0.9350	0.9424	0.9266	0.9293	0.9363	0.9281	0.9095	0.0029	0.0512
Panel 1: FF3F												
Alpha (%)	-0.001	-0.005	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.001	0.001	-0.003
	[-0.20]	[-2.76]	[-1.28]	[-0.10]	[-0.44]	[-0.58]	[-1.10]	[-1.41]	[-1.65]	[-0.82]	[0.20]	[-1.61]*
Beta: Market (excess return)	0.935	0.956	0.994	1.002	1.042	0.990	0.974	1.049	0.972	0.922	0.013	0.282
	[21.08]	[19.73]	[23.50]	[26.91]	[52.17]	[32.91]	[49.57]	[46.62]	[33.22]	[33.82]	[0.28]	[3.09]
Beta: SMB	-0.009	-0.060	-0.070	-0.102	-0.062	-0.047	-0.014	-0.085	-0.069	-0.079	0.070	-0.032
	[-0.21]	[-1.71]	[-1.85]	[-3.37]	[-2.26]	[-1.13]	[-0.46]	[-2.41]	[-2.36]	[-2.01]	[1.21]	[-0.30]
Beta: HML	0.009	-0.020	-0.006	-0.172	-0.123	-0.047	-0.028	-0.094	-0.074	-0.019	0.028	0.054
	[0.19]	[-0.39]	[-0.12]	[-4.71]	[-3.51]	[-0.86]	[-0.94]	[-1.94]	[-1.82]	[-0.4]	[0.37]	[0.41]
Adjusted R ²	0.7874	0.8392	0.9153	0.9353	0.9426	0.9261	0.9296	0.9366	0.9284	0.9098	0.0086	0.0446
Panel 1: CAPM												
Alpha (%)	-0.001	-0.006	-0.004	-0.002	-0.002	-0.002	-0.001	-0.003	-0.003	-0.003	0.002	-0.004
	[-0.32]	[-4.04]	[-2.86]	[-1.74]	[-1.72]	[-1.75]	[-1.57]	[-3.39]	[-3.17]	[-2.21]	[0.87]	[-1.89]*
Beta: Market (excess return)	0.939	0.972	1.015	1.011	1.045	0.999	0.975	1.064	0.983	0.944	-0.005	0.299
	[22.08]	[21.58]	[24.63]	[27.84]	[53.99]	[38.9]	[59.06]	[46.83]	[35.53]	[28.83]	[-0.11]	[3.41]
Adjusted R ²	0.7895	0.8393	0.9143	0.9221	0.9369	0.9252	0.9299	0.9321	0.9254	0.9079	0.0005	0.0531
Panel 2: OECD (excl. US) universe												
Panel 2: Governance 2F(1y)												
Alpha (%)	-0.002	-0.006	-0.005	-0.004	-0.002	-0.001	-0.001	-0.001	-0.002	-0.002	-- --	-- --
	[-1.18]	[-1.71]	[-1.89]	[-1.54]	[-1.52]	[-0.06]	[-1.18]	[-1.03]	[-1.58]	[-1.18]		
Beta: Market (excess return)	1.000	0.944	0.969	1.018	0.951	1.001	1.052	1.073	1.009	1.000	-- --	-- --
	[38.65]	[21.42]	[22.48]	[18.07]	[20.8]	[27.65]	[55.93]	[28.59]	[38.64]	[38.65]		
Beta: Governance	0.702	0.328	0.158	0.052	-0.134	-0.167	-0.150	-0.150	-0.207	-0.298	-- --	-- --
	[21.65]	[5.43]	[2.75]	[1.56]	[-3.84]	[-5.15]	[-4.09]	[-3.65]	[-4.83]	[-9.20]		
Adjusted R ²	0.9386	0.8278	0.8438	0.8753	0.8889	0.9254	0.9278	0.9024	0.9199	0.9384	-- --	-- --

Panel 2: Investor Protection 2F (1y)												
Alpha (%)	0.001	-0.005	-0.005	-0.004	-0.003	0.001	-0.001	-0.001	-0.002	-0.003	0.003	-0.008
	[0.22]	[-2.67]	[-3.20]	[-2.39]	[-1.72]	[-0.22]	[-1.21]	[-1.08]	[-1.67]	[-2.36]	[1.29] †	[-1.69]**
Beta: Market (excess return)	0.959	0.934	0.954	1.012	0.951	0.992	1.040	1.058	0.993	0.992	-0.033	0.392
	[22.69]	[17.71]	[21.05]	[18.28]	[20.57]	[26.13]	[53.01]	[27.07]	[42.08]	[38.00]	[-0.72]	[4.02]
Beta: Investor Protect	0.122	0.143	-0.024	-0.018	-0.092	-0.197	-0.214	-0.240	-0.286	-0.281	0.403	0.596
	[1.62]	[1.52]	[-0.33]	[-0.24]	[-1.73]	[-4.10]	[-4.40]	[-3.44]	[-5.63]	[-6.23]	[4.49]	[2.78]
Adjusted R ²	0.7739	0.7917	0.8350	0.8745	0.8837	0.9221	0.9275	0.9038	0.9183	0.9207	0.0812	0.1086
Panel 2: Liquidity 2F (1y)												
Alpha (%)	0.002	-0.002	-0.003	-0.002	0.001	0.001	0.001	0.001	-0.001	-0.002	0.004	-0.007
	[1.95]	[-1.36]	[-1.70]	[-1.94]	[-0.02]	[1.09]	[1.35]	[0.06]	[-1.05]	[-1.34]	[1.41] †	[-1.43] †
Beta: Market (excess return)	0.924	0.882	0.924	0.973	0.915	0.979	1.030	1.050	1.004	0.997	-0.073	0.333
	[21.76]	[18.77]	[19.28]	[19.09]	[21.05]	[26.83]	[50.75]	[32.87]	[36.70]	[38.72]	[-1.49]	[3.60]
Beta: Liquidity	0.084	0.143	0.129	0.160	0.181	0.140	0.134	0.136	0.081	0.103	-0.018	-0.024
	[2.87]	[3.22]	[3.53]	[3.49]	[2.74]	[3.10]	[4.77]	[3.26]	[3.28]	[3.99]	[-0.45]	[-0.23]
Adjusted R ²	0.7760	0.8021	0.8459	0.8903	0.9050	0.9284	0.9311	0.9059	0.9094	0.9147	0.0058	0.064
Panel 2: Carhart 4F												
Alpha (%)	0.001	-0.003	-0.004	-0.002	-0.001	0.001	-0.001	0.001	-0.001	-0.002	0.002	-0.003
	[0.35]	[-1.86]	[-2.16]	[-0.87]	[-0.42]	[0.32]	[-0.97]	[0.24]	[-1.23]	[-1.32]	[1.97]**	[-1.74]**
Beta: Market (excess return)	0.981	0.909	0.946	0.971	0.934	1.009	1.058	1.059	1.013	1.000	-0.019	0.303
	[21.62]	[16.87]	[17.20]	[17.22]	[18.46]	[23.09]	[45.44]	[30.89]	[36.47]	[47.19]	[-0.41]	[3.42]
Beta: SMB	-0.041	-0.051	-0.03	-0.073	-0.089	-0.063	-0.025	-0.097	-0.035	-0.070	0.029	-0.148
	[-0.89]	[-1.33]	[-0.76]	[-2.03]	[-2.71]	[-1.71]	[-0.72]	[-2.78]	[-1.17]	[-2.16]	[1.55]	[-1.45]
Beta: HML	-0.085	-0.113	-0.011	-0.013	-0.027	-0.049	-0.062	-0.081	-0.073	0.004	-0.088	-0.061
	[-2.35]	[-2.21]	[-0.23]	[-0.28]	[-0.54]	[-0.93]	[-1.76]	[-1.91]	[-1.43]	[0.08]	[-1.37]	[-0.55]
Beta: Momentum	-0.100	0.015	0.006	0.054	0.005	-0.025	0.012	0.009	0.022	0.001	-0.101	-0.041
	[-2.07]	[0.32]	[0.15]	[1.29]	[0.11]	[-0.76]	[0.37]	[0.22]	[0.60]	[0.02]	[-1.88]	[-0.46]
Adjusted R ²	0.7785	0.7940	0.8339	0.8796	0.8862	0.9179	0.9219	0.9019	0.9079	0.9097	0.0307	0.0634
Panel 2: FF3F												
Alpha (%)	0.001	-0.003	-0.004	-0.002	-0.001	0.001	-0.001	0.001	-0.001	-0.002	0.002	-0.003
	[0.34]	[-1.85]	[-2.16]	[-0.86]	[-0.42]	[0.32]	[-0.96]	[0.24]	[-1.22]	[-1.32]	[1.94]**	[-1.75]**
Beta: Market (excess return)	0.957	0.913	0.947	0.984	0.935	1.003	1.061	1.061	1.019	1.000	-0.044	0.293
	[23.46]	[18.55]	[18.23]	[16.8]	[18.88]	[23.8]	[50.14]	[29.26]	[35.56]	[43.38]	[-1.00]	[3.47]
Beta: SMB	0.002	-0.058	-0.032	-0.097	-0.091	-0.052	-0.031	-0.101	-0.045	-0.070	0.073	-0.130
	[0.06]	[-1.54]	[-0.85]	[-2.68]	[-2.52]	[-1.36]	[-0.91]	[-2.92]	[-1.51]	[-1.91]	[1.62]	[-1.27]
Beta: HML	-0.091	-0.112	-0.011	-0.010	-0.027	-0.050	-0.062	-0.080	-0.071	0.004	-0.094	-0.064
	[-2.36]	[-2.21]	[-0.23]	[-0.22]	[-0.55]	[-0.96]	[-1.77]	[-1.94]	[-1.44]	[0.08]	[-1.48]	[-0.57]

Adjusted R ²	0.7739	0.7949	0.8347	0.8786	0.8868	0.9179	0.9222	0.9023	0.9081	0.9101	0.0184	0.0674
Panel 2: CAPM												
Alpha (%)	0.001	-0.004	-0.005	-0.004	-0.003	-0.001	-0.002	-0.002	-0.002	-0.003	0.004	-0.006
	[0.36]	[-2.44]	[-3.14]	[-2.38]	[-1.89]	[-0.58]	[-1.77]	[-1.55]	[-2.23]	[-2.83]	[1.57] †	[-1.44] †
Beta: Market (excess return)	0.946	0.919	0.956	1.014	0.961	1.014	1.063	1.084	1.025	1.023	-0.077	0.327
	[22.28]	[17.52]	[20.43]	[18.18]	[20.55]	[26.20]	[53.37]	[29.84]	[39.99]	[36.05]	[-1.64]	[3.54]
Adjusted R ²	0.7727	0.7893	0.8357	0.8751	0.8828	0.9161	0.9210	0.8962	0.9058	0.9085	0.0102	0.0684
Panel 3: US only universe												
Panel 3: Governance 2F(1y)												
Alpha (%)	-0.002	-0.001	-0.002	-0.001	-0.003	-0.004	-0.003	-0.003	-0.003	-0.002	-- --	-- --
	[-0.37]	[-1.05]	[-1.00]	[-0.76]	[-2.04]	[-3.32]	[-1.53]	[-1.40]	[-1.17]	[-0.37]		
Beta: Market (excess return)	0.892	0.991	0.955	0.962	0.947	0.983	0.963	0.933	0.862	0.892	-- --	-- --
	[42.90]	[47.73]	[36.53]	[32.30]	[30.14]	[45.39]	[26.20]	[30.62]	[27.85]	[42.9]		
Beta: Governance	0.465	0.178	0.173	0.076	-0.077	-0.234	-0.113	-0.141	-0.232	-0.535	-- --	-- --
	[6.58]	[1.49]	[2.00]	[0.81]	[-0.92]	[-3.18]	[-1.30]	[-2.05]	[-2.89]	[-7.56]		
Adjusted R ²	0.9355	0.9138	0.9198	0.9060	0.8978	0.9201	0.9090	0.9079	0.9019	0.9266	-- --	-- --
Panel 3: Investor Protection 2F (1y)												
Alpha (%)	-0.001	0.001	-0.001	0.001	-0.002	-0.004	-0.003	-0.003	-0.002	-0.002	0.001	0.001
	[-0.16]	[0.10]	[-1.03]	[0.17]	[-2.37]	[-3.98]	[-2.57]	[-2.35]	[-2.12]	[-1.34]	[1.99]*	[1.03]
Beta: Market (excess return)	0.877	0.947	0.921	0.929	0.906	0.948	0.942	0.891	0.816	0.832	0.045	0.104
	[30.32]	[34.76]	[34.80]	[29.55]	[23.46]	[29.62]	[22.16]	[25.03]	[20.30]	[19.87]	[1.06]	[0.76]
Beta: Investor Protect	0.191	0.233	0.187	0.157	0.148	0.078	0.055	0.132	0.123	0.094	0.096	0.461
	[3.95]	[4.61]	[3.76]	[2.03]	[2.03]	[1.46]	[1.13]	[2.09]	[2.14]	[1.24]	[1.46]	[2.16]
Adjusted R ²	0.9181	0.9213	0.9239	0.9105	0.9019	0.9153	0.9082	0.9095	0.8984	0.8900	0.0481	0.0621
Panel 3: Liquidity 2F (1y)												
Alpha (%)	-0.001	-0.001	-0.001	0.001	-0.003	-0.003	-0.003	-0.002	-0.002	-0.001	0.001	0.001
	[-1.41]	[-0.32]	[-0.18]	[1.82]	[-2.56]	[-3.59]	[-2.09]	[-1.78]	[-1.81]	[-0.88]	[1.40] †	[1.13]
Beta: Market (excess return)	0.912	0.990	0.934	0.943	0.936	0.954	0.949	0.906	0.833	0.838	0.074	0.166
	[35.69]	[45.13]	[39.37]	[37.49]	[30.36]	[34.38]	[23.08]	[27.69]	[22.60]	[23.65]	[2.08]	[1.63]
Beta: Liquidity	0.078	0.090	0.214	0.164	0.041	0.088	0.046	0.118	0.091	0.118	-0.040	0.338
	[1.98]	[2.00]	[6.14]	[3.60]	[0.65]	[2.35]	[0.89]	[3.49]	[2.12]	[2.72]	[-0.79]	[1.64]
Adjusted R ²	0.9121	0.9133	0.9334	0.9151	0.8977	0.9169	0.9083	0.9111	0.8982	0.8941	0.0358	0.0598
Panel 3: Carhart 4F												
Alpha (%)	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.004	-0.001	-0.010
	[2.72]	[3.05]	[0.79]	[0.39]	[0.71]	[0.02]	[0.24]	[1.23]	[2.30]	[4.30]	[-1.28] †	[-2.86]**

