REGULATORY HARMONIZATION AND THE DEVELOPMENT OF PRIVATE EQUITY MARKETS*

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Abstract

This paper introduces a new dataset from 100 Dutch institutional investors' domestic and international asset private equity allocations. The data indicate that the comparative dearth of regulations of private equity funds impedes institutional investor participation in private equity funds, particularly in relation to the lack of transparency. The data further indicate that regulatory harmonization of institutional investors has increased Dutch institutional investor allocations to domestic and international private equity funds, particularly via the harmonization from the International Financial Reporting Standards (regulation of reporting standards and transparency), the Financieel Toetsingkader (regulation of portfolio management standards such as of matching assets and liabilities), and Basel II (regulation of risk management and disclosure standards).

Keywords: Private Equity; Law and Finance

JEL Classification: G23, G24, G28, K22, K34

1. Introduction

Institutional investors have various motivations in their investment strategies when deciding to allocate capital to stocks, bonds, derivatives and alternative investments, such as private equity. Portfolios are structured to trade-off the risk and return from diversified combinations of assets, and are influenced by institutional and regulatory factors, and possibly behavioral biases.

The purpose of this study is to facilitate an understanding of the factors that motivate institutional investors to allocate capital to private equity.[1] We introduce extremely specific details from the institutional investor's motivations to contribute capital to private equity funds, thereby building on the prior literature. The data are derived from a survey of institutional investors in The Netherlands. The consideration of Dutch institutional investors is particularly timely (as at 2005) in that there have been significant changes in the regulation of institutional investors in The Netherlands.

Our particular interest in this paper is in assessing the role of law versus economics in driving institutional investor capital allocation decisions to private equity. First, we study the effect of a comparative dearth of regulations of private equity funds on institutional investor allocations to private equity. The dearth or lack of regulations in private equity to which we refer is related to the fact that investors in private equity funds are institutional investors and high net worth individuals (not the so-called unsophisticated retail investors) and therefore these funds do not receive the same degree of scrutiny as other types of retail based funds, such as mutual funds. This, as some would say, inadequate scrutiny pertains to the level of secrecy that private equity funds can, and do, maintain about their operations and investments, and also the "greater influence" on the part of institutional investors in allocating their clients' funds to private equity (due to a lack of regulation or restrictions on their portfolio allocation) . The lack of regulations is also related to the fact that private equity funds invest in privately held companies and not publicly held companies so they do not fall in the purview of oversight by securities authorities either. Not only do the institutional investors have an inordinate amount of influence in allocating capital to private equity, but private equity funds themselves have great influence on their own portfolio allocation decisions (at least in terms of regulatory oversight, but they may face restrictions placed upon them by contractual restrictive covenants by their institutional investors) and regularly justify their opaque or less than transparent disclosure of their activities and returns to their institutional investors as necessary in the interest of their investee companies. The only actual oversight

[1] In this paper for ease of exposition we refer to private equity as a generic term that also includes earlier stage venture capital investments. This paper analyses Dutch institutional investors, and regulations pertaining to such investors do not make material distinctions for venture capital and private equity investments.

that private equity funds face includes the fact that private equity funds, if structured as a corporate body or limited partnership, are subject to the requirements of all other like institutions, and if registered with a government ministry for tax purposes (tax deductions for subsidizing R&D and the like), also subject to the ministry's requirements. In every practical sense, therefore, the operations of private equity funds are not regulated above and beyond that of any corporate body. This is in sharp contrast to mutual funds, for example.

In the second major component of this empirical study, we consider the extent to which the changes in regulations of institutional investors by regulators seeking to "harmonize" the existing regulations affecting financial institutions are important to institutional investor's decisions to allocate capital to private equity. We examine three primary regulatory changes: the new International Financial Reporting Standards ("IFRS") in 2005, the proposed new Financieel Toetsingkader ("FTK") for 2006, and the new Basel II regulations in 2004. The IFRS pertains to accounting practices and reporting standards, providing clarity for private equity reporting practices among institutional investors and across countries. The FTK is a Dutch law that is designed to bring international / European Union standards to The Netherlands. The FTK primarily relates to asset allocation practices for pension funds such that an institution appropriately matches assets and liabilities (thereby increasing the scope for investment in private equity relative to Dutch investors' practices prior to 2005). Basel II directly relates to the credit risk management practices of banks, and indirectly relates to insurance companies and pension funds in respect of institutions generally adopting best practices and standards for risk management and capital adequacy (in line with comparable retail client based financial institutions). Harmonization of regulations faced directly by institutional investors facilitates investment in private equity through enabling different types of institutional investors (pension funds, banks and insurance companies) to act as limited partners for the same private equity fund, and by enabling different institutions in different countries to act as limited partners in private equity funds. This is expected to affect institutional investor's asset allocation decisions in private equity, the geographic region in which the institutional investor invests, and the mode of private equity investment (direct private company, direct fund, and fund-of-fund investments).

In order to empirically study the two primary issues addressed herein, we introduce a new dataset from a survey of Dutch institutional investors that was carried out in 2005. The survey data comprise information from 100 Dutch institutions, 29 of which are currently investing in private equity and 35 of which plan on investing in private equity over the period 2006-2010. The data comprise extremely specific details on the institutions' portfolio management practices, as well as their perceptions of the importance of various economic, legal and institutional factors that influence their portfolio allocation

decisions. Institutional investors' positions regarding their objectives in their strategic asset allocation were sought. More significantly, views regarding the perceived risks and hurdles faced by such investors were sought to determine main concerns in adding private equity as a type of asset. Such perceived risks and hurdles, including poor product knowledge[2], complex terms and conditions, long time horizons, limited liquidity,[3] lack of transparency, and lack of market-wide accepted performance benchmarks provided evidence of a certain gap between investors' requirements for effective asset allocation, and private equity offerings. Our data enable an empirical assessment of institutional investor allocations to private equity while controlling for a variety of factors potentially pertinent to asset allocation.

The data indicate a number of interesting findings. First, institutional investors do not invest in private equity because there is a comparative dearth of regulations of private equity funds. The comparative dearth of regulations of private equity funds is in fact a hindrance to institutional investor private equity investment. In particular, the data indicate that an increase in the ranking of the importance of a comparative dearth of regulations in private equity by 1 on a scale of 1 (lowest importance) to 5 (highest importance) reduces the probability that the institutional investor will invest in private equity by approximately 17% (in our most conservative estimates), and reduces the amount invested by up to 1% of the institutions' total assets. The lack of regulations coupled with the high risk and illiquidity in private equity gives rise to extra screening, governance and contract costs, which in turn requires specialized skill on the part of the institution to participate in the private equity asset class. Therefore, institutions that consider the comparative dearth of regulations in private equity to be more important for their investment allocation decisions are essentially ranking the potential agency problems as being more pronounced and are less likely to invest in private equity.

The second primary new finding in this paper is that the IFRS (2005), FTK (2006), and Basel II (2004) regulations all appear to facilitate investment on the part of the institution in private equity, and cross-border investments in private equity. Note that our data comprise Dutch pension funds, insurance companies and banks. The data indicate that an increase in the ranking of the importance of these regulatory harmonization measures on a scale of 1 (lowest importance) to 5 (highest importance) increases the probability that the institutional investor will invest in private equity by approximately 16%, and increases the amount invested by up to 1% of the institution's total assets. As well, we find evidence that an increase in the ranking of these regulatory changes on a scale of 1 to5 by 1 point, increases the

[2] Despite the important role of private equity in financing and fostering innovative firms, and in reallocating capital to more productive sectors of the economy, relatively little is known about the key characteristics of private equity as an asset class: liquidity, risk, and return.

[3] Private equity investment is essentially illiquid (Sahlman, 1990, Lerner and Schoar, 2005; Kaplan *et al*., 2006).

amount invested in private equity in The Netherlands by up to 0.7% of an institution's total assets, and increases the amount invested in private equity in Europe outside The Netherlands by 0.8% of an institution's total assets. We further find evidence that an increase in the ranking of the importance of these harmonization efforts on a scale of 1 to5 by 1 point, reduces the amount invested by way of direct fund investments by up to 0.8% of an institution's total assets, and increases the amount invested by way of fund-of-fund investments by up to 0.6% of an institution's total assets. The econometric evidence indicates there are some differences in the importance of these regulatory changes depending on the type of financial institution (pension fund, insurance company or bank), but these differences are not pronounced due to the fact these regulations are at least indirectly related to all of the institutions' portfolio management decisions in our dataset.