Beta: Market (excess return)	0.999 [36.60]	1.048 [46.02]	1.032 [51.29]	0.977 [27.50]	0.979 [36.11]	0.973 [39.64]	0.962 [33.52]	0.956 [41.18]	0.885 [34.08]	0.890 [38.68]	0.109 [2.94]	0.230 [2.32]
Beta: SMB	-0.281 [-6.18]	-0.243 [-4.89]	-0.254 [-6.15]	-0.108 [-1.52]	-0.198 [-3.55]	-0.247 [-5.68]	-0.178 [-4.80]	-0.272 [-4.80]	-0.288 [-6.49]	-0.363 [-8.02]	0.083 [1.45]	0.148 [0.56]
Beta: HML	-0.054 [-1.13]	0.068 [1.38]	-0.145 [-3.07]	-0.073 [-1.75]	0.168 [2.93]	0.108 [2.79]	0.183 [3.12]	0.117 [2.79]	0.120 [2.68]	0.130 [3.42]	-0.185 [-3.12]	-0.826 [-3.84]
Beta: Momentum	0.086 [2.97]	0.063 [2.22]	0.046 [2.63]	-0.020 [-0.49]	0.084 [3.26]	-0.006 [-0.20]	0.028 [1.17]	0.046 [1.46]	0.056 [2.91]	0.038 [1.39]	0.047 [1.75]	-0.169 [-2.64]
Adjusted R ²	0.9339	0.9258	0.9356	0.9095	0.9188	0.9329	0.9236	0.9288	0.9253	0.9329	0.1491	0.1757
Panel 3: FF3F												
Alpha (%)	0.002 [1.88]	0.002 [2.39]	0.001 [0.39]	0.001 [0.59]	0.001 [0.07]	0.001 [0.08]	0.001 [0.04]	0.001 [0.95]	0.002 [1.79]	0.004 [4.17]	-0.002 [-1.58] †	-0.008 [-2.40]**
Beta: Market (excess return)	0.952 [38.51]	1.013 [50.25]	1.007 [43.91]	0.988 [29.54]	0.933 [28.83]	0.976 [46.52]	0.946 [31.34]	0.931 [36.07]	0.854 [30.98]	0.870 [41.53]	0.083 [2.71]	0.323 [2.98]
Beta: SMB	-0.232 [-5.08]	-0.207 [-4.30]	-0.228 [-5.38]	-0.119 [-2.01]	-0.151 [-2.84]	-0.250 [-6.45]	-0.162 [-4.36]	-0.247 [-5.10]	-0.256 [-5.93]	-0.342 [-8.75]	0.110 [2.09]	0.052 [0.20]
Beta: HML	-0.053 [-1.01]	0.069 [1.34]	-0.144 [-3.18]	-0.074 [-1.69]	0.170 [2.81]	0.108 [2.79]	0.184 [2.99]	0.118 [2.7]	0.121 [2.46]	0.131 [3.50]	-0.184 [-2.99]	-0.830 [-3.69]
Adjusted R ²	0.9246	0.9217	0.9334	0.9095	0.9105	0.9332	0.9230	0.9265	0.9209	0.9310	0.1294	0.1525
Panel 3: CAPM												
Alpha (%)	-0.001 [-0.84]	-0.001 [-0.88]	-0.002 [-1.71]	-0.001 [-0.68]	-0.003 [-3.21]	-0.004 [-4.57]	-0.003 [-2.73]	-0.003 [-2.59]	-0.003 [-2.54]	-0.002 [-1.76]	0.001 [1.69]*	-0.002 [-1.41] †
Beta: Market (excess return)	0.923 [37.05]	1.003 [45.95]	0.966 [34.52]	0.967 [30.8]	0.942 [29.55]	0.967 [37.21]	0.956 [24.33]	0.924 [29.70]	0.846 [24.20]	0.855 [27.05]	0.068 [2.01]	0.216 [1.87]
Adjusted R ²	0.9101	0.9110	0.9169	0.9058	0.8976	0.9145	0.9080	0.9060	0.8948	0.8882	0.0355	0.0313

Table 7 Empirical results for 10 governance (1 year rank and holding period) decile portfolios – for all three universes

This table reports the beta coefficients for valuation factors with t-statistics, explanatory power (R^2) and standard errors for the two factor liquidity augmented CAPM models of Investor Protection 2F, Governance 2F, and Governance 2F using Protection deciles. 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). D1 is the lowest illiquidity and D10 the highest. Panels 1 and 2 reports estimation results based on decile portfolios formed from annual rebalancing using the new governance metric. Panel 3 reports estimations from deciles formed from similar annual rebalancing using the investor protection (ownership derivative) metric of Hearn et al (2017). HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000). Numbers in square brackets are t-statistics. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low) Equal	D2 Equal	D3 Equal	D4 Equal	D5 Equal	D6 Equal	D7 Equal	D8 Equal	D9 Equal	D10 (High) Equal	D1 - D10 Equal	D1 - D10 Value
Weighting:												
Panel 1: Investor Protection 2F(1y) using Governance deciles												
Panel 1: Aggregate OECD												
Alpha (%)	-0.001 [-0.37]	-0.006 [-4.26]	-0.004 [-2.84]	-0.002 [-1.66]	-0.002 [-1.57]	-0.002 [-1.41]	-0.001 [-1.24]	-0.003 [-2.98]	-0.003 [-2.79]	-0.002 [-1.95]	0.002 [1.73]**	-0.004 [-1.91]**
Beta: Market (excess return)	0.939 [21.97]	0.974 [21.71]	1.015 [24.57]	1.011 [27.64]	1.045 [53.06]	0.997 [40.09]	0.973 [61.31]	1.061 [48.47]	0.982 [36.57]	0.942 [30.13]	-0.003 [-0.06]	0.301 [3.40]
Beta: Investor Protect	0.053 [0.66]	0.126 [1.95]	0.011 [0.19]	-0.016 [-0.31]	-0.045 [-1.07]	-0.125 [-2.60]	-0.141 [-3.21]	-0.154 [-3.51]	-0.108 [-2.67]	-0.130 [-2.66]	0.184 [1.70]	0.150 [0.71]
Adjusted R ²	0.7891	0.8421	0.9139	0.9218	0.9371	0.9286	0.9347	0.9368	0.9279	0.9119	0.0142	0.0520
Panel 1: OECD (excl. US)												
Alpha (%)	0.001 [0.22]	-0.005 [-2.67]	-0.005 [-3.20]	-0.004 [-2.39]	-0.003 [-1.72]	0.001 [-0.22]	-0.001 [-1.21]	-0.001 [-1.08]	-0.002 [-1.67]	-0.003 [-2.36]	0.003 [1.29] †	-0.008 [-1.69]**
Beta: Market (excess return)	0.959 [22.69]	0.934 [17.71]	0.954 [21.05]	1.012 [18.28]	0.951 [20.57]	0.992 [26.13]	1.040 [53.01]	1.058 [27.07]	0.993 [42.08]	0.992 [38.00]	-0.033 [-0.72]	0.392 [4.02]
Beta: Investor Protect	0.122 [1.62]	0.143 [1.52]	-0.024 [-0.33]	-0.018 [-0.24]	-0.092 [-1.73]	-0.197 [-4.10]	-0.214 [-4.40]	-0.240 [-3.44]	-0.286 [-5.63]	-0.281 [-6.23]	0.403 [4.49]	0.596 [2.78]
Adjusted R ²	0.7739	0.7917	0.8350	0.8745	0.8837	0.9221	0.9275	0.9038	0.9183	0.9207	0.0812	0.1086
Panel 1: US only												
Alpha (%)	-0.001 [-0.16]	0.001 [0.10]	-0.001 [-1.03]	0.001 [0.17]	-0.002 [-2.37]	-0.004 [-3.98]	-0.003 [-2.57]	-0.003 [-2.35]	-0.002 [-2.12]	-0.002 [-1.34]	0.001 [1.99]*	0.001 [1.03]
Beta: Market (excess return)	0.877 [30.32]	0.947 [34.76]	0.921 [34.80]	0.929 [29.55]	0.906 [23.46]	0.948 [29.62]	0.942 [22.16]	0.891 [25.03]	0.816 [20.30]	0.832 [19.87]	0.045 [1.06]	0.104 [0.76]
Beta: Investor Protect	0.191 [3.95]	0.233 [4.61]	0.187 [3.76]	0.157 [2.03]	0.148 [2.03]	0.078 [1.46]	0.055 [1.13]	0.132 [2.09]	0.123 [2.14]	0.094 [1.24]	0.096 [1.46]	0.461 [2.16]
Adjusted R ²	0.9181	0.9213	0.9239	0.9105	0.9019	0.9153	0.9082	0.9095	0.8984	0.8900	0.0481	0.0621

Panel 2: Governance 2F(1y) using Governance deciles

Panel 2: Aggregate OECD

Alpha (%)	-0.002	-0.007	-0.004	-0.002	-0.001	-0.001	-0.001	-0.003	-0.003	-0.002	-- --	-- --
	[-1.07]	[-4.27]	[-2.14]	[-1.57]	[-1.53]	[-1.42]	[-1.18]	[-2.03]	[-1.86]	[-1.07]		
Beta: Market (excess return)	0.942	0.974	1.016	1.011	1.045	0.998	0.974	1.062	0.982	0.942	-- --	-- --
	[32.27]	[27.01]	[24.74]	[28.16]	[54.66]	[41.10]	[63.46]	[46.29]	[35.01]	[32.27]		
Beta: Governance	0.700	0.347	0.098	-0.086	-0.146	-0.181	-0.194	-0.236	-0.217	-0.300	-- --	-- --
	[21.72]	[6.07]	[2.89]	[-2.15]	[-4.21]	[-4.69]	[-6.56]	[-7.36]	[-8.12]	[-9.30]		
Adjusted R ²	0.9477	0.8771	0.9169	0.9241	0.9432	0.9358	0.9430	0.9484	0.9413	0.9406	-- --	-- --

Panel 2: OECD (excl. US)

Alpha (%)	-0.002	-0.006	-0.005	-0.004	-0.002	-0.001	-0.001	-0.001	-0.002	-0.002	-- --	-- --
	[-1.18]	[-1.71]	[-1.89]	[-1.54]	[-1.52]	[-0.06]	[-1.18]	[-1.03]	[-1.58]	[-1.18]		
Beta: Market (excess return)	1.000	0.944	0.969	1.018	0.951	1.001	1.052	1.073	1.009	1.000	-- --	-- --
	[38.65]	[21.42]	[22.48]	[18.07]	[20.8]	[27.65]	[55.93]	[28.59]	[38.64]	[38.65]		
Beta: Governance	0.702	0.328	0.158	0.052	-0.134	-0.167	-0.150	-0.150	-0.207	-0.298	-- --	-- --
	[21.65]	[5.43]	[2.75]	[1.56]	[-3.84]	[-5.15]	[-4.09]	[-3.65]	[-4.83]	[-9.20]		
Adjusted R ²	0.9386	0.8278	0.8438	0.8753	0.8889	0.9254	0.9278	0.9024	0.9199	0.9384	-- --	-- --

Panel 2: US only

Alpha (%)	-0.002	-0.001	-0.002	-0.001	-0.003	-0.004	-0.003	-0.003	-0.003	-0.002	-- --	-- --
	[-0.37]	[-1.05]	[-1.00]	[-0.76]	[-2.04]	[-3.32]	[-1.53]	[-1.40]	[-1.17]	[-0.37]		
Beta: Market (excess return)	0.892	0.991	0.955	0.962	0.947	0.983	0.963	0.933	0.862	0.892	-- --	-- --
	[42.90]	[47.73]	[36.53]	[32.30]	[30.14]	[45.39]	[26.20]	[30.62]	[27.85]	[42.9]		
Beta: Governance	0.465	0.178	0.173	0.076	-0.077	-0.234	-0.113	-0.141	-0.232	-0.535	-- --	-- --
	[6.58]	[1.49]	[2.00]	[0.81]	[-0.92]	[-3.18]	[-1.30]	[-2.05]	[-2.89]	[-7.56]		
Adjusted R ²	0.9355	0.9138	0.9198	0.9060	0.8978	0.9201	0.9090	0.9079	0.9019	0.9266	-- --	-- --

Panel 3: Governance 2F(1y) using Investor Protection deciles**Panel 3: Aggregate OECD**

Alpha (%)	-0.002	-0.001	-0.001	-0.001	0.001	-0.001	0.001	-0.001	0.001	-0.001	0.001	-0.004
	[-0.90]	[-0.52]	[-1.59] †	[-0.11]	[0.14]	[-0.24]	[0.92]	[-0.05]	[0.01]	[-0.51]	[0.84]	[-0.42]
Beta: Market (excess return)	0.922	1.084	1.046	1.048	1.016	0.972	0.918	0.893	0.906	1.077	-0.014	-0.152
	[19.42]	[57.65]	[64.88]	[49.63]	[54.83]	[67.72]	[62.56]	[46.44]	[44.45]	[53.82]	[-0.34]	[-0.66]
Beta: Governance	0.137	0.101	0.034	-0.063	-0.137	-0.136	-0.073	0.040	0.086	-0.001	0.131	0.726
	[1.78]*	[2.08]*	[1.16]	[-2.48]*	[-4.77]**	[-4.76]**	[-2.11]*	[1.18]	[2.34]**	[-0.02]	[2.40]*	[1.37] †
Adjusted R ²	0.7834	0.8414	0.9702	0.9538	0.9602	0.9613	0.9502	0.9311	0.9357	0.946	0.015	0.018

Panel 3: OECD (excl. US)

Alpha (%)	0.002	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	0.001	0.002	-0.001
	[1.46] †	[0.59]	[0.60]	[-1.76]*	[-0.07]	[-0.91]	[-0.20]	[-2.00]*	[-1.36] †	[0.10]	[0.99]	[-0.08]