The details in the data also offer interesting insights in respect of institutional characteristics in terms of size, returns expectations, corporate objectives, portfolio diversification objectives, and the institutions' views on the importance of achieving a yearly rate of return to report to their own clients or beneficiaries. The data indicate larger institutional investors are more likely to invest in private equity (although at a diminishing rate): an increase in the assets managed by an institutional investor from €1 billion to €2 billion increases the probability that an institutional investor will invest in private equity by about 5%, while an increase in assets from €10 billion to €11 billion increases the probability that an institutional investor will invest in private equity by 1%. Among those institutions that do plan to invest in private equity in 2006 to 2010, larger institutions are more likely to invest in the United States ("U.S.") and less likely to invest domestically. Institutions that expect greater returns from private equity relative to stock markets are also more likely to invest in private equity.[4] Particular characteristics unique to the institutions in our dataset are also important for the mode of investment: institutions that have strategic corporate objectives are more likely to invest directly in a private company, while fund-of-funds investments are more likely for institutional investors that seek diversification and consistent annual returns to report to the institution's clients or beneficiaries.

Our paper is inspired by related prior work on venture capital and private equity fundraising. Gompers and Lerner (1998b) have shown that private equity fundraising is facilitated by economic (stock market conditions and real GDP growth) and legal conditions (taxation and the prudent man rule), based on data from the U.S. (see also Poterba, 1989a,b; see also theory in Keuschnigg and Nielsen, 2003a,b).

[4] Some prior papers are consistent with the view that returns to venture capital and private equity are higher than stock returns; for US evidence, see Gompers and Lerner (1998a, 1999) and Cochrane (2005); for international evidence see Manigart *et al.* (2002), Cumming and Walz (2004) and Hege *et al.* (2004). For a contrasting view that also takes into account of fees, see Phalippou and Zollo (2005). See also Kaplan and Schoar (2005) for evidence of persistence in private equity returns.

Subsequent evidence has documented international differences in private equity fundraising using aggregate industry datasets (Jeng and Wells, 2000; Leleux and Surlemount, 2003; Allen and Song, 2003; Armour and Cumming, 2005).[5] Our study differs from these prior papers in that rather than examining data from a private equity fund as in Gompers and Lerner (1998b) or international aggregate industry-wide datasets, we instead focus on data from institutional investors that contribute capital to private equity funds. We study for the first time the effect of (1) the comparative dearth of regulations on private equity funds and (2) regulatory harmonization on allocations to private equity by institutional investors. .

This paper is organized as follows. Section 2 outlines the theoretical propositions and testable hypotheses. The data are introduced in section 3, and summary statistics are provided in that section. Section 4 provides the multivariate empirical analyses of private equity allocations by Dutch institutional investors and regulations. Section 5 addresses this issue of why incumbent private equity fund may oppose disclosure despite the evidence that greater disclosure would bring more capital into the private equity industry. Limitations are discussed and suggestions for future research are outlined in section 6. Concluding remarks follow in the last section.

2. Legal and Institutional Details and Testable Hypotheses

This section describes the influence of a harmonization of regulations faced by institutional investors on investment in private equity in subsection 2.1. In subsection 2.2 we then discuss the incentives for institutional investors to commit capital to private equity in view of a dearth of regulations on private equity funds. A summary follows in subsection 2.3.

2.1. The Role of Regulatory Harmonization in Facilitating Private Equity Investment

Private equity limited partnerships typically last for 10 years with an option to continue for 3 years as the investment of the private equity fund are wound down. Private equity investments also take time (often a few years) to reach the desired level of exposure, as fund managers must themselves screen potential investees (Gompers and Lerner, 1998a,b, 1999). Investment in private equity is therefore extremely illiquid. Institutional investors, typically pension funds, insurance companies and banks, are limited partners, while the general partner is a professional private equity fund manager that earns a fixed

[5] See also Mayer *et al.* (2005), Lerner *et al.* (2005) and Nielsen (2006) for related work on the role of sources of funds from types of institutional investors in venture capitalist activities. Other studies on international differences in private equity and venture capital markets include Hege *et al.* (2005), Lerner and Schoar (2005), Black and Gilson (1998), Gilson (2003), Bascha and Walz (2001b), Bigus (2004), Gilson and Schizer (2003), Manigart *et al.* (2002), Schwienbacher (2002).

fee based on contributed assets from institutional investors (typically 1-3%) and a carried interest that is commonly around 20% (at least for riskier venture capital investments). Limited partners are legally prohibited from being involved in the day-to-day operation of a private equity fund (otherwise risk losing their limited liability status as a limited partner).

Limited partnerships and similar forms of organization involve an assignment of rights and responsibilities in the form of a very long term contract over a period of 10 or more years. The purpose of this contract is to mitigate the potential for agency problems associated with the private equity managers' investing institutional investor capital in private entrepreneurial firms. The massive potential for agency problems in the reinvestment of capital, and the very long term nature of the limited partnership contract, make extremely important the assignment of rights and obligations in the contract in the form of restrictive covenants. Restrictive covenants include constraints in the authority of the fund manager regarding investment decisions (such as the size of investment in any one portfolio company, and the ability of the fund manager to borrow money from a bank), restrictions on the fund manager's investment powers (such as co-investment and sale of fund interests by the fund managers), covenants relating to the types of investment (such as public securities, leveraged buyouts, foreign securities and different asset classes like real estate), and covenants on fund operation (such as sale of fund interests, and restrictions on fundraising for new funds).

Institutional investors (such as pension fund, insurance companies, and financial institutions) are subject to stringent regulatory oversight in view of the nature of the products they offer and their customer demographics. Customers of pension funds, insurance companies and banks are more vulnerable as they entrust a significant fraction of their income and accumulated wealth to these institutions. Regulations are therefore in place to address the funding of these institutions, to ensure that the institutions do not take advantage of the customers and provide the proper products that are not only appropriate for each type of customer, but also structured properly to meet their expectations. Laws also regulate solvency requirement to ensure that the contractual liabilities of these institutions are met, especially in view of the vulnerable nature of the customers. Assets have to be protected in some manner as institutions such as pension funds and insurance companies only meet their contractual obligations in the distant future. The allocation of assets needs to be balanced in terms of risk, return and ability to meet expected and unexpected liabilities.[6]

[6] Each product offered will have different liabilities. Under a contract made between a potential pensioner and a pension fund, the fund will be able to determine exactly when payments to the pensioner will start. This is not possible under a life insurance contract (although approximations can be made with actuarial principles).

Regulatory harmonization can facilitate institutional investor investment in private equity in at least two direct ways. First, where different types of institutional investors have the same regulatory constraints, this enables different types of institutions (such as a pension fund and an insurance company) to act as a limited partner on the same private equity fund. Second, where regulations are harmonized across countries, institutional investors from different countries are better able to act as institutional investors for the same private equity limited partnership. There are at least two issues which are central to every asset allocation strategy: (1) the strategy must be able to stand up to regulatory scrutiny pursuant to stringent regulations which addresses funding and solvency requirements (these issues are addressed below in subsection 2.3), and (2) the strategy must achieve a balanced portfolio with risk diversification as the objective. An institutional investor needs to account for its unique features and client or beneficiary demographics in the development of the institutions' strategic asset allocation techniques (such as matching its assets and liabilities). Long term plans also need measures to make specific adjustments to cater for market movements and regulatory modifications.

Institutional investors' commitments to private equity funds are regulated in terms of the proportion of assets that institutional investors can contribute to private equity fund managers. In the U.S., for example, Gompers and Lerner (1998b) show in their seminal paper on venture capital fundraising that changes in the interpretation of the prudent man standards for pension funds significantly increased their capital allocations to private equity funds. The empirical analyses in this paper focus regulatory harmonization in Europe, with a focus on The Netherlands. Relevant regulatory harmonization measures are discussed in the next subsections.

2.1.1. The FTK

In 2006, a new supervision framework by the pensions and insurance supervisory authority of the Netherlands, Pensioen & Verzekeringskamer ("the PVK"), will come into effect for Dutch pension funds and insurers. The three pillars of the FTK are (1) continuity test: tests the development of the solvency in the long run; (2) solvency test: tests the financial position related to the risks associated with the assets and liabilities on a one-year horizon; and (3) minimum test: tests if the present value of the assets is at least equal to the present value of the liabilities.

For most pension funds, the risky part of the investment portfolio consists of public equities. The disadvantage of an investment policy that only includes equities is that when stock markets decline the pension fund's financial position will decrease accordingly. The diversifying nature of alternative

investments can mitigate this effect significantly. The results is that the required financial buffer for the solvency test will be lower than when the fund only responds to one risk factor. Prior to the implementation of the FTK, the regulations in The Netherlands made use of separate criteria for different asset classes, thereby neglecting the correlation across asset classes. The change that the FTK will bring is that it will assess risk models across the *entire* portfolio of a financial institution. Therefore, portfolio diversification is more important under the FTK. This will stimulate demand for alternative investments (such as private equity) that have a low correlation with traditional asset categories. Moreover, for pension funds and insurance companies, alternative assets (such as private equity) like will enable a better matching of the present value of assets and liabilities.

Along with numerous changes in supervision and in accounting rules for institutional investors under the purview of the PVK, an important change the FTK will bring is that instead of calculating the net present value of the institutions' liabilities using a fixed discount rate as is the current practice, both assets and liabilities of the institution will be valued on a marked-to-market basis. As a result of this, it is thought that a majority of Dutch institutional investors may be forced to revamp their existing asset and liability management techniques (or asset allocation strategies) to take into account the risk profile of an institution's entire asset portfolio in relation to its liabilities.

The change that the FTK will bring to the Dutch marketplace will largely be related to an increased focus on the matching of assets and liabilities and portfolio diversification. While this may for example result in a shift out of equities into bonds, especially into long-maturity bonds and into inflation-linked bonds (to meet future long term inflation linked liabilities), the search for diversification should result in increased demand for alternative investments, with private equity falling within this category since private equity horizons match those of pension funds and life insurance companies.

2.1.2. The IFRS

The objective of the IFRS is to ensure that the financial statements of all listed companies adequately reflect the losses that are incurred at the balance sheet date. From 1 January 2005, all listed companies in the European Union ("EU") are required to apply the IFRS when preparing their consolidated financial statements. The Dutch went one step further and in February 2005, the Lower House of the Dutch Parliament approved a bill encouraging Dutch *unlisted* companies to apply the IFRS. The implementation of the IFRS in 2005 will serve to only increase the probability of an institution needing to revamp at its asset and liability management practices.

Differences in accounting practices can occur for a number of reasons. For example, many private equity funds are conservative in their assessments and value investments at cost until the investments are realized. Other funds – particularly first-time funds – may be aggressive in their valuations by not writing down poorly performing companies or even overstating the value of ongoing ones, especially in difficult times (see Gompers, 1996; Blaydon and Wainwright, 2005). These differences in assessed values induce little confidence in the reported values and the Internal Rates of Return ("IRRs") of private equity funds (Gompers and Lerner, 1998a). So with standardize accounting for both listed and unlisted companies, institutions will have to fairly report private equity investments and private equity fund managers will in turn be incentivised to report their positions fairly. The IFRS therefore potentially facilitates private equity investment by harmonizing reporting standards in private equity, particularly for the reporting of investments in unexited private portfolio companies (see also EVCA/PriceWaterhouseCoopers, 2005).

2.1.3. Basel II

Basel II encompasses three pillars. Pillar 1 covers minimum capital requirements, specifically new rules for credit and operational risk; Pillar 2 covers supervisory review; and Pillar 3 covers market discipline, particularly in relation to reporting standards and disclosure.

Regarding Pillar 1, Basel II's main objective is to ensure that a bank (within the EU, financial investment firms are included) has sufficient provisions or capital to support its expected losses and support any unexpected credit losses. The decision in October 2003 by the Basel Committee on Banking Supervision to remove expected losses from the risk weight functions in the Internal Ratings-Based approach, which is based upon a long-run average twelve month probability of default and the bank's most conservative estimate of 'loss given default' across an economic cycle, has been driven by its belief that provisions should reflect a bank's *expected* credit losses whereas capital should principally reflect any *unexpected* losses that may arise. While this may not directly affect the asset allocation per se, the increased credit risk mitigation and increased operation risk overview will. From 2004, institutional investors affected by Basel II would have been, and may still be, adjusting to the various changes required of them regarding their internal risk management, especially their internal processes used to assess capital adequacy and allocate capital/assets, including the related greater public disclosure requirements.

Regarding Pillar 2, institutions are scrutinized for the overall capital under the new bases in relation to their risk profile, as well as allocating their economic capital. Basel II will also require returns to be assessed for individual businesses against the capital used.

Regarding Pillar 3, institutions will face increased levels of disclosure over and above that which is currently (pre-Basel II) required by Accounting Standards anywhere in the world. Increased disclosure covers areas that include quarterly reports, investor relations, and loss data by business line. The overall intent is to improve risk management practices.

Overall, we may hypothesize that Basel II will enhance institutional investor participation in private equity for the following reasons. An institutional investor will look at its asset allocation strategy to determine its efficiency. Diversification is required, which should increase in private equity, which will provide better returns then the stock markets. Caution will be taken during the decision making process as the internal processes are increasingly scrutinized, if not by Basel II, but by those customers who agree with Basel II objectives. This additional cautionary behavior will follow through not only from that initial decision, but also with a view of the nature of information that will have to be disclosed to the public under the Basel II (as well as under IFRS, discussed above). Even if the institution is not obliged by Basel II, its clients and beneficiaries who agree with the Basel II objectives will expect to see similar practices within other comparable financial institutions (it is more likely for a person to be a client of a bank than a client or beneficiary of a pension fund or insurance company).

2.2. The Dearth of Private Equity Fund Regulation

Institutional investors' commitments to private equity are influenced in terms of the reports that institutional investors receive from private equity funds in terms of fund performance, and in terms of institutional investors' ability to in turn disclose such reports to their own clients and beneficiaries (e.g., pensioners in the case of pension plans, etc.). Prior to the CalPERS lawsuit in California, private equity funds enjoyed complete secrecy in terms of their disclosure of their performance to the public generally, and reports by private equity funds to their institutional investors were not regulated. The effect of a comparative dearth of regulations in private equity on the flow of funds into the private equity market cannot be known without empirical scrutiny, particularly in light of the debate surrounding the topic. On one hand, a lack of regulations in private equity may facilitate the flow of funds into private equity as it enables needed flexibility for the funds to carry out their investment activities without interference from regulatory oversight and reporting requirements. Private equity funds and commentators often put

forward this view in the popular press.[7] Private equity funds have been vigorously opposed to disclosing their performance figures to the public, and to standardization setting of reports that they provide to their institutional investors.[8] On the other hand, the comparative dearth of regulations in private equity and lack of reporting standards may disincentivise institutional investors to contribute capital to private equity funds. Institutional investors often put forward this view,[9] and some pension funds have been forced to rethink their investment strategy into private equity funds.[10] In the empirical analyses below we assess these competing conjectures on the effect of a comparative dearth of regulation of private equity funds on the flow of funds into the private equity market.

2.3. Summary

In sum, harmonization of regulations faced directly by institutional investors facilitates investment in private equity through enabling different types of institutional investors to act as limited partners for the same private equity fund, and by enabling different institutions in different countries to act as limited partners in private equity funds. Relevant harmonization measures for Dutch institutional investors include the FTK, IFRS and Basel II, as discussed in subsection 2.1. Subsection 2.2 thereafter considered the influence of a dearth of regulations directly governing private equity funds. On one hand, the dearth of regulations may facilitate investment by providing the requisite flexibility. On the other hand, the dearth of regulations may increase risks, contracting costs and barriers to entry for institutional investors to participate. The next sections empirically consider these issues for the first time.

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[7] See, e.g., "Capital ideas" in The Monitor Blue Skies Capital Ideas 4/09/2005 at http://www.epolitix.com/EN/Publications/Blue+Skies+Monitor/ <accessed 1 August 2005> (arguing that money flow into private equity is hampered by regulations in the UK, and facilitated by a dearth of regulations in continental Europe). It has also been argued that new UK disclosure laws are making private equity groups uncomfortable by Henry Tricks "Throwing Open a Secretive World" (Financial Times, page 20, 17 January 2005), and by John Mackie "Private Equity: An open-and-shut case for transparency complaints about the secretiveness of the private equity industry are at odds with its regulatory procedures" (Financial Times, page 10, 18 April 2005), and by Martin Dickson "UK: Time for faceless face of capitalism to grow up" (Financial Times, page 18, 24 August 2005). See also Andrew Hill "Blurred Distinctions in the Fund Industry" (Financial Times, p.6, 12 September 2005) arguing that over-strict regulations hampers the expansion of investments in other alternative asset classes.

[8] For example, see, http://www.ventureeconomics.com/vec/1031550742742.html <accessed 11 January 2004>. The CalPERS lawsuit forced private equity funds in the United States to disclose returns among public institutional investors; as a result, some private equity funds have restricted participation from such public limited partners; for example, Sequoia Capital ejected the University of Michigan as an institutional investors in its funds (see http://www.mercurynews.com/mld/mercurynews/business/6390139.htm <accessed 11 January 2004>).

[9] The Institutional Limited Partners Association in the US, for example, has been working towards setting standards for reports from venture capital and private equity funds. The National Venture Capital Association (NVCA) in the US recently (as at 3 March 2004) rejected a proposal by the Private Equity Industry Guidelines Group regarding valuation guidelines, creating controversies among the Institutional Limited Partners Association and other industry associations; see http://www.privateequityonline.com/TopStory.asp?ID=4498&strType=1 <accessed 4 March 2004>.