Beta: Market (excess return)	0.968 [46.51]	1.173 [24.49]	1.038 [35.31]	1.070 [62.64]	0.999 [61.85]	1.009 [73.03]	0.897 [36.64]	0.869 [37.55]	0.967 [56.69]	1.063 [55.64]	-0.095 [-3.86]	0.093 [0.58]
Beta: Governance	0.012 [0.32]	-0.022 [-0.57]	-0.026 [-0.71]	0.044 [1.77]*	-0.034 [-2.62]**	-0.010 [-0.57]	0.068 [2.08]*	0.156 [3.81]**	0.012 [0.45]	-0.178 [-6.35]**	0.190 [4.19]**	0.236 [0.82]
Adjusted R ²	0.9015	0.8624	0.7572	0.9667	0.9708	0.9769	0.9203	0.888	0.9523	0.9478	0.1248	0.0061
Panel 3: US only												
Alpha (%)	-0.001 [-1.14]	0.001 [0.07]	-0.001 [-1.56] †	-0.001 [-1.97]*	-0.002 [-3.19]**	-0.001 [-1.27]	-0.001 [-1.90]*	0.001 [0.08]	0.002 [1.70]*	0.005 [2.56]**	-0.006 [-2.33]**	0.010 [1.88]*
Beta: Market (excess return)	1.106 [51.34]	1.078 [27.71]	1.044 [59.86]	1.061 [84.71]	1.012 [56.63]	0.975 [33.76]	1.007 [64.73]	0.944 [61.03]	0.919 [33.33]	0.875 [26.06]	0.231 [4.95]	-0.309 [-2.63]
Beta: Governance	0.043 [0.69]	0.033 [0.59]	0.006 [0.14]	0.016 [0.38]	0.011 [0.27]	-0.020 [-0.36]	0.083 [1.90]*	-0.101 [-2.08]*	0.049 [0.62]	-0.144 [-1.69]*	0.187 [1.53] †	0.522 [1.89]*
Adjusted R ²	0.959	0.8387	0.9694	0.9747	0.9634	0.9515	0.971	0.9581	0.8997	0.8572	0.2225	0.0784

Table 8 Time varying parameter model tests of CAPM-type and multifactor models using monthly excess returns for decile size, book-to-market value, investor protection and governance-sorted portfolios with annual rebalancing for the period January 2001 – September 2017

This table reports the average time varying alpha terms, proportions of the sample for which the lower standard error band is negative (that is, where the alpha lacks statistical significance) and proportions of testing asset portfolios (deciles portfolios) where convergence is achieved. Time-varying parameter Kalman filter CAPM-type and multifactor CAPM-based models are used where these are based on CAPM, three factor Fama and French (1993) Size and Book-to-Market augmented CAPM, Liu (2006) two factor liquidity-augmented CAPM and the two factor investor protection augmented CAPM. 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). < denotes the largest negative value of each of the three information criterion (that is the model of choice)

	Time series		Information criterion			%		Time series		Information criterion			%
	Mean alpha	% SE (alpha) negative	SBC	HQC	AIC	Converge		Mean alpha	% SE (alpha) negative	SBC	HQC	AIC	Converge
Panel 1: Aggregate OECD	Size decile portfolios							Book-to-Market decile portfolios					
CAPM	-0.00077	58.35%	-5.44	-5.41	-5.43	90.00%		-0.00064	68.44%	-5.59	-5.56	-5.58	100.00%
FF3F	-0.00281	45.15%	-5.56	-5.49	-5.53	40.00%		-0.00050	73.23%	-5.72	-5.65	-5.69	50.00%
Carhart 4F	-0.00145	80.32%	-5.35	-5.26	-5.31	50.00%		0.00061	77.35%	-5.72	-5.65	-5.69	50.00%
Liquidity 2F (1yr)	-0.00030	70.54%	-5.51	-5.46	-5.49	80.00%		-0.00009	73.33%	-5.71	-5.67	-5.69	100.00%
Investor Protect 2F (1yr)	-0.00079	67.20%	-5.46	-5.41	-5.44	70.00%		-0.00067	73.10%	-5.56	-5.51	-5.54	100.00%
Governance 2F (1yr)	-0.00079	66.35%	-5.62<	-5.57<	-5.60<	50.00%		-0.00050	72.29%	-5.81<	-5.76<	-5.79<	80.00%
	Investor Protection-1y decile portfolios							Governance-1y decile portfolios					
CAPM	-0.00008	51.05%	-5.15	-5.12	-5.14	80.00%		-0.00281	72.18%	-4.73	-4.70	-4.72	100.00%
FF3F	0.00009	69.31%	-5.18	-5.11	-5.15	30.00%		-0.00207	78.48%	-4.52	-4.45	-4.49	30.00%
Carhart 4F	-0.00035	76.19%	-5.19	-5.11	-5.16	30.00%		-0.00315	85.19%	-3.85	-3.76	-3.81	10.00%
Liquidity 2F (1yr)	-0.00017	67.45%	-5.13	-5.09	-5.12	100.00%		-0.00041	70.38%	-4.80	-4.76	-4.78	100.00%
Investor Protect 2F (1yr)	-0.00013	63.89%	-5.30<	-5.25<	-5.28<	40.00%		-0.00220	75.00%	-4.81	-4.76	-4.79	80.00%
Governance 2F (1yr)	-0.00037	68.56%	-5.18	-5.13	-5.16	70.00%		-0.00231	76.13%	-5.03<	-4.98<	-5.01<	90.00%
Panel 2: OECD exclude US	Size decile portfolios							Book-to-Market decile portfolios					
CAPM	-0.00077	64.47%	-5.11	-5.08	-5.10	100.00%		-0.00056	72.67%	-5.40	-5.36	-5.38	100.00%
FF3F	-0.00236	79.19%	-5.16	-5.10	-5.14	60.00%		-0.00174	85.45%	-5.39	-5.32	-5.36	20.00%
Carhart 4F	-0.00235	69.14%	-5.22	-5.13	-5.18	50.00%		-0.00088	69.66%	-5.69<	-5.61<	-5.66<	50.00%
Liquidity 2F (1yr)	-0.00049	74.73%	-5.05	-5.01	-5.03	70.00%		-0.00021	72.96%	-5.55	-5.50	-5.53	100.00%
Investor Protect 2F (1yr)	-0.00102	67.28%	-5.33	-5.28	-5.31	60.00%		-0.00024	72.66%	-5.37	-5.32	-5.35	60.00%
Governance 2F (1yr)	-0.00435	76.81%	-5.38<	-5.33<	-5.36<	60.00%		-0.00036	78.31%	-5.40	-5.35	-5.38	70.00%
	Investor Protection-1y decile portfolios							Governance-1y decile portfolios					
CAPM	-0.00018	68.07%	-4.79	-4.76	-4.78	90.00%		-0.00301	71.12%	-4.30	-4.27	-4.29	100.00%
FF3F	-0.00044	62.35%	-4.88	-4.82	-4.86	50.00%		-0.00120	73.17%	-4.24	-4.17	-4.21	70.00%
Carhart 4F	-0.00103	81.06%	-5.14<	-5.06	-5.10	50.00%		-0.00009	58.84%	-4.16	-4.08	-4.13	40.00%
Liquidity 2F (1yr)	-0.00007	67.57%	-5.12	-5.07<	-5.10<	100.00%		0.00022	64.23%	-4.55	-4.50	-4.53	90.00%

Investor Protect 2F (1yr)	-0.00039	58.94%	-4.91	-4.86	-4.89	40.00%	-0.00241	73.47%	-4.31	-4.26	-4.29	70.00%
Governance 2F (1yr)	-0.00034	71.75%	-4.72	-4.68	-4.70	50.00%	-0.00288	81.07%	-4.59<	-4.54<	-4.57<	90.00%
Panel 3: US only	Size decile portfolios						Book-to-Market decile portfolios					
CAPM	-0.00123	66.73%	-4.87	-4.84	-4.86	100.00%	-0.00039	66.81%	-5.04	-5.00	-5.02	100.00%
FF3F	0.00006	72.77%	-4.81	-4.75	-4.79	70.00%	0.00018	76.19%	-5.05	-4.98	-5.02	80.00%
Carhart 4F	0.00028	74.71%	-4.81	-4.72	-4.77	50.00%	0.00029	81.14%	-5.10<	-5.02<	-5.07<	60.00%
Liquidity 2F (1yr)	-0.00050	72.31%	-4.10	-4.06	-4.09	60.00%	-0.00034	74.10%	-4.32	-4.28	-4.31	80.00%
Investor Protect 2F (1yr)	-0.00182	75.32%	-4.89	-4.84	-4.87	60.00%	0.00007	68.33%	-4.79	-4.74	-4.77	70.00%
Governance 2F (1yr)	-0.00131	72.56%	-4.96<	-4.91<	-4.94<	90.00%	-0.00008	71.60%	-4.97	-4.92	-4.95	90.00%
	Investor Protection-1y decile portfolios						Governance-1y decile portfolios					
CAPM	-0.00123	66.73%	-4.87	-4.84	-4.86	90.00%	-0.00162	67.55%	-4.65	-4.62	-4.64	100.00%
FF3F	0.00006	72.77%	-4.81	-4.75	-4.79	70.00%	0.00133	76.82%	-4.75	-4.68	-4.72	90.00%
Carhart 4F	0.00028	74.71%	-4.81	-4.72	-4.77	50.00%	0.00139	77.34%	-4.75	-4.67	-4.71	40.00%
Liquidity 2F (1yr)	-0.00050	72.31%	-4.10	-4.06	-4.09	60.00%	-0.00029	76.05%	-4.13	-4.09	-4.12	80.00%
Investor Protect 2F (1yr)	-0.00182	75.32%	-4.89	-4.84	-4.87	60.00%	-0.00011	74.61%	-4.68	-4.63	-4.66	80.00%
Governance 2F (1yr)	-0.00131	72.56%	-4.96<	-4.91<	-4.94<	90.00%	-0.00170	78.18%	-4.85<	-4.80<	-4.83<	90.00%

Figure 1

Global equity market firm sample by country and region, January 2000 to September 2017

The figure shows the distribution of sample stocks by country or region, with the sample size and percentage of the total for each. The sample selection criteria are described in the data section.

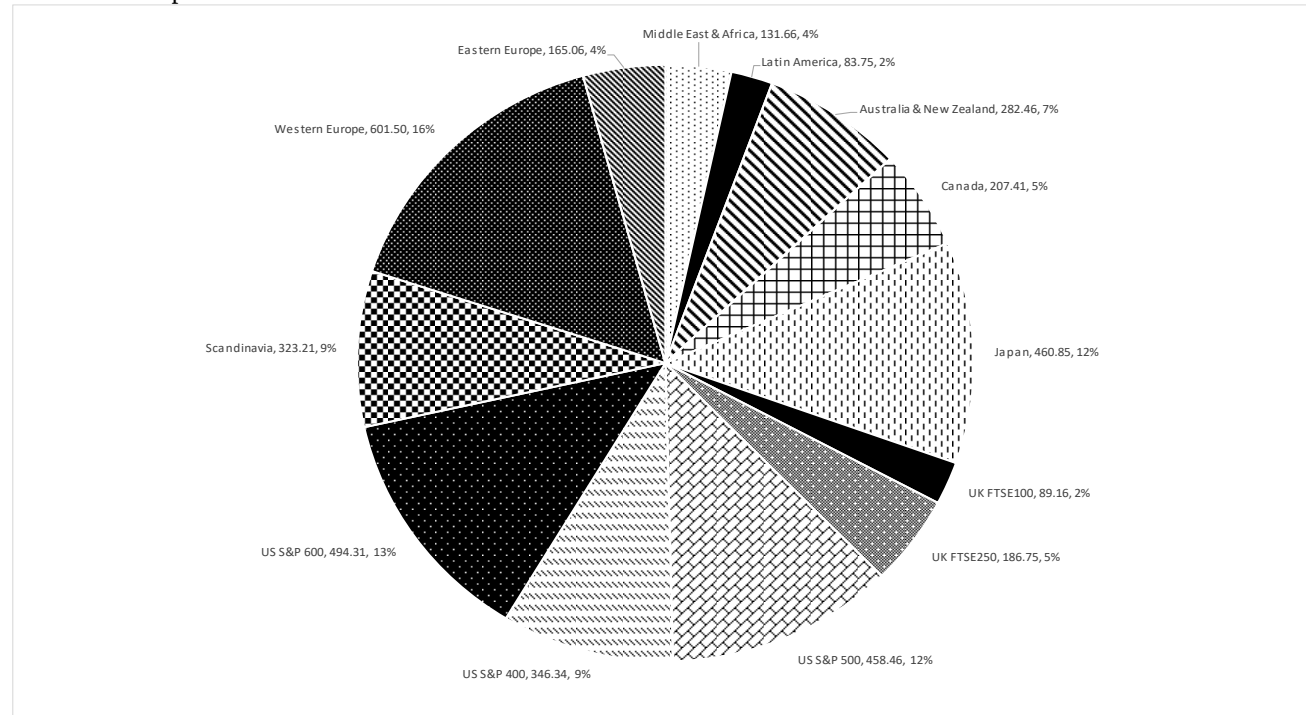


Figure 2

Global equity market firm sample by year, January 2000 to September 2017

The figure shows the distribution of sample stocks by region and month. The sample selection criteria are described in the data section.

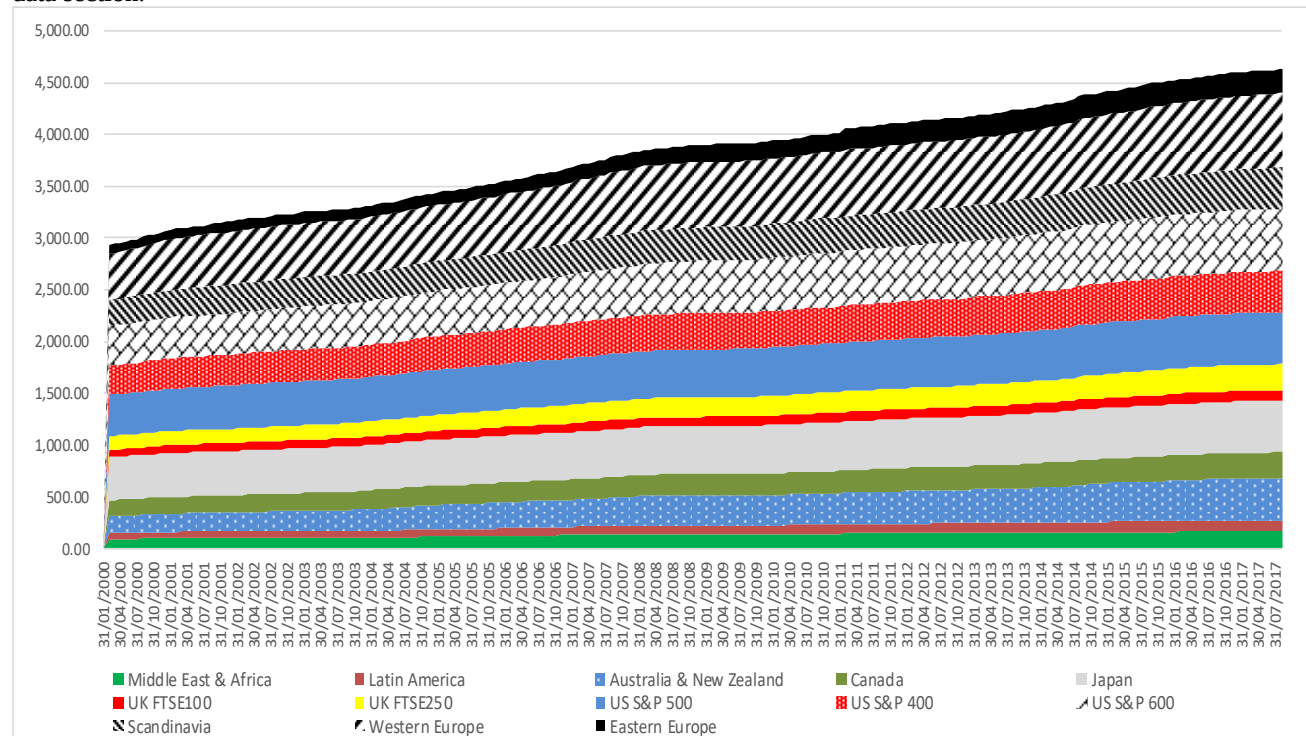


Figure 3

ASSET4 equity market firm sample by year, January 2002 to September 2017

The figure shows the distribution of sample stocks by region and month. The sample selection criteria are described in the data section.

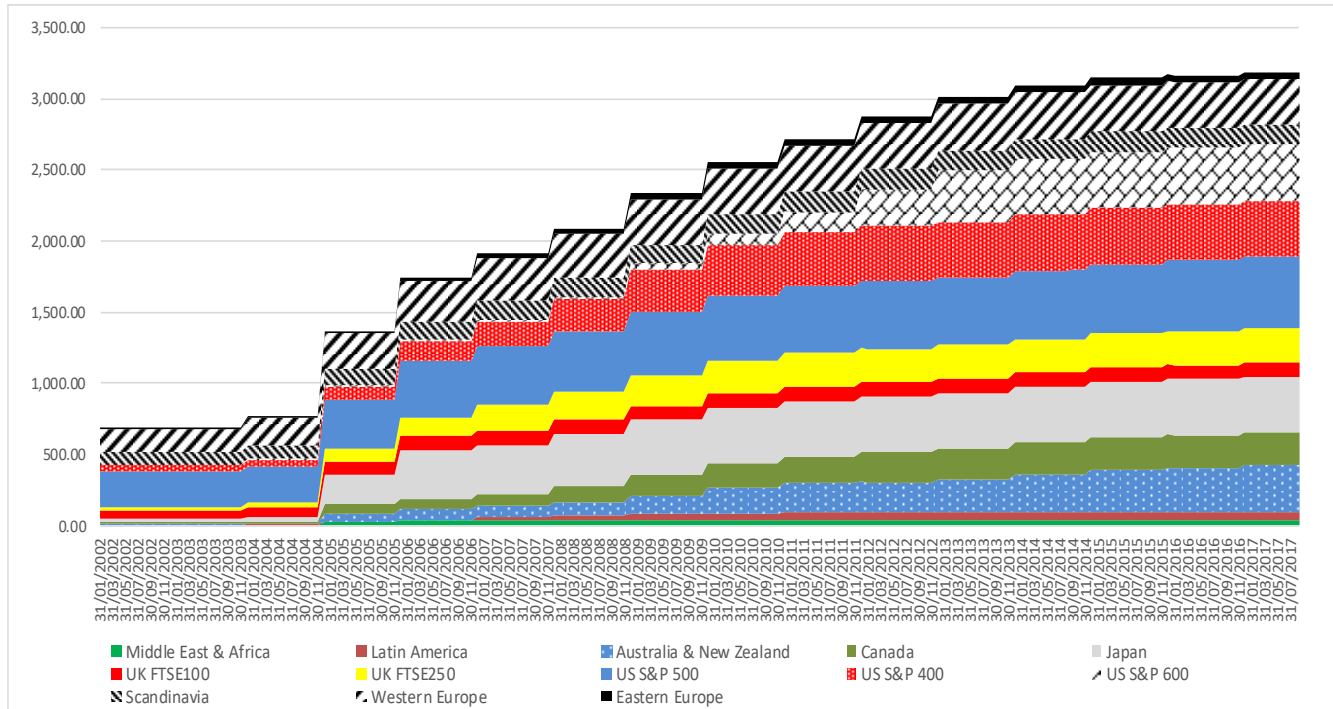


Figure 4

US universe time varying Governance beta (Gov2F) evolution for D1 of investor protection sorted decile portfolio for January 2002 to September 2017

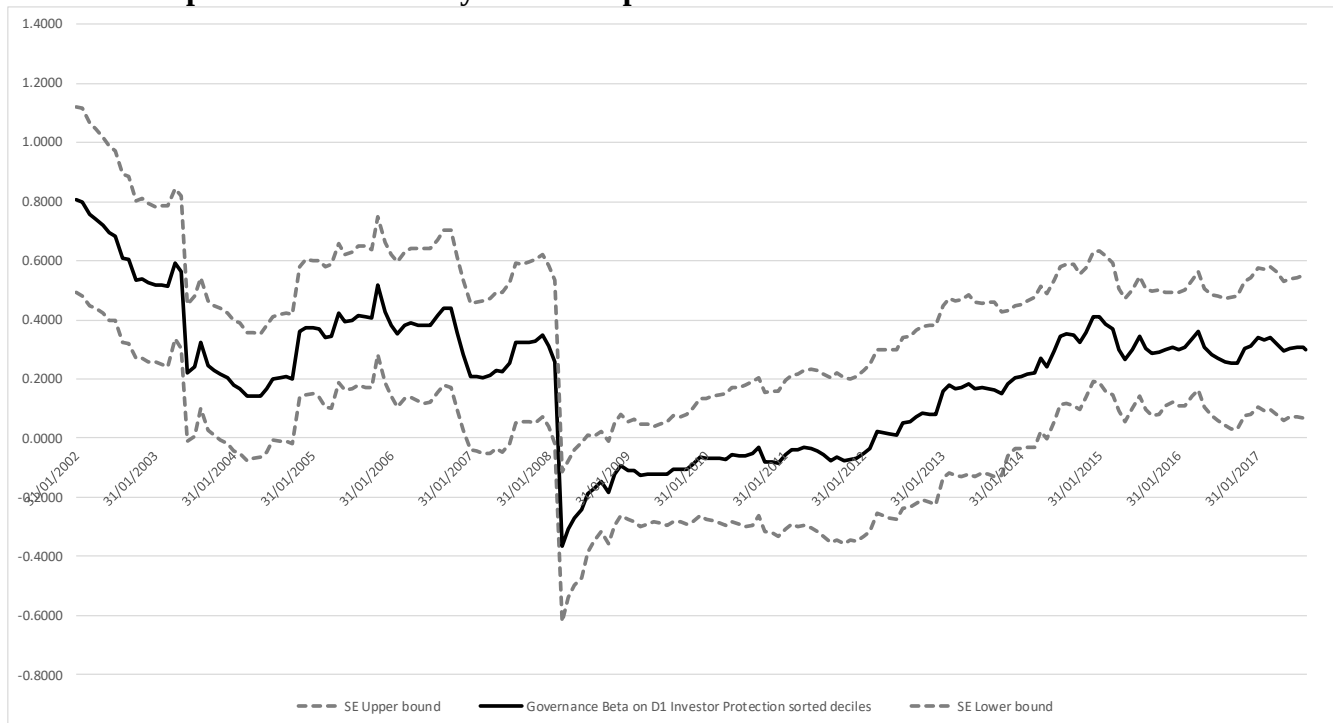
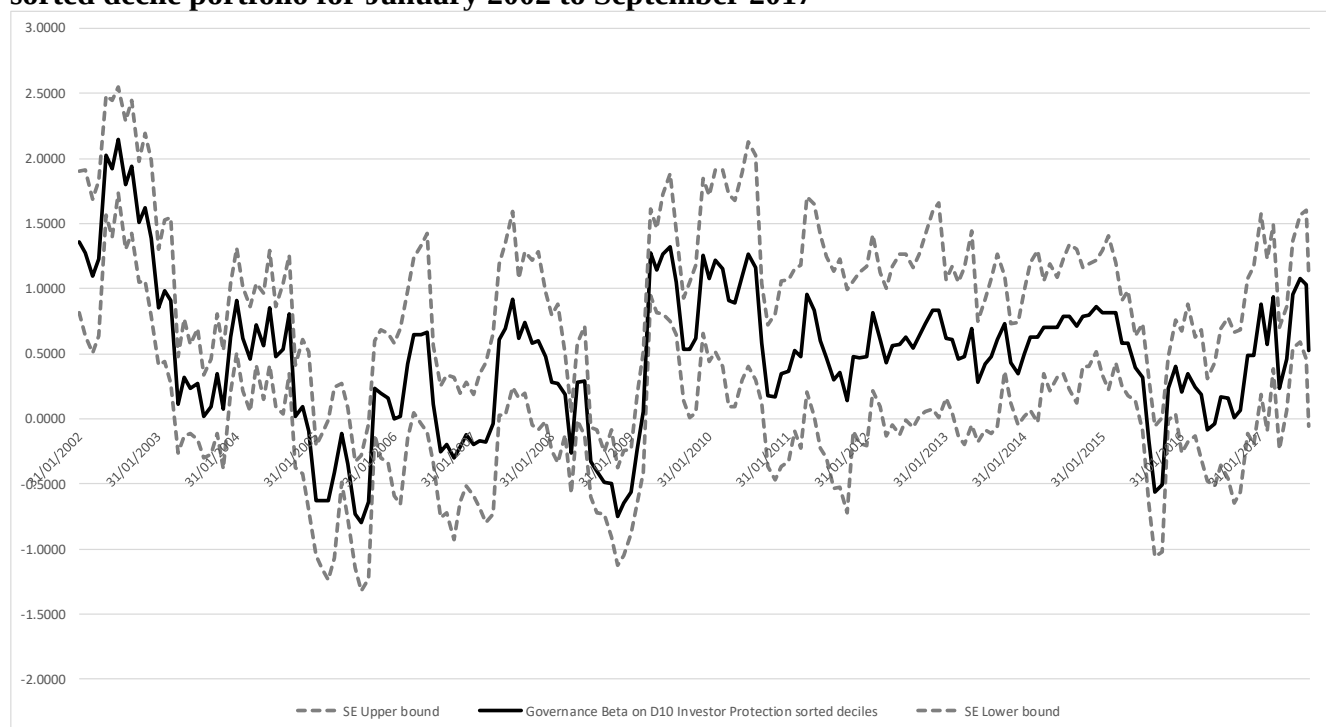


Figure 5

US universe time varying Governance beta (Gov2F) evolution for D10 of investor protection sorted decile portfolio for January 2002 to September 2017



Appendix A. Table 1A.

Datastream variable definitions

All data are from Datastream and Worldscope (accessed through Datastream)

Coverage	Index	Description	Datastream Mnemonic
Australia	S&P/ASX 300 [300]	Source: S&P/ASX	LASX300I
Austria	ATX Index [20]	Source: Wiener Bourse	LATXINDX
Belgium	BEL 20 [20]	Source: Belgium stock exchange	LBGBEL20
Canada	S&P/TSX Composite [248]	Source: S&P/TSX	LTTOCOMP
Chile	IPSA [40]	Source: Santiago stock exchange	LIPSASEL
Czech Republic	Prague SE PX Global [24]	Source: Prague stock exchange	LCZPXGLB
Denmark	OMX Copenhagen [135]	Source: Nasdaq OMX	LCOSEASH
Estonia	TRX Estonia All-Share [32]	Source: Thomson Datastream	LTR0EOXXD
Finland	OMX Helsinki [135]	Source: Nasdaq OMX	LHEXINDX
France	France CAC Large 60 [60]	Source: Euronext Paris	LFRCLR60
Germany	DJ DAX 100 [100]	Source: Deutsche Börse	LDAX100I0700
Greece	Athens Composite [60]	Source: Athens stock exchange	LGRAGENL
Hungary	Budapest (BUX) [14]	Source: Budapest stock exchange	LBUXINDX
Iceland	OMX Iceland All Share [16]	Source: Nasdaq OMX	LICEXALL
Ireland	ISEQ Overall [47]	Source: Irish stock exchange	LISEQUIT
Israel	Dow Jones Tel Aviv 100 [101]	Source: Israel stock exchange	LISTA100
Italy	All Stars [74]	Source: Milan Bourse	LMIBASTR
Japan	S&P TOPIX 500 [498]	Source: Japan stock exchange	LTSET500
Latvia	Latvia TRX All-Sector [67]	Source: Thomson Datastream	LTR0LVXXD
Luxembourg	Luxembourg SE LUXX [9]	Source: Luxembourg stock exchange	LLXLUXXI
Mexico	Indice Compuesto del Mercado Acciones [60]	Source: Mexican stock exchange	LMXIRTCM
Netherlands	All Share General [140]	Source: CBS	LCBSKGEN
New Zealand	S&P/NZX All Index [116]	Source: New Zealand stock exchange	LNZSEALL
Norway	Oslo OBX [25]	Source: Oslo Bors	LOSLOOBX
Poland	Warsaw General 20 [20]	Source: Warsaw stock exchange	LPOLWG20
Portugal	PSI All-Share [47]	Source: Euronext Lisbon	LPOPSIGN
Slovakia	DS Market Constituents SSX [50]	Source: Thomson Datastream	LTOTSX
Slovenia	Top stocks index [7]	Source: Ljubljana stock exchange	LSLOETOP
South Korea	KOSPI 100 [100]	Source: Korea stock exchange	LKOR100I
Spain	Madrid SE General [108]	Source: Bolsas y Mercados Españoles	LMADRIDI
Sweden	OMX Stockholm Benchmark [89]	Source: Nasdaq OMX	LSWEBENC
Switzerland	UBS100 [100]	Source: SWX Swiss stock exchange	LSBC100I
Turkey	BIST National 30 [30]	Source: Istanbul stock exchange	LTKNAT30
UK	Top 350 stocks		
UK	FTSE 100 [101]	Source: FTSE	LFTSE100
UK	FTSE 250 [251]	Source: FTSE	LFTSE250
US	S&P 1,500 constituents		
US S&P 500	S&P 500 [Large cap stocks] [500]	Source: S&P	LS&PCOMP
US S&P 400	S&P 400 [Mid cap stocks] [400]	Source: S&P	LS&PMIDC
US S&P 600	S&P 600 [Small cap stocks] [600]	Source: S&P	LS&P600I

Appendix B Table 1B.