[10] For example, CalPERS has been forced to reconsider its private equity allocations, and in ways that differ relative to what it might otherwise have done but for the public disclosure; see http://www.ventureeconomics.com/vcj/protected/1070549534318.html <accessed 11 January 2004>

3. Data

3.1. Methods and Survey Instrument

The data assembled for this paper are derived primarily from a survey of Dutch institutional investors carried out between February 2005 and May 2005. This use of surveys was necessary for the nature of information analyzed in this paper. Data on past and current institutional asset allocation and investment levels in private equity do exist from some venture capital associations and annual financial reports,[11] but other information such as projected or future asset allocation, investment objectives and private equity investment selection criteria are not available in the public domain. More significantly, we sought to determine the effect perceived risks and hurdles in private equity investing had on institutional investment behavior. The relative importance of such perceived risks and hurdles, including poor product knowledge[12], complex terms and conditions, long time horizons, limited liquidity[13], lack of transparency, and lack of market-wide accepted performance benchmarks could, in our opinion, only be obtained by survey. Also, a complementary issue that we sought to determine from our survey exercise is the effect new regulations and proposed regulatory changes within The Netherlands have on institutions. To verify and enhance data obtained by the survey, follow up interviews were carried out and where possible, reference was made to institutions' web sites and publications.

The instrument we used to obtain the detailed data required about current and projected Dutch institutional investor asset allocation, particularly private equity participation, is a 13 page questionnaire, comprising 32 questions. Robustness is achieved chiefly by framing questions in a way that calls for numeric responses, or a simple "yes" or "no" response. In view of the fact that the potential respondents, while financial institutions, are from different branches of finance, a glossary of terms was provided in the survey to ensure uniformity in defining terms which may not necessarily be used in the same manner across sectors. An overview of the information collected is summarized in Table 1 which defines the primary variables used in this study.

[Insert Table 1 About Here]

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[11] See, e.g., www.evca.com for European data and www.nvp.nl for Dutch data.

[12] Despite the important role of private equity in financing and fostering innovative firms, and in reallocating capital to more productive sectors of the economy, relatively little is known about the key characteristics of private equity as an asset class: liquidity, risk, and return.

[13] Private equity investment is essentially illiquid (Sahlman, 1990, Lerner and Schoar, 2005). For related theoretical and empirical work, see Bascha and Walz (2001a), Berger and Udell (1998), Bergman and Hege (1998), Casamatta (2003), Hsu (2004), Litvak (2004), Mayer (2001), Schmidt (2003), van der Goot (2003), Rupello and Suzrvez (2004).

3.2. Potential Sample Selection Bias

The potential respondents, the population of institutional investors in The Netherlands, were identified from various sources including, but not limited to the following:

1. Pensioen & Verzekeringskamer (Pensions and insurance supervisory authority of the Netherlands, PVK);
2. De Nederlandsche Bank (Dutch Central Bank, DNB)
3. Autoriteit Financiële Markten (The Netherlands Authority for the Financial Markets, AFM)
4. The Dutch Private Equity and Venture Capital Association (NVP) and the EVCA; and
5. Web sites of Dutch financial institutions.

Pursuant to identifying the appropriate contact persons, the survey instrument was sent to approximately 1114 Dutch institutions, comprising:

a. 797 Pension Funds[14], including company pension funds, industrial pension funds, and occupational pension funds;
b. 205 Insurance companies[15]; and
c. 112 Banks[16], including Universal Banks, Securities credit institutions, Savings banks, Mortgage banks.

Participation was chiefly solicited with the promise that the aggregated survey results would be disseminated to respondents. Only one questionnaire was disseminated in hard copy by mail to each institution, and addressed specifically to the institution's Chief Investment Officer or an equivalent manager of private equity investments for an institution where such contact details are available.

[14] All types of pension funds were included to mitigate response bias. As of 2004, all pension funds in the Netherlands had assets at €442 billion, with Dutch company pensions having assets of over €141 billion Pension funds with assets below €1 million have however been excluded (954 in total) primarily because the possibility of sample selection bias is mitigated by the breadth of asset size of the pension funds that were sent survey questionnaires. Of the 797 pension funds surveyed, 524 have assets between €10 million to €1 billion. A majority of those have assets less than €100 million. 34 Pension Funds control assets between €1 billion and €5 billion, while 12 have more than €5 billion within their control.

[15] Those institutions within this category but described as institutions with an office in the Netherlands, or with unrestricted services to the Netherlands and mutual benefit companies have not been included. While their inclusion will increase the approximate figure provided to 1916, they are not deemed as Dutch institutions for the purposes of this study. As in the case of the target pension funds, we believe that the breadth of asset size of the insurance companies that were sent survey questionnaires mitigate any possible sample selection bias. Of the number surveyed, 32 have assets between €100 million and €1 billion, 27 have more than €1 billion and 29 have less than €100 million.

[16] Non-EU and EU bank branches have not been included.

One limitation to obtaining data through a survey is the possibility of sample selection bias. While we acknowledge that this is a possibility, we believe from a detailed analysis of the responses received and the data obtained from the responses that this concern does not arise in this exercise. First, survey data were gathered for a final sample of 100 institutional investors comprising company pension funds, industrial pension funds, occupational pension funds, life and non-life insurance companies, banks and other financial service providers. Our sample of respondent institutions includes 56 pension funds, 25 insurance companies, and 19 banks and other types of financial service providers (see Table 2). Limitations in our sample size from each sector of the finance industry from which we derived data, as well as the limited information about comparable academic work on institutional investor behaviour in private equity, however, makes reliable statistical comparisons of our sample relative to the population of other types of investors in private equity intractable.

[Insert Table 2 About Here]

Second, a broad array of respondents replied to the survey. For example, the data show the median respondent asset size of €800,000,000 and the average being €4,665,000,000, indicating respondents were of a variety of asset sizes. We did not find a statistically significant difference between average assets of respondents versus non-respondents. The possibility of sample selection bias is further reduced by the presence of institutions that do not currently allocate any of their assets to private equity, and do not plan to allocate any up to 2010, institutions that plan to increase current allocations in the near future and also institutions that plan to reduce allocations by 2010.

We unfortunately realise that we cannot absolutely rule out the possibility of a response bias due to the unique nature of the data collection. The survey design and motivation for the survey was initially to determine which Dutch institutions currently allocate, and plan to allocate, capital to private equity. In this regard, the survey instrument also had to provide for allocations to all other types of assets to enable us to determine which asset classes would "lose out" to any future proposed re-allocations to private equity. Note that questions pertaining to regulation (among other things) were added to the more primary questions regarding asset allocation hence, we believe our sample does not *only* comprise those institutions interested in private equity regulations.

The data comprise a significant number of detailed variables which are described below in the next subsection.

3.3. Summary Statistics

The data indicate that the 100 institutional investors comprising pension funds, insurance companies, banks and other financial institutions invested on average 1.09% of their assets in private equity as at 2005, and planned on investing 1.44% of their assets in private equity over the period 2006 – 2010 (Table 2 Panel B). Out of these 100 institutions, 19 plan on (over the range 2006 – 2010) investing on average more than 2.5% of their assets in private equity, 10 plan on investing more than 5% of their assets in private equity, and 6 plan on investing more than 7.5% of their assets in private equity. Total private equity investment accounted for approximately €10.5 billion as at 2005.

The data also enable consideration of investment direction in respect of which regions the institutions will be investing in future, and by how much and what mode (direct company investment, direct fund investment and fund-of-fund investment) (Table 1). It should be noted that some large Dutch funds appear to invest a significant fraction of their private equity allocation outside The Netherlands. Three institutions plan to allocate all of the private equity investments in Europe outside of the Netherlands, one institution plans on allocating all of their private equity investment in the U.S., one institution plans on allocating 1/3 of their private equity investments in Asia.

Figure 1 highlights the importance of regulatory factors for institutional involvement in private equity for those institutions (35 in total) that will be invested in private equity between 2006 to 2010. The institutions in the sample ranked the FTK as the most important regulatory development for the participation in private equity markets (an average ranking of 3.4 based on a scale of 1 to 5, where 5 is the most important). By contrast, the comparative dearth of regulations in private equity received an average ranking of 2.8, the IFRS received an average rank of 2.7, Basel II received an average rank of 2.2, and Dutch reform of bankruptcy laws (1997-1999)[17] received an average rank of 2.0.

[Insert Figure 1 About Here]

Figure 2 depicts the perceived risks and hurdles perceived by those institutions that will be invested in private equity in 2006 – 2010. On average, the most important risk faced by institutional investors is the illiquidity of the investment (ranked an average of 3.7 on a 1 to 5 scale where 5 is the

[17] Dutch bankruptcy laws were radically reformed in the period from 1997 to 1999. There was no discharge from debts in bankruptcy in 1997, but this was changed to a 3 year time to discharge in 1999. Based on pan-European aggregate industry private equity data from 1990-2002, it is estimated that this change has inspired an increase in the demand for early stage venture capital transactions by 0.009% of GDP in The Netherlands; it is further estimated that a reduction in time to discharge in bankruptcy by one year increases institutional investor fundraising by 0.03% of GDP. See Armour and Cumming (2005).

highest). Private equity investments can take many years to bring to fruition (typically at least 7 years) in an exit event. Other important risks associated with private equity investment include lack of performance transparency, risk of default, lack of know-how, and governance costs (governance costs are also significant for publicly traded companies; see, e.g., Cremers and Nair, 2005).

[Insert Figure 2 About Here]

As a related matter, there are legal and contractual issues with establishing private equity funds, and writing these contracts is viewed as a major hurdle to private equity investment (ranked an average of 3.4 on a scale of 1 to 5). The most common form of organization of venture capital and private equity funds in the U.S. has been a limited partnership structure that typically lasts for 10 years, with an option to continue for an additional 3 years to ensure the investments have been brought to fruition and the fund can be wound up (Sahlman, 1990; Gompers and Lerner, 1996, 1999). Other countries around the world that allow limited partnership structures have likewise made use of such structures.[18] Countries that do not allow limited partnership structures have made use of corporate forms that closely resemble limited partnerships in the covenants governing the partnership.[19]

As discussed in section 2, there are significant contracting hurdles for successful investment in private equity. Such contracts are necessary because private equity fund managers are not formally regulated by statute. Institutions must write their own contracts, and view such an activity as a barrier to investing in private equity. Figure 2 indicates this barrier (ranked at 3.4 on average) is nearly as important as the illiquidity problem (ranked at 3.7).

Table 3 elaborates on the risks and hurdles faced by institutional investors in private equity. Ranking are provided for all types of institutions (pension funds, insurance companies and banks) in the data in Table 3. It is interesting to note that the average rankings for financial factors in Table 3 Panel B are higher for banks, while other factors pertaining to risk reduction and portfolio balancing are ranked highest for insurance companies. Table 3 Panel C indicates banks on average rank the importance of Basel II to be most important. The banks in the sample also tend to rank the other regulatory changes higher than the rankings provided by pension funds and insurance companies; however, pension funds and insurance companies are relatively more likely to give the FTK and IFRS higher rankings than Basel

[18] For example, for funds in Europe, see www.evca.com.

[19] Australia, for example, has only allowed limited partnerships since 2003; prior to that time funds were set up as trusts, but functionally these trusts involved rights and responsibilities that mimicked the limited partnership structure; see Cumming *et al.* (2005).

II, which is expected given FTK and IFRS are more directly relevant to pension funds and insurance companies than Basel II.

[Insert Table 3 About Here]

3.4. Difference of Means and Medians Tests and Correlation Matrix

Table 4 presents difference of means and medians tests for the subsample of institutional investors that do plan (as at 2005) on investing in private equity in 2006 – 2010 versus those that do not plan on making such investments. The comparison tests are a useful preliminary look at the data to understand how the characteristics of the two populations of institutional investors differ. The next section below considers the robustness of these differences while controlling for other factors in a multivariate setting with sensitivity to robustness checks.

[Table 4 About Here]

The data indicate a number of statistically significant differences between investors that do and do not plan on investing in private equity. First, the mean and median level of assets is much higher among those institutional investors that do plan on investing in private equity. This result is expected because smaller institutions are required to adhere to capital adequacy ratios such that the contract and monitoring costs of investing in private equity may outweigh benefits for smaller scale investments. Moreover, smaller institutions are less likely to have access to the top performing funds (Lerner *et al*., 2005).

Second, the institutions' rank of the degree of the importance of a comparative dearth of regulations in private equity is higher for those institutions that do not plan on investing in private equity than those institutions that do plan on investing in private equity (the mean difference is marginally insignificant at the 10% level of significance, while the median difference is statistically significant). This indicates that the contracting and screening costs of writing and negotiating limited partnership covenants and pay structures (as first analysed by Gompers and Lerner, 1996, 1999) are a barrier to investing in private equity, and this barrier outweighs the drawbacks of more formally regulated asset classes. As mentioned in section 2, it is noteworthy that among practitioners there is a feeling (conveyed in 2005) in European markets that a private equity "bubble" is forming. Private sector feeling is that this may in part be due regulatory distortion; i.e., that money is moving into this area of the market to avoid

the strictures of regulation in the more established and more heavily regulated asset classes, or taking advantage of regulatory arbitrage. The data indicate this is not the case.

Third, the introduction of legislation designed to bring about clarity and harmonization in the ways institutional investors are regulated (via FTK, IFRS and Basel II) all increase the likelihood that an institutional investor will invest in private equity. More specifically, the data indicate that institutions that place greater importance of such regulations generally are more likely to invest in private equity. Note that while Table 4 does not indicate which measures for harmonisation give us the "biggest bang for the buck", the tests carried out in section 4 below consider that issue of the relative importance of different pieces of legislation in more detail.

Fourth, as would be expected, Table 4 indicates that those institutions that expect a higher return from investing in private equity are more likely to invest in private equity.

Table 5 provides a correlation matrix across a number of different variables to shed further light on the univariate relations in the data. Generally speaking, the correlations provide further support for the comparison tests presented in Table 4 and described immediately above. Asset size again appears to be an important determinant of the decision to invest in private equity; specifically, larger institutions were more likely to invest in private equity. It is noteworthy in Table 5 that pension funds rank the importance of Basel II and the IFRS as being less important, while banks rank them as being more important. Insurance companies are less likely to make direct company investments. The different types of regulatory harmonization efforts are all positively associated with higher percentages of fund-of-fund investments. A variety of other correlations in Table 5 provide insight into the relations between the variables.

[Table 5 About Here]

Table 5 also indicates areas of potential concern regarding collinearity among variables. This collinearity issue is relevant for the multivariate analyses presented in the next section, and the presentation of the regressions is done in a way to show robustness across the inclusion/exclusion of those variables that exhibit a high degree of collinearity.

4. Multivariate Analyses

This section carries out a number of regression analyses which are presented in Table 6. Table 6 is broken down into 5 panels. Panel A of Table 6 presents logit analyses of the probability that an institutional investor will allocate capital to private equity. Panel B is similar to Panel A, with the exception that Panel B uses the subsample of pension funds and insurance companies while Panel A uses the full sample including banks. Panel C presents OLS regression analyses of the percentage of capital to be allocated to private equity funds in 2006to 2010 across the institutional investors in the sample. Panel D presents analyses of regional differences in private equity allocations. Panel E presents analyses of different forms of private equity investment, including direct company investment, direct fund investment and fund of fund investment.

[Insert Table 6 Panels A – E About Here]

Note that all of the regressions use White's (1980) robust standard errors. As well, note that the regressions with the dependent variable is a percentage term (Panels C – E of Table 6), the left-hand-side variable is transformed so that it is not bounded between 0 and 100%, in a standard way of modeling fractions (see, e.g., Bierens, 2003), so that the residuals and estimates have properties consistent with assumptions underlying OLS. Specifically, if Y is a dependent variable that is bounded between 0 and 1 (i.e., a fraction), then a possible way to model the distribution of Y conditional on a vector X of predetermined variables, including 1 for the constant term, is to assume that

$$Y = \frac{\exp(\beta' X + U)}{1 + \exp(\beta' X + U)} = \frac{1}{1 + \exp(-\beta' X - U)}$$

where U is an unobserved error term. Then

$$\ln(Y/(1-Y) = \beta' X + U$$

which, under standard assumptions on the error term U; can be estimated by OLS.

Further, note in Table 6 Panel C (Model 12) and Panels D and E (Models 13 – 18) that the regressions make use of the Heckman (1976, 1979) correction. That is, we first consider the probability that the institutional investor invests in private equity, and then consider the fraction of investing in private equity (Model 12), and in a specific region (Models 13 – 15). Similarly, in Models 16 – 18 we first consider the probability of investing in private equity and then the mode in which private equity investments are carried out (such as by direct company, direct fund, or fund-of-fund investments). These Heckman corrections are important robustness checks for Panels C – E of Table 6 as the statistical

properties of the subsample of institutions that invest in private equity may systematically differ from the institutions that do not invest in private equity; as such, it is important to control for those differences instead of independently examining the subsample of institutions that do invest in private equity. The results are quite robust to alternative specifications (different specifications not presented are available upon request).

The regression estimates in Table 6 Panels A – E data indicate a number of interesting findings. First, institutional investors do not invest in private equity because there is a comparative dearth of regulations in private equity. The comparative dearth of regulations in private equity is a barrier to Dutch institutional investor private equity investment.[20] In particular, the data indicate that an increase in the ranking of the importance of a comparative dearth of regulations in private equity by 1 on a scale of 1 (lowest importance) to 5 (highest importance) reduces the probability that the institutional investor will invest in private equity at least 17%.[21] This effect is also statistically significant and economically significant for the subsample of pension funds and insurance companies (Table 6 Panel B).