Datastream variable and Worldwide governance indicator definitions

All data are from Datastream and Worldscoop (accessed through Datastream) with the exception of the six World Bank Governance indices, which are from <http://info.worldbank.org/governance/wgi/index.aspx#home>

Variable	Definition	Datastream Mnemonic
ASSET4-ESG Governance elements		
Minority rights		
Board diversity policy	Does the company have a policy regarding the diversity of its board? [Y/N]	CGBSDP0013
Adequate experience of board policy	Does the company have a policy regarding the adequate experience on its board? [Y/N]	CGBSDP0015
Board independence policy	Does the company have a policy regarding the independence of its board? [Y/N]	CGBSDP0012
Board size policy	Does the company have a policy regarding the size of its board? [Y/N]	CGBSDP0011
CEO board member	The CEO is a board member. [Y/N]	CGBSDP061
Chairman is ex-CEO	Has the chairman previously held the CEO position in the company? [Y/N]	CGBSDP040
Nomination committee	Does the company have a nomination committee? [Y/N]	CGBSDP005
Succession plan for executives	Does the company have a succession plan for executive management in the event of unforeseen circumstances? [Y/N]	CGBFDP030
Corporate governance committee	Does the company have a corporate governance committee? [Y/N]	CGBFDP005
External consultants	Does the board or board committees have the authority to hire external advisers or consultants without management's approval? [Y/N]	CGBFDP031
Golden parachute	Does the company have a golden parachute or other restrictive clauses related to changes of control (compensation plan for accelerated pay-out)? [Y/N]	CGSRDP055
Limitation of director liability	Does the company have a limitation of director liability? [Y/N]	CGSRDP063
Limitations on removal of directors	Are there limitations on the shareholders' right to remove board members (i.e., only for cause, supermajority vote required, etc.)? [Y/N]	CGSRDP071
Limited shareholder rights to call meetings	Has the company limited the rights of shareholders to call special meetings? [Y/N]	CGSRDP058
Majority requirements for election of directors	Are the company's board members elected with a majority vote? [Y/N]	CGSRDP033
Poison pill	Does the company have a poison pill (shareholder rights plan, macaroni defence, etc.)? [Y/N]	CGSRDP050
Voting		
Equal voting right policy	Does the company have a policy to apply the one-share, one-vote principle? [Y/N]	CGSRDP0011
Shareholder engagement policy	Does the company have a policy to facilitate shareholder engagement, resolutions or proposals? [Y/N]	CGSRDP0013
Pre-emptive rights	Does the company grant pre-emptive rights to existing shareholders?	CGSRDP060
Public availability corporate statutes	Are the company's articles of association, statutes or bylaws publicly available? [Y/N]	CGSRDP044
Advance notice for shareholder proposals	Does the company have deadlines relating to shareholder proposals? [Y/N]	CGSRDP072
Confidential voting policy	Does the company have a confidential voting policy (i.e., management cannot view the results of shareholder votes)? [Y/N]	CGSRDP062
Different share classes different rights	Does the company have different class stocks with different voting rights? [Y/N]	CGSRDP022
Elimination of cumulative voting rights	Has the company reduced or eliminated cumulative voting in regard to the election of board members? [Y/N]	CGSRDP059
Expanded constituency provision	Does the company have expanded-constituency provisions in	CGSRDP075

Fair price provision	place? [Y/N] Is the company subject to fair price provision, either under applicable law or as stated in the company documents (charter or bylaws)? [Y/N]	CGSRDP070
Min. number of shares to vote	Has the company set requirements for a minimum number of shares to vote? [Y/N]	CGSRDP028
Voting cap	Does the company have shares with a voting cap (ceilings) clause, ownership ceilings or control share acquisition provision? [Y/N]	CGSRDP026
Significant company transactions (M&A) shareholder's approval	Limitations to the shareholders right to approve significant company transitions such as M&As (no rights to vote or supermajority required)? [Y/N]	CGSRDP069
Supermajority vote requirements	Does the company have a supermajority vote requirement or qualified majority (for amendments of charters and bylaws or lock-in provisions)? [Y/N]	CGSRDP054
Written consent requirements	Does the company permit actions to be taken without meeting by written consent? [Y/N]	CGSRDP074
Integrated strategy in MD&A	Does the company explicitly integrate financial and extra-financial factors in its management discussion and analysis (MD&A) section in the annual report? [Y/N]	CGVSDP018
Delay		
Classified board structure	Does the company have a classified board structure? [Y/N]	CGSRDP052
Staggered board structure	Does the company have a staggered board structure? [Y/N]	CGSRDP053
Company cross shareholding	Does the company have significant cross shareholding that can prevent takeovers? [Y/N]	CGSRDP061
Golden share	Does the biggest owner (by voting power) hold the veto power or own golden shares? [Y/N]	CGSRDP048
Blank check	Does the company have unlimited authorized capital or a blank check?	CGSRDP051
State owned enterprise	Is the company a State Owned Enterprise (SOE)? [Y/N]	CGSRDP049
Director Incentives		
Shareholder's approval of stock based compensation Plan	Does the company require that shareholder approval is obtained prior to the adoption of any stock based compensation plans? [Y/N]	CGCPDP056
CEO compensation link to shareholder return	Is the CEO's compensation linked to total shareholder return (TSR)? [Y/N]	CGCPDP041
Compensation committee	Does the company have a compensation committee? [Y/N]	CGCPDP005
Compensation improvement tools	Does the company have the necessary internal improvement and information tools for the board members to develop appropriate compensation/remuneration to attract and retain key executives? [Y/N]	CGCPDP011
Executive retention compensation policy	Does the company have a compensation policy to attract and retain executives? [Y/N]	CGCPDP0014
Performance oriented compensation policy	Does the company have a performance oriented compensation policy? [Y/N]	CGCPDP0012
Shareholders vote on executive pay	Do the company's shareholders have the right to vote on executive compensation? [Y/N]	CGSRDP038
Datastream items		
Free Float Number of Shares	The percentage of total shares in issue available to ordinary investors (NOSHFF). That means total number of shares (NOSH) less the strategic holdings (NOSHST). In general, only holdings of 5% or more are counted as strategic. Strategic ownership data is collected by the Thomson Reuters Ownership team, the data is derived from 11 primary sources, including SEC filings (such as schedule 13D and form 13FD) and the UK Register. Also annual, interim reports, stock exchanges,	NOSHFF

	official regulatory bodies, third party vendors, company websites, approved news sources and direct contact with company investor relations departments Ownership updates were obtained at end of month prior to August 2009 while after this date values are updated on the 10th and 30th of each month Strategic holdings are defined as the sum of the following categories of shareholding: (1) Government: State (government) or state (government) institution (NOSHGV) (2) Cross Holdings: Holdings by one company in another (NOSHCO) (3) Pension Fund: Pension funds or Endowment funds (NOSHPPF) (4) Investment Co.: Investment banks or institutions seeking a long term return. Note that holdings by Hedge Funds are not included (NOSHIC) (5) Employees: Employees, or by those with a substantial position in a company that provides significant voting power at an annual general meeting, (typically family members) (NOSHEM) (6) Other holdings: Entities outside one of the above categories (NOSHOF) (7) Foreign block holders: Holdings by an institution domiciled in a country other than that of the issuer (NOSHFR)	
Price	This is the adjusted default official daily closing price. It is denominated in primary units of local currency. Prices are generally based on 'last trade' or an official price fixing. The 'current' prices taken at the close of market are stored each day. These stored prices are adjusted for subsequent capital actions, and this adjusted figure then becomes the default price available	P
Book to Market Value	This is defined as the inverse of the market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity in the company (Worldscope item 03501) which is available through Datastream	BTMV
Traded Volume	This shows the number of shares traded for a stock on a particular day. The data type is reported in thousands. Both daily and non-daily figures are adjusted for capital events. However, if a capital event occurs in the latest period of a non-daily request, then the volume for that particular period only is retrieved as unadjusted.	VO
Number of Shares	This is the total number of ordinary shares that represent the capital of the company. The data type is expressed in thousands.	NOSH
Worldwide governance indicators		
Voice and Accountability	This 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 Absence of Violence/ Terrorism	This measures 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	This 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	This 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	This 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.	-- --
Control of Corruption	This 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	-- --

Appendix C. Table 1C. Empirical models

This table outlines the time invariant (Panel A) and the time varying parameter models (Panel B). The time invariant parameter models are estimated by OLS. The conditional betas of the Kalman-filter time-varying parameter models are estimated using the observation equation, where R_{it} and R_{Mt} are the excess returns of the individual and market portfolios at time t and ε_t is the disturbance term. The exact form of the related transition equation depends on the nature of the stochastic process the betas are assumed to follow and in this case a simple random walk process is imposed, following Brooks et al (1998). The observation equation and the transition equation constitute the Kalman filter state space model. However, a set of prior conditional values are necessary for the Kalman filter to forecast the future value. This technique uses the first two observations to establish the prior conditions and then estimates the entire series recursively providing conditional estimates of the parameters. The random walk specification imposes a filter on the data where parameters evolve smoothly and are contingent on the observations surrounding time t . The exact amount of data around time t needed to estimate the coefficients, that is, the dependent variable in state equations, is contingent on their variance and is estimated from the data. This approach is appropriate for the measurement of time evolving risk premiums for market and investor protection factors (Grout and Zalewska, 2006). Thus, one-step ahead predicted states and their associated standard errors are estimated for all FMPs.

Panel A: Time invariant parameter models	Panel B: Time varying parameter models
Model 1a: CAPM The standard CAPM can be estimated by OLS regression: $r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \varepsilon_{it}$	Model 1b: CAPM The conditional betas are estimated using the following observation equation: $R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ with a set of prior conditional values: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$
Model 2a: FF3F Following Fama and French (1993), additional SMB and HML terms are the size and book-to-market factors and estimated by OLS regression: $r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \varepsilon_{it}$	Model 2b: FF3F The conditional betas are estimated using the following observation equation: $R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + s_i^{Kalman} SMB + h_i^{Kalman} HML + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ $s_{it}^{Kalman} = s_{it-1}^{Kalman} + \eta_{st}, \quad \eta_{st} \sim N(0, Q)$ $h_{it}^{Kalman} = h_{it-1}^{Kalman} + \eta_{ht}, \quad \eta_{ht} \sim N(0, Q)$ with prior conditional values denoted by: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$ $s_0^{Kalman} \sim N(s_0^{Kalman}, P_0)$

	$h_0^{Kalman} \sim N(h_0^{Kalman}, P_0)$
Model 3a: Carhart 4F Following Carhart (1997), we augment FF3F with the momentum term, which is estimated by OLS regression: $r_{pt} - r_{ft} = \alpha_i + \beta_M(r_{mt} - r_{ft}) + \beta_{SMB}SMB_t + \beta_{HML}HML_t + \beta_{Mom}Mom_t + \varepsilon_{it}$	Model 3b: Carhart 4F The conditional betas are estimated using the following observation equation: $R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + s_i^{Kalman} SMB + h_i^{Kalman} HML + m_i^{Kalman} Mom + \varepsilon_t,$ $\varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ $s_{it}^{Kalman} = s_{it-1}^{Kalman} + \eta_{st}, \quad \eta_{st} \sim N(0, Q)$ $h_{it}^{Kalman} = h_{it-1}^{Kalman} + \eta_{ht}, \quad \eta_{ht} \sim N(0, Q)$ $m_{it}^{Kalman} = m_{it-1}^{Kalman} + \eta_{mt}, \quad \eta_{mt} \sim N(0, Q)$ with prior conditional values denoted by: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$ $s_0^{Kalman} \sim N(s_0^{Kalman}, P_0)$ $h_0^{Kalman} \sim N(h_0^{Kalman}, P_0)$ $m_0^{Kalman} \sim N(m_0^{Kalman}, P_0)$
Model 4a: Liquidity 2F Liu (2006) introduces a two-factor liquidity model, which is estimated by OLS regression: $r_{it} - r_{ft} = \alpha_i + \beta_i(r_{mt} - r_{ft}) + \beta_{ILLIQ}ILLIQ_t + \varepsilon_{it}$ We use two versions of the investor protection factor, created from the two rebalancing methods, monthly and annual, both with annual holding periods.	Model 4b: Liquidity 2F The conditional betas are estimated using following the observation equation: $R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + z_i^{Kalman} ILLIQ + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ $z_{it}^{Kalman} = z_{it-1}^{Kalman} + \eta_{zt}, \quad \eta_{zt} \sim N(0, Q)$ with prior conditional values denoted by: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$ $z_0^{Kalman} \sim N(z_0^{Kalman}, P_0)$
Model 5a: Investor Protection 2F A two-factor CAPM augmented with the new investor protection factor to account for institutional differences across international markets is proposed	Model 5b: Investor Protection 2F The conditional betas are estimated using the following observation equation