Table 6 Panel C estimates the actual percentage of total assets that an institution allocates to private equity. The data indicate that an increase in the rank on a scale of 1 (lowest importance) to 5 (highest importance) by 1 decreases the amount invested by up to 1% of all of the institutions' total assets. The economic significance is thus quite large. The lack of regulations coupled with the high risk and illiquidity in private equity gives rise to extra screening, governance and contract costs, which in turn requires specialized skill to participate in the private equity asset class; therefore, institutions that consider the comparative dearth of regulations in private equity to be more important for their investment allocation decisions are in fact less likely to invest in private equity.

The FTK, IFRS and Basel II regulations all appear to facilitate investment in private equity, and cross-border investments in private equity. Note that our data comprise Dutch pension funds, insurance companies and banks. The data indicate that an increase in the ranking of the importance of these regulatory harmonization measures (on a scale of 1 to 5 where 1 is the lowest measure and 5 is the highest measure) increases the probability that the institutional investor will invest in private equity by at least 16%. As with the variable for the dearth of regulations in private equity, the economic significance of the regulatory harmonization variables depends on the other included right-hand-side variables (although the

[20] Alternative right-hand-side variables such as for specific concerns in regards to reporting standards (as summarized in Figure 2) were also considered, and yielded very similar regression results (available upon request). Separate variables for these factors are not used due to collinearity problems.

[21] The estimated economic significance is as large as 57% in Model 4, and varies depending on the specification of the model. The marginal effects for the logit models were calculated using Limdep Econometric Software.

statistical significance is robust to the inclusion/exclusion of different right-hand-side variables). These estimates are quite robust to the inclusion or exclusion of banks in the sample (Table 6 Panel B).

In regards to the actual percentage allocated to private equity in different regions, the data indicate in Panel D of Table 6 that an increase in the ranking of these regulatory changes on a scale of 1to 5 by 1 point increases the amount invested in private equity in The Netherlands by up to 0.7% of an institution's total assets (Model 13 for the IFRS variable only), and increases the amount invested in private equity in Europe outside The Netherlands by up to 0.8% of an institution's total assets (Model 14 for the Basel II variable only). Similarly, Panel E of Table 6 indicates that an increase in the ranking of the importance of these harmonization efforts on a scale of 1to 5 by 1 point reduces the amount invested by way of direct fund investments by up to 0.8% of an institution's total assets (Model 17 for FTK), and increases the amount invested by way of fund-of-fund investments by up to 0.6% of an institution's total assets (Model 18 for Basel II). Note, however, that the statistical and economic significance of the Panel D and E multivariate estimates is highly sensitive to the included variables in the regression models. This is largely due to the smaller sample sizes in Panels D and E (35 observations, instead of 100 as in the other specifications that involve the full sample), and the fact that some of the variables are collinear (as indicated in Table 5). Further evidence with larger datasets and a greater number of countries could provide additional fruitful insights. Nevertheless, consistent with the univariate correlations, the econometric evidence in Table 6 is indicative that the degree of importance of regulatory harmonization to an institutional investor does affect the investor's propensity to invest in private equity as well as the location and mode of investment.

The econometric evidence in Table 6 indicates there are some differences in the importance of these regulatory changes depending on the type of financial institution (pension fund, insurance company or bank). However, these differences are not very pronounced. A likely explanation is that these regulations are at least indirectly related to all of the institutions' portfolio management decisions in our dataset (see section 2 for a more in depth discussion). Overall, therefore, the data do offer support for the view that regulatory harmonization facilitates private equity investment in the multivariate regression evidence in Table 6 (as well as the univariate comparison tests in Table 4 and the correlation statistics in Table 5).

The regression evidence in Table 6 Panels A – E also indicates other factors affect allocations to private equity, including the institutions' asset size, returns expectations, corporate objectives, portfolio diversification objectives, and views on the importance of achieving a yearly rate of return to report to

their own beneficiaries. The data indicate larger institutional investors are more likely to invest in private equity (and this is modeled at a diminishing rate): an increase in the assets managed by an institutional investor from €1 billion to €2 billion increases the probability that an institutional investor will invest in private equity by about 5%, while an increase in assets from €10 billion to €11 billion increases the probability that an institutional investor will invest in private equity by 1% (Table 6, Panels A and B). Among those institutions that do plan of investing in private equity in 2006 to 2010, larger institutions are more likely to invest in the U.S. and less likely to invest domestically (Table 6 Panel D).

Other control variables are also significant in ways that are expected. For example, institutions that expect greater returns from private equity relative to the public equities markets are also more likely to invest in private equity (Table 6 Panels A and B). Particular characteristics unique to the institutions in our dataset are also important for the mode of investment: institutions that have strategic corporate objectives are more likely to invest directly in a private company (Table 6 Panel E), while fund-of-funds investments are more likely for institutional investors that seek diversification and consistent annual returns to report to the institution's clients or beneficiaries (Table 6 Panel E).

5. Why do Incumbent Private Equity Fund Managers Oppose Mandated Disclosure?

The data from institutional investors documented in the prior sections support the view that more disclosure would bring in more money into private equity. Regardless, private equity fund managers vigorously oppose higher disclosure standards (see subsection 2.2 above). This gives rise to an important question: if private equity funds realized these results, then would they not want to voluntarily disclose? Several reasons suggest that they may not want to voluntarily disclose in the absence of regulation mandating disclosure. First, certain private equity funds may not be aware that increased disclosure will increase capital commitments from institutional investors. This is particularly true in reference to private equity funds that do not have a relationship with institutional investors that have never been invested in private equity, who would otherwise contribute capital to the asset class but for the comparative dearth of mandated disclosure.

Second, disclosure imposes additional administrative costs of reporting, and such costs may exceed the benefits of additional deal flow (the number of deals referred to private equity fund managers by entrepreneurs). As a related matter, disclosure potentially discourages deal flow from entrepreneurial firms seeking capital, as entrepreneurial firms may not want public reporting of their financing terms (and performance) from their private equity investors. The benefits of disclosure in terms of raising additional

capital from their private equity funds may be outweighed by the costs in terms of the quantity and quality of deal flow. In reference to the first point, private equity investors are unlikely to be able to quantify the benefits versus costs of increased disclosure as there has not been a prior history of mandating greater disclosure and the effect that has had on the market. This study is the first attempt to empirically assess the benefits of increased disclosure in terms of facilitating greater capital commitments from institutional investors to private equity funds (although the costs of increased disclosure have not been empirically quantified).

Third, disclosure may disproportionately benefit nascent private equity fund managers relative to more established private equity fund managers. It is well established that there is persistence in the performance of venture capital and private equity fund returns (past performance is the best predictor of future performance). Established funds with a successful track record do not have problems raising additional capital for follow-on funds; in fact, established funds typically have long wait lists among institutional investors that would like to invest. Hence, greater disclosure disproportionately benefits newly established private equity funds relative to established funds. Existing well established private equity funds have an entrenched interest to avoid disclosure as a way to enforce a barrier to entry against new private equity fund managers.

Fourth, greater private equity fund disclosure is a benefit to not merely the institutional investors, but rather, it is a benefit to the clients or beneficiaries of the institutional investors. For example, consider the main type of institutional investor for private equity funds: pension funds. Pension plan beneficiaries are not sophisticated investors, and they have a legal right to have access to the investment decisions made on their behalf, at least as per the CALPers' decision at common law. Information on the performance of a pension plan is relevant for retirement and savings decisions, among other things. Private equity funds do not take this into account in their decision as to whether they would like to disclose. Institutional investors, by contrast, do take this interest of their clients and beneficiaries into account. For instance, with the most recent case brought against the Ohio Bureau of Workers Compensation on an issue similar to that raised by CALPers,[22] it is becoming clear that even larger and sophisticated institutional investors such as pensions and insurance funds are interested in incorporating more disclosure based transparency in the discharge of their fiduciary duties as trustees of their customers' pensions and insurance premiums.

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[22] Pursuant to rigorous debate on this issue, 43 of Ohio Bureau of Workers Compensation's private equity fund managers filed a complaint for a declaratory judgment regarding the release of a report on the value of its private fund investments that managers have argued should be kept private and confidential due to the sensitive nature of the information. See http://hosting.mansellgroup.net/enablemail/ThomsonNewLetter/HostedWires/NewsLetters/Jan19-06.htm <accessed 19 January 2006>.

Government regulation of private equity fund disclosure has the potential to correct the above mentioned market failure in the private level of disclosure. While a full accounting of the costs and benefits has yet to be undertaken, the new evidence in this paper suggests that there are significant social benefits that warrant further consideration of government intervention mandating greater disclosure.

6. Future Research and Policy Issues

This paper introduced the first international dataset on the role of regulatory harmonization in driving private equity investments. As the data obtained in this paper are new and unique and extremely difficult to obtain from institutional investors, there are of course limitations in the number of observations. We nevertheless gathered sufficient details in the data to control for a variety of factors that could affect institutional investor allocations to different asset classes and to private equity. And as we have discussed in the paper, we do not have any reason to believe there are biases with regard to sample selection in the data we were able to obtain.

Our analysis focused on Dutch institutional investor allocations to private equity investment domestically in The Netherlands, Europe outside The Netherlands (our data cannot distinguish between specific countries in Europe due to the confidential nature of the data considered), the U.S. and Asia (again, we cannot distinguish between specific regions). We provided evidence that a comparative dearth of regulations in private equity is a hindrance to investment in private equity, and that regulatory harmonization via FTK, IFRS and Basel II facilitates private equity investment. Further work could consider expanding the data in terms of more closely investigating different asset classes, as well as possibly for different time periods and different countries (see, e.g., Mayer, 2001, for differences in institutional investor behavior in relation to regulations in the UK and the U.S.). The data from The Netherlands may reflect a comparative degree of skill associated with Dutch institutional investor contracting with private equity funds (see also the theoretical work of Kanniainen and Keuschnigg, 2004), alongside cultural differences and internal structures within Dutch institutional investors. Another possibility is that the data in this paper are pertinent to the period following the crash of the Internet bubble (unlike prior work on topic), a time when institutional investors are particularly concerned with regulations in private equity and venture capital. Further research across other countries is warranted so that we may better understand the global venture capital private equity market.

It is worth pointing out that our evidence on international differences focuses on the flow of capital from the institutional investor to the private equity fund (in the case of direct fund investments, or to the private company or to the fund of funds). The data do not comprise details on where the funds reinvest capital. Often, institutional investors will impose constraints on fund managers as to where capital is reinvested (Gompers and Lenrer, 1999). While this is a data limitation for the geographic analysis herein, what is most important for reporting purposes and regulation is where the private equity fund (or entrepreneurial firm, or fund of funds) itself is located, as the investment that is reported by the institutional investor is the investment made directly into the private equity fund.

The data in this paper do not directly address the normative issue of whether the flow of money into the private equity markets in response to regulatory changes is a good or bad thing for the EU financial sector integration programme. This normative policy issue is best left for further research.[23] Our analysis strictly focuses on the positive question as to how regulatory changes (specifically, institutions' perceptions of these regulatory changes) influence institutional investor allocations to private equity, and whether the comparative dearth of regulations in private equity influenced institutional investors' attitudes towards investing in private equity.

One related issue that our paper does not address is the attitude of private equity fund managers' attitudes towards the comparative dearth of regulation in private equity. The increased scope for controlling management in private equity fund management can be an attraction to private equity fund managers relative to bank managers. A private equity fund manager can write their own regulations with entrepreneurs instead of relying on the standard rights associated with share ownership. Our data suggest that institutional investors view this to be a potential agency problem that is difficult to control in contracts between institutional investors and private equity fund managers. In terms of assessing the capital flows into private equity, it is important to understand the institutional investors' attitudes (i.e., the attitudes of those that provide the source of capital) towards the comparative dearth of regulations in private equity. Further research assessing the attitudes of private equity fund managers towards the comparative dearth of regulation in private equity could provide additional insights into effective regulation to serve the interests of institutional investors, private equity fund managers and entrepreneurial firms.

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[23] Some related empirical evidence is provided by Gompers and Lerner (1996, 1998b, 1999), Jeng and Wells (2000) and Armour and Cumming (2005). For theoretical work on topic, see Keuschnigg (2003, 2004) and Keuschnigg and Nielsen (2001, 2003a,b, 2004).

Finally, it is worth mentioning that the data do not enable an examination of the question as to whether there could exist better regulatory harmonization measures that would facilitate private equity investment (other than the FTK, IFRS or Basel II). Regulation may reduce search and screening costs for investment in private equity. It would also be worth examining whether a public authority is best placed to provide this service or whether the private sector can also fill this demand (e.g., Moody's for private equity). These topics are beyond the scope of our paper and further work on topic is warranted.

7. Conclusions

In this paper we study for the first time the relation between regulation and institutional investment in private equity, more specifically the level of investment, geographic concentration and vehicle for investment. We introduced a new detailed dataset from a survey of Dutch institutional investors. The data provided strong evidence that Dutch institutional investor participation in private equity is negatively affected by the comparative dearth of regulations in private equity, primarily due to an increase in screening, search and monitoring costs associated with low disclosure standards for private equity investment.

The new data introduced herein also provided support for the view that regulatory harmonization facilitates investment in private equity, as well as international investment in private equity. In particular, the data supported the propositions that harmonization of standards from the IFRS (regulation of reporting standards and transparency), the FTK (regulation of portfolio management standards such as of matching assets and liabilities), and Basel II (regulation of risk management and disclosure standards), all gave facilitated clarity and certainty for institutions that desired to invest in private equity. While our data do not enable an examination of the question as to whether there could exist better regulatory harmonization measures that would better facilitate private equity investment, our data are nevertheless consistent with the view that the IFRS, FTK and Basel II are steps in the right direction.

The data introduced in this paper also offered insights in respect of investment in private equity in relation to the Dutch institutional investor characteristics in terms of size, returns expectations, corporate objectives, portfolio diversification objectives, and the institutions' views on the importance of achieving a yearly rate of return to report to their own beneficiaries. Further research could consider institutional investors from other countries in Europe and abroad to gain additional insights into factors that drive allocations to private equity, as well as institutional investor attitudes towards different regulations relevant to other private equity and related markets.

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Figure 1. Rank of Important Aspects of the Legal and Regulatory Environment for Private Equity Investment Strategy Among Dutch Institutions that will Invest in Private Equity 2006 - 2010

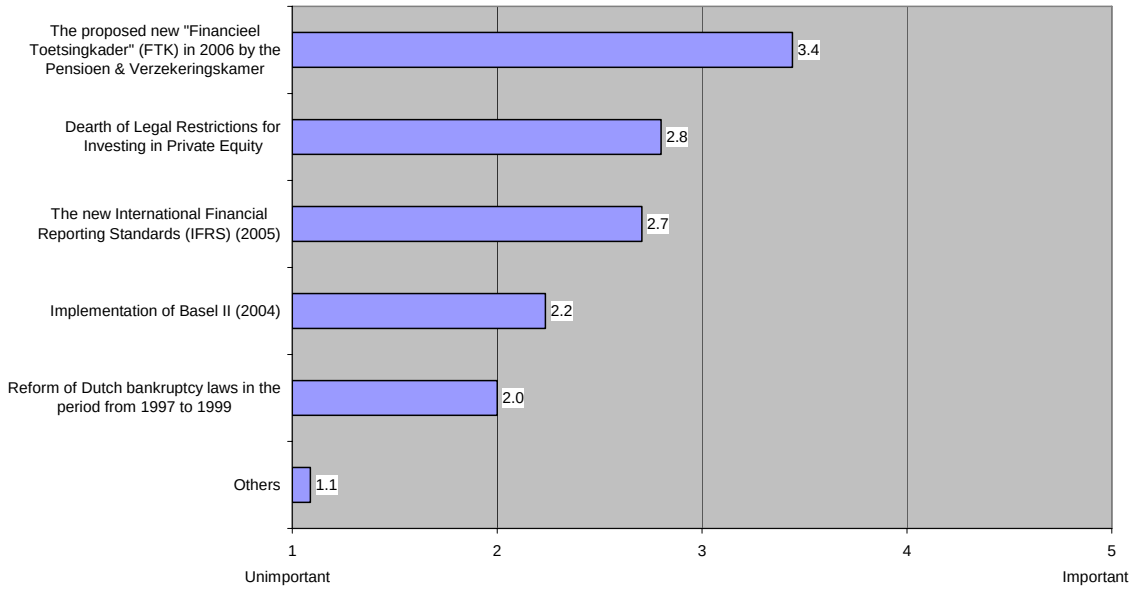

Figure 2. Perceived Risks and Hurdles Associated with Private Equity Investment Among Dutch Institutions that will Invest in Private Equity 2006 - 2010

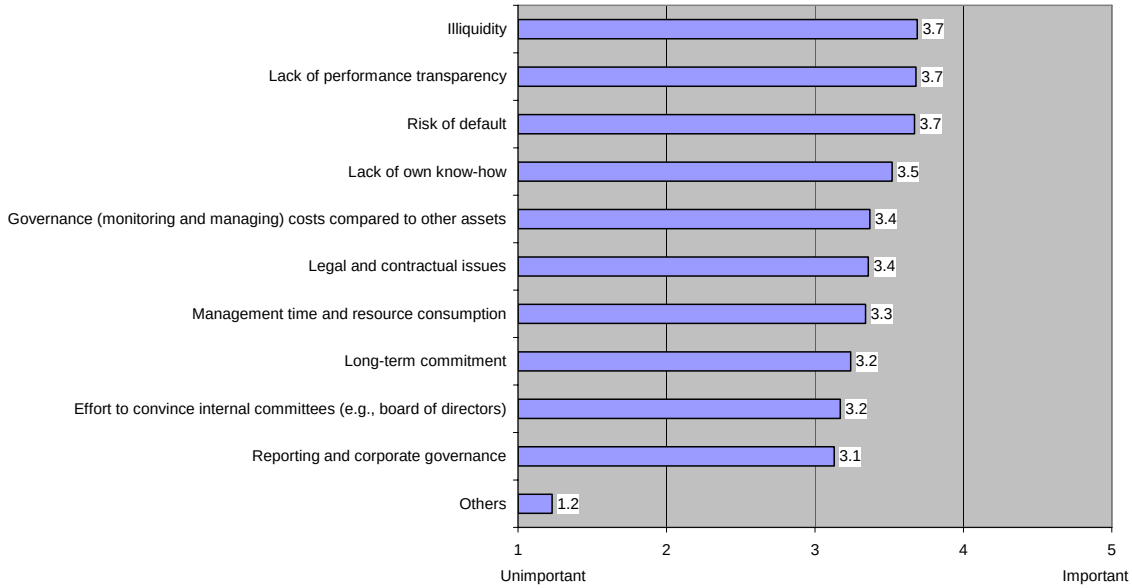

Table 1. Variable Definitions and Summary Statistics

This table presents selected variables and descriptive statistics of in the dataset of 100 Dutch institutional investors based on data from 2005. For the data on the private equity investments, the figures are presented for the subsample of 35 funds than plan on being invested in private equity over the period 2006 – 2010.