and can be stated $E(r_{pt}) - r_{ft} = \beta_M [E(r_{mt}) - r_{ft}] + \beta_{INV-PROTECT} E(INV - PROTECT)$ where r_{pt} is the returns on a portfolio p of stocks at time interval t, r_{mt} is the returns on the market portfolio and r_{ft} the risk free rate. INV-PROTECT is the investor protection factor. This can be rearranged and estimated by OLS regression $r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{INV-PROTECT} INV - PROTECT_t + \varepsilon_{it}$ where α_i is the constant, β_M is the market coefficient and ε_{it} is an iid disturbance term. We use two versions of the investor protection factor, created from the two rebalancing methods, monthly and annual, both with annual holding periods.	$R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + \beta_{INV-PROTECTit}^{Kalman} (INV - PROTECT) + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ $\beta_{INV-PROTECTit}^{Kalman} = \beta_{INV-PROTECTit-1}^{Kalman} + \eta_{st}, \quad \eta_{st} \sim N(0, Q)$ with prior conditional values denoted by: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$ $\beta_{INV-PROTECT0}^{Kalman} \sim N(\beta_{INV-PROTECT0}^{Kalman}, P_0)$
Model 6a: Governance 2F A two-factor CAPM augmented with the new governance factor to account for institutional differences across international markets is proposed and can be stated $E(r_{pt}) - r_{ft} = \beta_M [E(r_{mt}) - r_{ft}] + \beta_{GOVERNANCE} E(GOVERNANCE)$ where r_{pt} is the returns on a portfolio p of stocks at time interval t, r_{mt} is the returns on the market portfolio and r_{ft} the risk free rate. GOVERNANCE is the governance factor. This can be rearranged and estimated by OLS regression $r_{pt} - r_{ft} = \alpha_i + \beta_M (r_{mt} - r_{ft}) + \beta_{GOVERNANCE} GOVERNANCE_t + \varepsilon_{it}$ here α_i is the constant, β_M is the market coefficient and ε_{it} is an iid disturbance term. We use two versions of the governance factor, created from the two rebalancing methods, monthly and annual, both with annual holding periods.	Model 6b: Governance 2F The conditional betas are estimated using the following observation equation $R_{it} = \alpha_t + \beta_{it}^{Kalman} R_{Mt} + \beta_{GOVERNANCEit}^{Kalman} (GOVERNANCE) + \varepsilon_t, \quad \varepsilon_t \sim N(0, \Omega)$ The corresponding transition equation is defined: $\alpha_{it}^{Kalman} = \alpha_{it-1}^{Kalman} + \eta_{\alpha t}, \quad \eta_{\alpha t} \sim N(0, Q)$ $\beta_{it}^{Kalman} = \beta_{it-1}^{Kalman} + \eta_{\beta t}, \quad \eta_{\beta t} \sim N(0, Q)$ $\beta_{GOVERNANCEit}^{Kalman} = \beta_{GOVERNANCEit-1}^{Kalman} + \eta_{st}, \quad \eta_{st} \sim N(0, Q)$ with prior conditional values denoted by: $\alpha_0^{Kalman} \sim N(\alpha_0^{Kalman}, P_0)$ $\beta_0^{Kalman} \sim N(\beta_0^{Kalman}, P_0)$ $\beta_{GOVERNANCE0}^{Kalman} \sim N(\beta_{GOVERNANCE0}^{Kalman}, P_0)$

Internet Appendix

Appendix D. Robustness tests using the Legal Structure and Security of Property Rights index of Gwartney and Lawson (2007)

Table 1D. Factor mimicking portfolio summary statistics – for aggregate OECD market universe

This table reports the descriptive statistics, autocorrelations (at 1, 6 and 12 lags) for returns-based valuation factors including the Market, the Fama and French (1993) size (SMB) and book to market value (HML), the Jegadeesh and Titman (1993) momentum factor and the Liu (2006) liquidity factor used to explain cross section of stock returns across the market universe. The market universe in this case is the aggregate world and is equal-weighted. All factors are obtained from equal-weighted portfolios while the FF size (SMB) and book-to-market value (HML) factors are value-weighted. Summary statistics are also reported, with t-difference in means, for the highest and lowest liquidity sorted portfolios (used to create the liquidity-based valuation factor). These are based on stock returns, book-to-market value, size (market capitalization US\$), stock price, traded volume, monthly bid-ask spread and monthly percentage daily volatility in daily stock returns. Liquidity portfolios D1 and D10 are formed from annual rebalancing. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively

	Market	SMB	HML	Liquidity (1 year)	Momentum	Investor Protection (1 year)	Governance (1 year)
	Equal weight	Value weight	Value weight	Equal weight	Equal weight	Equal weight	Equal weight
Panel 1: Descriptive statistics Aggregate OECD							
Mean (%)	1.12%	1.88%	0.05%	-1.14%	0.12%	0.08%	-0.11%
t-statistic	3.23**	7.59**	0.21	-4.57**	0.33	1.41†	-1.49†
Standard Deviation (%)	4.92%	3.52%	3.20%	3.52%	5.04%	2.87%	3.32%
Skewness	-0.67	-0.31	-0.05	-2.63	-2.05	1.95	-0.16
Kurtosis	6.20	4.71	4.64	23.90	12.29	16.74	3.43
Jarque-Bera statistic	100.41	27.75	22.48	3,891.52	863.86	1,707.77	2.38
Panel 2: Pearson correlations Aggregate OECD							
Market	1.000						
SMB	-0.408	1.000					
HML (Book to Market value)	0.216	-0.167	1.000				
Liquidity (1 Year Rebalance)	0.382	-0.337	0.003	1.000			
Momentum	-0.412	0.437	-0.147	-0.223	1.000		
Investor Protection (1 Year Rebalance)	0.191	-0.131	-0.024	0.154	-0.134	1.000	
Governance (1 Year Rebalance)	0.071	0.028	0.102	-0.004	0.123	0.294	1.000
Panel 3: Autocorrelations Aggregate OECD							
1-Lag	0.217	0.230	0.174	-0.093	0.179	0.161	0.030
6-Lags	-0.118	-0.016	0.117	-0.065	0.003	0.029	0.012
12-Lags	0.015	0.128	0.108	0.094	0.068	0.092	0.071

Table 2D. Factor mimicking portfolio summary statistics – for aggregate OECD market and US only universes

This table reports the stock counts by country and ownership descriptive statistics for all ten decile sorted governance portfolios (D1 – D10). The first is a breakdown of stock counts per portfolio with respect to legal origin of their listing market and is by German, French and Scandinavian civil code versus English common law classification, following La Porta et al (2008). Developed and emerging markets are distinguished using the MSCI classification system. The second reports the descriptive statistics for all ten decile sorted investor protection portfolios (D1 – D10), with panel 1 for the World overall and panel 2 for the US-only universes. These show summary statistics for several stock-characteristic variables per decile-sorted portfolio. These are returns (equally and value weighted decile portfolios), momentum, the Liu-liquidity metric, market capitalization (US\$ billions), traded volume (US\$ millions), the monthly proportion of daily zero returns (%), mean daily stock closing price (US\$), Book-to-market value, free float proportion (%) and the investor protection metric. In the first column a t-difference in means statistical significance confidence level is provided for mean values in decile portfolio D1 in relation to the differences between these and D10. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
Panel 1: Stock count (#) – Aggregate OECD universe										
English common law	8.97	18.35	51.83	94.27	144.14	164.45	181.81	192.20	196.49	199.30
Scandinavian civil code law	2.82	19.49	29.32	24.40	12.57	7.61	4.93	1.78	1.24	0.60
French civil code law	30.05	43.24	48.66	41.36	30.85	22.40	12.38	6.22	3.50	0.94
German civil code law	51.43	32.33	31.93	18.99	8.28	5.04	2.18	1.19	0.18	0.04
North America	1.18	3.76	22.04	56.70	99.06	101.04	125.79	143.61	150.73	175.57
Europe Developed	27.05	42.57	77.06	69.91	60.96	65.78	46.83	38.68	35.29	18.69
Australasia	0.18	3.32	11.81	19.19	19.23	22.59	22.21	16.48	14.15	5.99
Scandinavia	2.82	19.49	29.32	24.40	12.57	7.61	4.93	1.78	1.24	0.60
Asia	157.93	100.84	44.27	24.18	5.70	1.61	0.21	0.12	0.00	0.00
Latin America	9.81	13.37	3.85	0.41	0.42	0.20	0.18	0.06	0.00	0.00
Europe Emerging	4.40	5.40	5.46	2.39	1.30	0.67	0.72	0.72	0.00	0.04
Middle East & Africa	6.85	8.26	3.78	1.34	0.97	0.60	0.30	0.02	0.00	0.00
Total	211.29	201.38	201.54	201.21	201.13	200.88	201.36	201.52	201.41	200.88
Panel 2: Stock count (#) – US-only universe										
S&P 500	22.59	20.08	29.63	36.31	38.81	43.68	49.06	48.19	55.12	56.07
S&P 400	26.30	31.15	24.07	28.90	22.85	21.93	21.04	20.48	17.13	15.10
S&P 600	35.32	24.91	22.46	11.00	14.49	10.66	6.29	7.67	4.22	4.27
Total	84.21	76.14	76.16	76.21	76.14	76.26	76.40	76.35	76.48	75.45

Panel 3: Summary statistics – Aggregate OECD universe	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Returns – equal weight, %	1.2757†	1.2641	1.1638	1.2373	1.2282	1.2370	1.2400	1.0401	0.9734	1.1608
Returns – value weight, %	0.4844	0.7165	0.1965	-0.1066	0.0686	0.4329	-0.4565	-0.8030	0.6061	0.2488
Momentum	0.0716	0.0710	0.0654	0.0688	0.0663	0.0669	0.0658	0.0544	0.0496	0.0647
Liu Liquidity (1 year)	10.16**	12.50	11.61	12.39	13.61	12.91	14.74	14.13	16.04	15.42
Traded volume (shares millions)	84.43**	71.94	62.51	77.96	56.09	37.45	39.52	44.23	65.49	41.37
Market Cap. (US\$ billions)	15.68**	12.80	12.13	13.90	36.42	64.96	11.65	38.68	54.33	44.90
Daily zero returns per month (%)	28.16**	20.54	18.71	15.99	13.63	12.84	11.53	10.79	11.14	10.19
Price (mean month, US\$)	43.92**	39.07	57.65	49.69	167.16	285.44	85.64	119.74	263.99	234.09
Book to Market value ratio	1.42**	24.70	1.02	0.21	0.79	0.89	0.83	0.85	0.75	0.77
Free Float (%)	71.72*	71.63	72.04	69.06	68.33	67.10	67.10	67.96	68.47	68.86
Investor Protection metric	5,631.86**	5,587.59	5,6392.02	5,392.46	5,318.11	5,181.19	5,130.10	5,181.98	5,172.24	5,122.21
Firm governance index	23.20**	21.64	20.90	20.52	19.03	18.66	16.88	16.39	14.19	10.99
Governance metric	1,816.75**	1,692.16	1,609.78	1,595.54	1,466.67	1,447.97	1,301.16	1,257.55	1,073.24	807.21
Panel 4: Summary statistics – US only universe	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)
	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Returns – equal weight (%)	1.2358†	1.3401	1.2036	1.3398	1.0618	0.9857	1.0521	1.0258	0.9850	1.0665
Returns – value weight (%)	0.1032	0.9682	0.4755	0.7787	0.4494	0.3199	0.4136	0.0721	0.5747	0.0824
Momentum	0.0727	0.0758	0.0729	0.0752	0.0615	0.0547	0.0545	0.0565	0.0535	0.0607
Liu Liquidity (1 year)	11.05**	10.29	10.01	10.12	10.29	9.59	9.50	9.46	9.25	9.28
Traded volume (shares millions)	22.56**	26.49	39.49	50.44	43.77	41.39	62.26	68.23	82.23	126.50
Market Cap. (US\$ billions)	3.13**	3.70	3.93	5.59	5.62	7.00	8.84	36.68	39.42	50.17
Daily zero returns per month (%)	14.99**	15.73	20.27	21.84	23.50	25.72	29.67	28.38	33.56	35.16
Price (mean month, US\$)	35.48**	39.56	40.83	44.45	41.57	45.24	44.90	51.77	49.60	51.66
Book to Market value ratio	0.8991**	1.0643	1.3093	1.5774	1.0580	1.6600	0.9381	-0.2490	1.7222	1.2830
Free Float (%)	66.23**	69.08	69.11	70.44	70.53	70.26	72.02	72.54	74.44	75.25
Investor Protection metric	5,102.51**	5,361.20	5,385.45	5,488.10	5,490.18	5,450.43	5,639.47	5,650.12	5,856.38	5,921.14
Firm governance index	21.13**	23.21	24.23	25.00	25.76	26.28	27.10	27.77	28.62	30.10
Governance metric	1,667.95**	1,844.25	1,930.28	1,999.62	2,066.95	2,114.18	2,183.97	2,244.31	2,319.11	2,447.92

Table 3D. Empirical results for 10 governance (1 year rank and holding period) decile portfolios – for all universes

This table reports the beta coefficients for valuation factors with t-statistics, explanatory power (R^2) and standard errors for the Fama and French (1993) three factor model (size and book to market value), the Carhart (1997) four factor model (size, book to market value and momentum) and the Liu (2006) two factor liquidity model of Liu (2006) in modelling returns of 10 liquidity sorted quintile portfolios (single-pass stock sorting following Liu, 2006). 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). D1 is the lowest illiquidity and D10 the highest. These portfolios are formed from annual rebalancing using the liquidity metric. 10 year US Treasury yield is used as the risk free rate. HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000). Numbers in square brackets are t-statistics. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low) Equal	D2 Equal	D3 Equal	D4 Equal	D5 Equal	D6 Equal	D7 Equal	D8 Equal	D9 Equal	D10 (High) Equal	D1 - D10 Equal	D1 - D10 Value
Weighting:												
Panel 1: Aggregate OECD universe												
panel 1: Governance 2F(1y)												
Alpha (%)	-0.001 [-0.66]	-0.003 [-3.72]	-0.004 [-3.53]	-0.002 [-1.07]	-0.002 [-1.93]	-0.002 [-1.94]	-0.002 [-2.13]	-0.003 [-2.89]	-0.001 [-0.88]	-0.001 [-0.66]	---	---
Beta: Market (excess return)	0.905 [41.17]	0.956 [32.52]	1.038 [42.57]	0.998 [19.38]	1.015 [52.22]	0.999 [39.68]	0.972 [61.92]	1.056 [32.06]	0.931 [35.82]	0.905 [41.17]	---	---
Beta: Governance	0.656 [24.17]	0.316 [7.72]	0.145 [4.46]	0.026 [0.58]	-0.084 [-1.95]	-0.081 [-2.48]	-0.186 [-7.84]	-0.235 [-6.99]	-0.229 [-7.76]	-0.344 [-12.70]	---	---
Adjusted R ²	0.9528	0.9405	0.9260	0.9128	0.9312	0.9351	0.9482	0.9258	0.9355	0.9407	---	---
Panel 1: Investor Protection 2F(1y)												
Alpha (%)	-0.002 [-0.90]	-0.004 [-3.29]	-0.004 [-3.55]	-0.002 [-1.12]	-0.002 [-1.84]	-0.002 [-1.79]	-0.001 [-1.54]	-0.003 [-2.54]	-0.001 [-0.52]	-0.001 [-0.07]	-0.002 [-1.67] †	-0.005 [-1.33] †
Beta: Market (excess return)	0.922 [19.42]	0.966 [24.72]	1.039 [41.03]	0.995 [19.77]	1.010 [46.24]	0.999 [40.37]	0.980 [51.31]	1.060 [36.63]	0.943 [36.87]	0.911 [36.04]	0.011 [0.19]	0.237 [1.94]
Beta: Investor Protect	0.137 [1.78]	0.044 [0.81]	0.053 [0.91]	0.037 [0.88]	0.005 [0.10]	-0.038 [-0.91]	-0.146 [-3.95]	-0.132 [-2.08]	-0.206 [-4.32]	-0.200 [-3.58]	0.337 [3.08]	0.311 [2.01]
Adjusted R ²	0.7834	0.8976	0.9186	0.9129	0.9282	0.9327	0.9394	0.9096	0.9248	0.8948	0.0775	0.0813
Panel 1: Liquidity 2F(1y)												
Alpha (%)	-0.001 [-0.33]	-0.004 [-2.76]	-0.003 [-2.19]	0.001 [0.02]	-0.001 [-0.20]	-0.001 [-0.32]	-0.001 [-0.85]	-0.001 [-1.06]	0.001 [0.63]	0.002 [1.31]	-0.002 [-1.88]*	-0.007 [-1.43] †
Beta: Market (excess return)	0.917 [20.47]	0.970 [24.12]	1.017 [44.02]	0.969 [19.14]	0.981 [49.20]	0.969 [44.12]	0.956 [47.28]	1.014 [36.82]	0.896 [30.68]	0.859 [32.32]	0.058 [1.05]	0.299 [2.32]
Beta: Liquidity	0.073 [1.37]	0.003 [0.07]	0.099 [2.43]	0.113 [2.58]	0.108 [3.52]	0.095 [3.08]	0.026 [0.72]	0.112 [3.35]	0.088 [2.54]	0.108 [3.06]	-0.035 [-0.46]	-0.102 [-0.74]
Adjusted R ²	0.7800	0.8970	0.9215	0.9176	0.9329	0.936	0.9327	0.9094	0.9134	0.8859	0.0038	0.0578
Panel 1: Carhart 4F												

Alpha (%)	-0.001	-0.004	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	0.001	0.002	-0.003	-0.005
	[-0.55]	[-2.93]	[-1.78]	[-0.32]	[-0.06]	[-0.98]	[-0.83]	[-1.48]	[0.74]	[1.29]	[-1.30] †	[-1.32] †
Beta: Market (excess return)	0.959	0.968	1.012	0.990	1.012	1.002	0.971	1.032	0.923	0.869	0.090	0.357
	[17.34]	[20.55]	[37.36]	[18.27]	[39.78]	[42.75]	[53.65]	[39.87]	[41.64]	[32.92]	[1.29]	[2.86]
Beta: SMB	-0.051	0.015	-0.071	-0.054	-0.090	-0.032	-0.029	-0.047	-0.080	-0.069	0.018	-0.089
	[-0.92]	[0.46]	[-2.27]	[-2.12]	[-3.02]	[-1.21]	[-0.96]	[-1.21]	[-2.36]	[-2.18]	[0.26]	[-0.78]
Beta: HML	-0.006	0.050	0.038	0.010	-0.097	-0.044	-0.017	-0.133	-0.038	-0.114	0.108	-0.116
	[-0.13]	[1.34]	[0.93]	[0.31]	[-3.19]	[-1.29]	[-0.44]	[-3.94]	[-0.99]	[-2.80]	[1.48]	[-0.86]
Beta: Momentum	0.084	-0.001	-0.016	0.019	0.034	0.021	0.032	-0.043	0.049	-0.037	0.122	0.227
	[1.94]	[-0.03]	[-0.74]	[0.51]	[1.24]	[0.78]	[1.16]	[-1.25]	[1.66]	[-1.09]	[1.93]	[2.06]
Adjusted R ²	0.7807	0.8970	0.9201	0.9127	0.9336	0.9328	0.9327	0.9120	0.913	0.8887	0.0239	0.0856
Panel 1: FF3F												
Alpha (%)	-0.001	-0.004	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	0.001	0.002	-0.003	-0.006
	[-0.73]	[-2.88]	[-1.77]	[-0.37]	[-0.19]	[-1.06]	[-1.01]	[-1.30]	[0.61]	[1.37]	[-1.36] †	[-1.66] †
Beta: Market (excess return)	0.935	0.968	1.016	0.985	1.003	0.994	0.962	1.044	0.909	0.879	0.056	0.293
	[20.22]	[23.71]	[40.51]	[18.95]	[42.21]	[38.43]	[49.71]	[35.92]	[37.26]	[35.69]	[1.00]	[2.32]
Beta: SMB	-0.012	0.015	-0.078	-0.045	-0.075	-0.023	-0.014	-0.067	-0.058	-0.086	0.074	0.014
	[-0.25]	[0.50]	[-2.70]	[-1.61]	[-2.68]	[-0.81]	[-0.48]	[-1.93]	[-1.84]	[-2.91]	[1.21]	[0.13]
Beta: HML	-0.011	0.050	0.039	0.009	-0.098	-0.045	-0.019	-0.131	-0.041	-0.112	0.101	-0.128
	[-0.21]	[1.32]	[0.94]	[0.28]	[-3.23]	[-1.32]	[-0.47]	[-3.92]	[-1.03]	[-2.76]	[1.35]	[-0.96]
Adjusted R ²	0.7768	0.8975	0.9204	0.9129	0.9332	0.9328	0.9322	0.9112	0.9114	0.8880	0.0031	0.0550
Panel 1: CAPM												
Alpha (%)	-0.002	-0.004	-0.004	-0.002	-0.002	-0.002	-0.001	-0.003	-0.001	0.001	-0.002	-0.005
	[-0.91]	[-3.30]	[-3.58]	[-1.13]	[-1.82]	[-1.77]	[-1.46]	[-2.45]	[-0.41]	[0.01]	[-1.70]*	[-1.33] †
Beta: Market (excess return)	0.937	0.971	1.045	0.999	1.011	0.995	0.964	1.045	0.920	0.889	0.048	0.271
	[20.74]	[25.80]	[42.02]	[20.05]	[49.98]	[41.47]	[53.88]	[34.06]	[36.42]	[34.80]	[0.90]	[2.11]
Adjusted R ²	0.7790	0.8975	0.9183	0.9129	0.9286	0.9326	0.9327	0.9053	0.9102	0.8807	0.0001	0.0586
Panel 2: OECD (excluding US) markets universe												
panel 2: Governance 2F(1y)												
Alpha (%)	-0.001	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	-0.003	-0.002	-0.001	-- --	-- --
	[-1.46]	[-4.06]	[-3.40]	[-3.15]	[-1.97]	[-1.57]	[-0.88]	[-2.26]	[-2.32]	[-1.46]		
Beta: Market (excess return)	0.960	0.992	0.971	1.019	0.995	1.051	1.024	1.005	1.023	0.960	-- --	-- --
	[52.70]	[26.63]	[26.70]	[32.25]	[23.90]	[22.13]	[30.71]	[33.82]	[45.04]	[52.70]		
Beta: Governance	0.666	0.409	0.178	0.034	-0.042	0.019	-0.073	-0.115	-0.210	-0.334	-- --	-- --
	[23.60]	[7.74]	[3.83]	[0.97]	[-1.10]	[0.32]	[-1.35]	[-2.59]	[-7.23]	[-11.82]		
Adjusted R ²	0.9400	0.876	0.8911	0.8964	0.9205	0.9097	0.8973	0.9128	0.9445	0.9426	-- --	-- --

Panel 2: Investor Protection 2F (1y)

Alpha (%)	-0.001	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	-0.003	-0.002	-0.002	0.001	0.001
	[-0.19]	[-2.45]	[-2.99]	[-3.09]	[-1.98]	[-1.49]	[-0.92]	[-2.37]	[-2.50]	[-1.50]	[1.52] †	[1.34] †
Beta: Market (excess return)	0.904	0.957	0.955	1.015	0.997	1.048	1.030	1.012	1.039	0.985	-0.081	-0.035
	[21.63]	[20.16]	[22.90]	[32.63]	[24.04]	[21.75]	[30.73]	[36.00]	[46.32]	[49.48]	[-1.64]	[-0.54]
Beta: Investor Protect	0.119	0.083	-0.014	-0.058	-0.087	-0.070	-0.041	-0.147	-0.105	-0.206	0.325	0.295
	[1.59]	[0.99]	[-0.21]	[-0.84]	[-1.68]	[-1.22]	[-0.68]	[-2.16]	[-1.65]	[-3.99]	[3.49]	[2.67]
Adjusted R ²	0.7861	0.8222	0.8799	0.8966	0.9212	0.9103	0.8959	0.9123	0.9324	0.9126	0.0671	0.0215

Panel 2: Liquidity 2F (1y)

Alpha (%)	0.002	-0.002	-0.003	-0.002	-0.001	-0.001	0.001	-0.002	-0.001	-0.001	0.002	0.002
	[0.84]	[-1.12]	[-1.82]	[-1.79]	[-0.47]	[-0.36]	[0.42]	[-1.67]	[-1.42]	[-0.28]	[1.80]*	[1.68]*
Beta: Market (excess return)	0.872	0.922	0.930	0.987	0.963	1.017	1.001	0.999	1.022	0.966	-0.093	-0.054
	[21.98]	[21.52]	[21.67]	[35.94]	[25.18]	[22.07]	[33.12]	[34.86]	[48.65]	[46.46]	[-1.85]	[-0.87]
Beta: Liquidity	0.116	0.134	0.098	0.114	0.141	0.127	0.118	0.063	0.076	0.095	0.020	0.049
	[4.27]	[4.33]	[4.66]	[3.84]	[3.19]	[3.74]	[4.71]	[2.70]	[3.96]	[4.28]	[0.65]	[1.08]
Adjusted R ²	0.7928	0.8328	0.8866	0.9042	0.9332	0.9193	0.9042	0.9111	0.9342	0.9111	0.0119	0.0043

Panel 2: Carhart 4F

Alpha (%)	-0.001	-0.002	-0.004	-0.003	-0.001	-0.001	0.001	-0.003	-0.001	0.001	0.001	-0.001
	[-0.11]	[-1.61]	[-2.52]	[-1.78]	[-0.82]	[-0.74]	[0.47]	[-1.94]	[-1.01]	[0.09]	[-1.14]	[-1.39] †
Beta: Market (excess return)	0.928	0.964	0.951	0.976	0.981	1.036	1.016	1.018	1.013	0.974	-0.046	0.017
	[20.40]	[20.47]	[19.89]	[30.72]	[21.70]	[19.68]	[28.10]	[35.03]	[60.24]	[48.31]	[-0.86]	[0.28]
Beta: SMB	-0.033	-0.051	0.009	-0.036	-0.072	-0.047	-0.073	-0.010	-0.051	-0.088	0.055	0.127
	[-0.76]	[-1.27]	[0.23]	[-1.13]	[-3.16]	[-2.04]	[-2.27]	[-0.26]	[-1.66]	[-3.03]	[1.06]	[1.54]
Beta: HML	-0.042	-0.129	-0.034	0.038	-0.016	-0.040	-0.099	-0.007	-0.025	-0.043	0.001	-0.182
	[-1.06]	[-2.91]	[-0.76]	[1.31]	[-0.46]	[-1.22]	[-2.39]	[-0.15]	[-0.66]	[-0.87]	[0.02]	[-2.28]
Beta: Momentum	0.083	0.021	-0.029	-0.062	0.007	-0.009	-0.012	0.012	-0.040	0.018	0.065	-0.012
	[1.96]	[0.53]	[-0.82]	[-1.58]	[0.22]	[-0.26]	[-0.37]	[0.38]	[-1.14]	[0.40]	[1.04]	[-0.17]
Adjusted R ²	0.7867	0.8278	0.8797	0.8999	0.9218	0.9106	0.9018	0.9078	0.9334	0.9087	0.0195	0.0230

Sub panel 2E: FF3F

Alpha (%)	-0.001	-0.002	-0.004	-0.003	-0.001	-0.001	0.001	-0.003	-0.001	0.001	-0.001	-0.001
	[-0.11]	[-1.62]	[-2.52]	[-1.76]	[-0.82]	[-0.74]	[0.47]	[-1.94]	[-0.98]	[0.09]	[-1.14]	[-1.39] †
Beta: Market (excess return)	0.909	0.959	0.958	0.991	0.979	1.038	1.018	1.015	1.022	0.970	-0.061	0.019
	[22.13]	[21.80]	[21.71]	[32.29]	[22.43]	[19.92]	[28.5]	[34.35]	[50.4]	[46.45]	[-1.22]	[0.33]
Beta: SMB	0.002	-0.042	-0.004	-0.063	-0.069	-0.051	-0.078	-0.005	-0.068	-0.080	0.082	0.122
	[0.06]	[-1.04]	[-0.10]	[-2.25]	[-2.78]	[-2.28]	[-2.59]	[-0.13]	[-2.52]	[-2.51]	[1.93]	[1.49]
Beta: HML	-0.049	-0.13	-0.032	0.043	-0.017	-0.039	-0.098	-0.008	-0.022	-0.044	-0.004	-0.181
	[-1.20]	[-2.90]	[-0.72]	[1.50]	[-0.49]	[-1.19]	[-2.39]	[-0.17]	[-0.59]	[-0.91]	[-0.07]	[-2.33]

Adjusted R ²	0.7834	0.8284	0.8798	0.8982	0.9222	0.911	0.9022	0.9082	0.9328	0.9089	0.0169	0.0278
Panel 2: CAPM												
Alpha (%)	-0.001	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	-0.003	-0.003	-0.002	0.002	0.001
	[-0.12]	[-2.42]	[-2.98]	[-3.06]	[-2.07]	[-1.54]	[-0.98]	[-2.52]	[-2.66]	[-1.68]	[1.66] †	[1.44] †
Beta: Market (excess return)	0.902	0.956	0.955	1.016	0.999	1.049	1.031	1.016	1.041	0.990	-0.088	-0.042
	[21.37]	[20.15]	[22.89]	[33.16]	[24.19]	[21.85]	[30.83]	[36.31]	[45.63]	[47.00]	[-1.72]	[-0.64]
Adjusted R ²	0.7845	0.8219	0.8805	0.8965	0.9203	0.9100	0.8962	0.9090	0.9309	0.9054	0.0160	0.0021

Table 4D. Empirical results for 10 governance (1 year rank and holding period) decile portfolios – for all three universes

This table reports the beta coefficients for valuation factors with t-statistics, explanatory power (R^2) and standard errors for the two factor liquidity augmented CAPM models of Investor Protection 2F, Governance 2F, Governance 2F using Protection deciles. 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). D1 is the lowest illiquidity and D10 the highest. Panels 1 and 2 reports estimation results based on decile portfolios formed from annual rebalancing using the new governance metric. Panel 3 reports estimations from deciles formed from similar annual rebalancing using the investor protection (ownership derivative) metric of Hearn et al (2017). HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 5.0000). Numbers in square brackets are t-statistics. †, *, ** indicates significance at the 10%, 5%, and 1% levels respectively.

	D1 (Low)	D2	D3	D4	D5	D6	D7	D8	D9	D10 (High)	D1 - D10	D1 - D10
Weighting:	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Equal	Value
Panel 1: Investor Protection 2F(1y) using Governance deciles												
Panel 1: OECD												
Alpha (%)	0.001 [1.04]	-0.001 [-0.21]	-0.001 [-0.83]	-0.001 [-1.18]	-0.001 [-1.09]	-0.001 [-0.85]	-0.001 [-0.60]	-0.001 [-0.31]	-0.001 [-0.51]	0.001 [1.29] †	-0.001 [-0.01]	-0.008 [-0.89]
Beta: Market (excess return)	1.043 [29.77]	1.081 [58.98]	1.059 [60.62]	1.047 [61.07]	1.048 [61.19]	1.000 [79.63]	0.962 [74.61]	0.935 [57.85]	0.907 [46.36]	0.943 [45.61]	0.099 [2.15]	0.218 [1.47]
Beta: Investor Protect	0.148 [3.21]**	0.098 [2.63]**	0.042 [1.82]*	-0.040 [-1.86]*	-0.095 [-3.62]**	-0.104 [-4.64]**	-0.055 [-2.16]*	-0.001 [-0.05]	0.091 [2.81]**	-0.095 [-2.82]**	0.243 [3.77]**	-0.137 [-0.63]
Adjusted R ²	0.8646	0.8393	0.9692	0.9607	0.972	0.9688	0.9672	0.9613	0.9223	0.938	0.1065	0.016
Panel 1: OECD (excl. US)												
Alpha (%)	0.001 [1.22]	0.001 [0.88]	0.001 [0.69]	-0.001 [-1.54] †	-0.001 [-0.31]	-0.001 [-0.77]	-0.001 [-0.67]	-0.001 [-0.75]	-0.003 [-3.05]**	0.001 [0.60]	0.001 [0.44]	-0.004 [-0.42]
Beta: Market (excess return)	0.952 [48.31]	1.149 [22.18]	1.051 [36.05]	1.074 [65.49]	1.023 [64.81]	1.048 [86.26]	0.963 [59.81]	0.932 [51.05]	0.900 [34.98]	0.960 [59.43]	-0.007 [-0.27]	0.133 [0.87]
Beta: Investor Protect	0.007 [0.19]	-0.018 [-0.60]	-0.030 [-1.10]	-0.019 [-0.81]	-0.041 [-1.97]*	0.004 [0.21]	0.026 [1.15]	0.089 [3.51]**	0.176 [4.55]**	-0.168 [-4.95]**	0.175 [3.02]**	0.140 [0.52]
Adjusted R ²	0.9122	0.8532	0.7592	0.9698	0.9744	0.9748	0.9589	0.9337	0.9127	0.9407	0.0497	0.0067
Panel 2: Governance 2F(1y) using Governance deciles												
Panel 2: OECD												
Alpha (%)	-0.001 [-0.66]	-0.003 [-3.72]**	-0.004 [-3.53]**	-0.002 [-1.07]	-0.002 [-1.93]*	-0.002 [-1.94]*	-0.002 [-2.13]*	-0.003 [-2.89]**	-0.001 [-0.88]	-0.001 [-0.66]	-- --	-- --
Beta: Market (excess return)	0.905 [41.17]	0.956 [32.52]	1.038 [42.57]	0.998 [19.38]	1.015 [52.22]	0.999 [39.68]	0.972 [61.92]	1.056 [32.06]	0.931 [35.82]	0.905 [41.17]	-- --	-- --
Beta: Governance	0.656 [24.17]**	0.316 [7.72]**	0.145 [4.46]**	0.026 [0.58]	-0.084 [-1.95]*	-0.081 [-2.48]*	-0.186 [-7.84]**	-0.235 [-6.99]**	-0.229 [-7.76]**	-0.344 [-12.70]**	-- --	-- --
Adjusted R ²	0.9528	0.9405	0.926	0.9128	0.9312	0.9351	0.9482	0.9258	0.9355	0.9407	-- --	-- --

Panel 2: OECD (excl. US)

Alpha (%)	-0.001 [-1.46] †	-0.004 [-4.06]**	-0.004 [-3.40]**	-0.004 [-3.15]**	-0.003 [-1.97]*	-0.002 [-1.57] †	-0.001 [-0.88]	-0.003 [-2.26]*	-0.002 [-2.32]*	-0.001 [-1.46] †	---	---
Beta: Market (excess return)	0.960 [52.70]	0.992 [26.63]	0.971 [26.70]	1.019 [32.25]	0.995 [23.90]	1.051 [22.13]	1.024 [30.71]	1.005 [33.82]	1.023 [45.04]	0.960 [52.70]	---	---
Beta: Governance	0.666 [23.60]**	0.409 [7.74]**	0.178 [3.83]**	0.034 [0.97]	-0.042 [-1.10]	0.019 [0.32]	-0.073 [-1.35] †	-0.115 [-2.59]**	-0.210 [-7.23]**	-0.334 [-11.82]**	---	---
Adjusted R ²	0.9400	0.876	0.8911	0.8964	0.9205	0.9097	0.8973	0.9128	0.9445	0.9426	--	--

Panel 3: Governance 2F(1y) using Investor Protection deciles**Panel 3: OECD**

Alpha (%)	-0.002 [-0.90]	-0.004 [-3.29]**	-0.004 [-3.55]**	-0.002 [-1.12]	-0.002 [-1.84]*	-0.002 [-1.79]*	-0.001 [-1.54] †	-0.003 [-2.54]*	-0.001 [-0.52]	-0.001 [-0.07]	-0.002 [-0.67]	-0.005 [-1.33] †
Beta: Market (excess return)	0.922 [19.42]	0.966 [24.72]	1.039 [41.03]	0.995 [19.77]	1.010 [46.24]	0.999 [40.37]	0.980 [51.31]	1.060 [36.63]	0.943 [36.87]	0.911 [36.04]	0.011 [0.19]	0.237 [1.94]
Beta: Governance	0.137 [1.78]*	0.044 [0.81]	0.053 [0.91]	0.037 [0.88]	0.005 [0.10]	-0.038 [-0.91]	-0.146 [-3.95]**	-0.132 [-2.08]*	-0.206 [-4.32]**	-0.200 [-3.58]**	0.337 [3.08]**	0.311 [2.01]*
Adjusted R ²	0.7834	0.8976	0.9186	0.9129	0.9282	0.9327	0.9394	0.9096	0.9248	0.8948	0.0775	0.0813

Panel 3: OECD (excl. US)

Alpha (%)	-0.001 [-0.19]	-0.004 [-2.45]*	-0.004 [-2.99]**	-0.004 [-3.09]**	-0.003 [-1.98]*	-0.002 [-1.49] †	-0.001 [-0.92]	-0.003 [-2.37]*	-0.002 [-2.50]*	-0.002 [-1.50] †	0.001 [0.52]	0.001 [0.34]
Beta: Market (excess return)	0.904 [21.63]	0.957 [20.16]	0.955 [22.90]	1.015 [32.63]	0.997 [24.04]	1.048 [21.75]	1.030 [30.73]	1.012 [36.00]	1.039 [46.32]	0.985 [49.48]	-0.081 [-1.64]	-0.035 [-0.54]
Beta: Governance	0.119 [1.59] †	0.083 [0.99]	-0.014 [-0.21]	-0.058 [-0.84]	-0.087 [-1.68]*	-0.070 [-1.22]	-0.041 [-0.68]	-0.147 [-2.16]*	-0.105 [-1.65]*	-0.206 [-3.99]**	0.325 [3.49]**	0.295 [2.67]**
Adjusted R ²	0.7861	0.8222	0.8799	0.8966	0.9212	0.9103	0.8959	0.9123	0.9324	0.9126	0.0671	0.0215

Table 5D. Time varying parameter model tests of CAPM-type and multifactor models using monthly excess returns for decile size, book-to-market value, investor protection and governance-sorted portfolios with annual rebalancing for the period January 2001 – September 2017

This table reports the average time varying alpha terms, proportions of the sample for which the lower standard error band is negative (that is, where the alpha lacks statistical significance) and proportions of testing asset portfolios (deciles portfolios) where convergence is achieved. Time-varying parameter Kalman filter CAPM-type and multifactor CAPM-based models are used where these are based on CAPM, three factor Fama and French (1993) Size and Book-to-Market augmented CAPM, Liu (2006) two factor liquidity-augmented CAPM and the two factor investor protection augmented CAPM. 1y indicates annual rebalancing used in factor formation (as opposed to monthly rebalancing). < denotes the largest negative value of each of the three information criterion (that is the model of choice)

	Time series		Information criterion			%		Time series		Information criterion			%
	Mean alpha	% SE (alpha) negative	SBC	HQC	AIC	Converge		Mean alpha	% SE (alpha) negative	SBC	HQC	AIC	Converge
Panel 1: OECD overall	Size decile portfolios							Book-to-Market decile portfolios					
CAPM	-0.00069	64.89%	-5.41	-5.43	-5.44	90.00%		-0.00064	68.38%	-5.56	-5.58	-5.59	100.00%
FF3F	-0.00346	81.75%	-5.53	-5.57	-5.60	60.00%		-0.00054	73.86%	-4.70	-4.73	-4.76	50.00%
Carhart 4F	-0.00175	80.25%	-5.34	-5.39	-5.42	60.00%		0.00039	75.77%	-4.73	-4.78	-4.80	50.00%
Liquidity 2F (1yr)	-0.00032	70.61%	-5.46	-5.49	-5.51	80.00%		-0.00009	73.54%	-5.66	-5.69	-5.71	100.00%
Investor Protect 2F (1yr)	-0.00080	64.90%	-5.29	-5.32	-5.34	30.00%		-0.00062	72.04%	-5.51	-5.54	-5.56	100.00%
Governance 2F (1yr)	-0.00261	73.41%	-5.58<	-5.61<	-5.63<	80.00%		-0.00044	70.78%	-5.72<	-5.75<	-5.77<	90.00%
	Investor Protection-1y decile portfolios							Governance-1y decile portfolios					
CAPM	-0.00027	66.39%	-5.28	-5.30	-5.32	80.00%		-0.00234	69.88%	-4.13	-4.14	-4.15	80.00%
FF3F	0.00022	71.83%	-5.26	-5.30	-5.33	40.00%		-0.00111	72.64%	-3.24	-3.27	-3.29	30.00%
Carhart 4F	-0.00099	80.95%	-5.30	-5.34	-5.38	30.00%		-0.00258	78.84%	-4.49	-4.54	-4.57	10.00%
Liquidity 2F (1yr)	-0.00005	69.21%	-5.24	-5.27	-5.29	60.00%		-0.00068	64.35%	-4.65	-4.67	-4.69	90.00%
Investor Protect 2F (1yr)	-0.00024	67.21%	-5.73<	-5.76<	-5.78<	50.00%		-0.00143	75.07%	-4.83	-4.86	-4.88	80.00%
Governance 2F (1yr)	-0.00046	69.14%	-5.24	-5.27	-5.29	70.00%		-0.00237	72.75%	-4.92<	-4.95<	-4.97<	80.00%
Panel 2: OECD exclude US	Size decile portfolios							Book-to-Market decile portfolios					
CAPM	-0.00093	66.17%	-5.00	-5.02	-5.03	90.00%		-0.00051	72.72%	-5.36	-5.38	-5.39	100.00%
FF3F	-0.00266	80.25%	-5.08	-5.12	-5.15	60.00%		-0.00171	84.92%	-5.32	-5.36	-5.38	20.00%
Carhart 4F	-0.00166	79.54%	-5.09	-5.14	-5.17	60.00%		-0.00087	83.81%	-4.67	-4.71	-4.74	50.00%
Liquidity 2F (1yr)	-0.00038	74.19%	-5.10	-5.13	-5.15	80.00%		-0.00022	73.01%	-5.49	-5.52	-5.54	100.00%
Investor Protect 2F (1yr)	-0.00300	77.48%	-5.21	-5.24	-5.26	70.00%		-0.00025	73.02%	-5.38	-5.41	-5.43	70.00%
Governance 2F (1yr)	-0.00438	74.43%	-5.22<	-5.25<	-5.27<	60.00%		-0.00050	75.60%	-5.49<	-5.53<	-5.55<	90.00%
	Investor Protection-1y decile portfolios							Governance-1y decile portfolios					
CAPM	-0.00036	67.42%	-5.15	-5.17	-5.18	90.00%		-0.00304	72.04%	-4.38	-4.40	-4.42	90.00%
FF3F	-0.00081	71.28%	-4.66	-4.70	-4.72	30.00%		-0.00188	73.37%	-4.14	-4.17	-4.20	30.00%
Carhart 4F	-0.00112	81.48%	-3.64	-3.68	-3.70	30.00%		-0.00208	81.90%	-4.21	-4.26	-4.30	50.00%
Liquidity 2F (1yr)	-0.00049	70.63%	-5.20<	-5.23<	-5.25<	80.00%		-0.00023	70.49%	-4.45	-4.48	-4.50	100.00%
Investor Protect 2F (1yr)	-0.00067	71.16%	-4.80	-4.83	-4.85	20.00%		-0.00244	76.76%	-4.31	-4.34	-4.36	80.00%
Governance 2F (1yr)	-0.00061	71.58%	-5.03	-5.06	-5.08	60.00%		-0.00306	73.57%	-4.59<	-4.61<	-4.63<	80.00%