Variable Name	Definition	Mean	Standard Deviation	Median	Minimum	Maximum	Number of Observations
Pension Fund	A dummy variable equal to 1 for a pension fund institutional investor	0.56	0.50	1	0	1	100
Insurance Company	A dummy variable equal to 1 for an insurance company institutional investor	0.25	0.44	0	0	1	100
Bank / Financial Institution	A dummy variable equal to one for a bank / financial institutional investor	0.19	0.39	0	0	1	100
Assets (millions of Euros)	The total assets managed by the institutional investor (in millions of 2005 Euros)	4,753.00	9,060.41	800	300	50,000	100
All Private Equity 2006 – 2010	The percentage of the institutions' total assets invested in private equity expected for 2006 – 2010.	1.44	2.76	0	0	11.25	100
Dutch Private Equity 2006 – 2010	The percentage of the institutions' private equity investments in The Netherlands expected for 2006 – 2010.	17.49	33.61	0	0	100	35
European Private Equity 2006 – 2010	The percentage of the institutions' private equity investments in Europe excluding The Netherlands expected for 2006 – 2010.	46.89	28.79	50	0	100	35
US Private Equity 2006 – 2010	The percentage of the institutions' private equity investments in the U.S. expected for 2006 – 2010.	28.94	24.81	30	0	100	35
Asia Private Equity 2006 – 2010	The percentage of the institutions' private equity investments in Asia expected for 2006 – 2010.	2.17	6.02	0	0	33	35
Rest of World Private Equity 2006 – 2010	The percentage of the institutions' private equity investments in the rest of the world (excluding the above categories of regions) expected for 2006 – 2010.	1.66	5.10	0	0	25	35
Direct Company Investment 2006 – 2010	The percentage of the institutions' direct entrepreneurial investee company private equity investments expected for 2006 – 2010.	18.09	36.23	0	0	100	35
Direct Fund Investment 2006 – 2010	The percentage of the institutions' direct private equity fund investments expected for 2006 – 2010.	32.34	38.29	10	0	100	35
Fund of Fund Investment 2006 - 2010	The percentage of the institutions' direct private equity fund-of-fund investments expected for 2006 – 2010.	46.71	41.80	40	0	100	35
Excess Expected Basis Points for Private Equity	The number of basis points expected from private equity investments in excess of publicly listed equities over the period 2006 – 2010.	252.57	202.26	250	0	1000	35
Rank Dearth of Legal Restrictions	The institutional investor's rank (1=low and 5=high) of the importance of the comparatively fewer legal restrictions in private equity for the decision to invest	2.77	0.81	3	1	4	35
FTK 2006	The institutional investor's rank (1=low and 5=high) of the importance of the new "Financieel Toetingkader" (FTK) in 2006 by the Pensioen & Verzekeringskamer for the decision to invest	3.40	1.22	4	1	5	35
IFRS 2005	The institutional investor's rank (1=low and 5=high) of the importance of the new International Financial Reporting Standards (IFRS) (2005) for the decision to invest	2.71	1.07	3	1	5	35
BASELL II 2004	The institutional investor's rank (1=low and 5=high) of the importance of the new Basel II (2004) for the decision to invest	2.20	1.18	2	1	5	35

Table 2. Summary Statistics

This table summarizes the data by the characteristics of the institutional investors in terms of assets and expected rates of return in private equity (Panel A), their current and future asset allocations (Panel B), and their current and expected future private equity investments (Panel C).

Panel A. Characteristics of the Institutional Investors in the Dataset

Type of Financial Institution	Number of Institutions in the dataset	Average Assets (millions of Euros)	Average Targeted Absolute Rate of Return for Private Equity Investments (%) (as at 2005) for institutions that will invest in private equity '06-10	Average Targeted Relative Rate of Return for Private Equity Investments Relative to Public Equity (basis points) (as at 2005) for institutions that will invest in private equity 2006-2010
Pension Fund	56	€ 2,942.86	10.35	286.11
Insurance Company	25	€ 5,008.00	8.14	287.50
Bank / Financial Services	19	€ 9,752.63	13.17	440.00
All Types of Institutional Investors	100	€ 4,753.00	10.40	314.81

Panel B. Asset Allocations (Percentage of Assets Invested in Different Asset Classes)

	...Current (as at 2005)						
Type of Financial Institution	Publicly Traded Equities	Bonds	Cash / Currencies	Index Funds	Private Equity	Other Types of Alternative Investments	Other
Pension Fund	33.38	50.89	4.32	1.60	1.17	7.43	1.21
Insurance Company	23.80	55.72	9.56	0.48	0.73	6.23	3.48
Bank / Financial Services	27.32	48.43	5.11	0.58	1.36	16.05	1.16
All Types of Institutional Investors	29.83	51.63	5.78	1.13	1.09	8.77	1.77
	…Planned (for the period 2006-2010)						
Type of Financial Institution	Publicly Traded Equities	Bonds	Cash / Currencies	Index Funds	Private Equity	Other Types of Alternative Investments	Other
Pension Fund	31.51	51.73	2.86	1.97	1.67	9.53	0.73
Insurance Company	24.71	59.02	2.52	2.16	0.62	8.37	2.60
Bank / Financial Services	24.95	47.59	2.68	1.05	1.86	21.34	0.53
All Types of Institutional Investors	28.56	52.77	2.74	1.85	1.44	11.48	1.16

Table 2 (Continued)

Panel C. Private Equity Investments

	...Current (as at 2005)								
Type of Financial Institution	Number of Institutions Investing in Private Equity (All Regions)	Percentage of Private Equity Investments in The Netherlands	Percentage of Private Equity Investments in Europe outside The Netherlands	Percentage of Private Equity Investments in the U.S.	Percentage of Private Equity Investments in Asia	Percentage of Private Equity Investments in Rest of World	Percentage of Direct Company Investments	Percentage of Direct Fund Investments	Percentage of Fund of Fund Investments
Pension Fund	14	23.00	43.43	25.71	4.86	3.00	8.57	41.86	49.57
Insurance Company	7	26.71	49.43	23.86	0.00	0.00	23.57	52.86	23.57
Bank / Financial Services	8	13.38	44.75	28.13	0.63	0.63	36.88	19.00	31.63
All Types of Institutional Investors	29	21.24	45.24	25.93	2.52	1.62	20.00	38.21	38.34
	…Planned (for the period 2006-2010)								
Type of Financial Institution	Number of Institutions Investing in Private Equity (All Regions)	Percentage of Private Equity Investments in The Netherlands	Percentage of Private Equity Investments in Europe outside The Netherlands	Percentage of Private Equity Investments in the U.S.	Percentage of Private Equity Investments in Asia	Percentage of Private Equity Investments in Rest of World	Percentage of Direct Company Investments	Percentage of Direct Fund Investments	Percentage of Fund of Fund Investments
Pension Fund	19	13.00	52.42	28.58	3.21	2.79	6.32	36.58	57.11
Insurance Company	8	35.00	40.00	23.75	1.25	0.00	32.25	31.50	36.25
Bank / Financial Services	8	10.63	40.63	35.00	0.63	0.63	31.88	23.13	32.50
All Types of Institutional Investors	35	17.49	46.89	28.94	2.17	1.66	18.09	32.34	46.71

Table 3. Descriptive Statistics for Rankings for Factors Associated with Investing in Private Equity

This table summarizes the data by the characteristics of the institutional investors in terms of rankings of factors leading to investment in private equity (Panel A), objectives for private equity investment (Panel B), and legal factors affecting investment in private equity (Panel C). The rankings are reported for those institutions that invest currently or are expecting to invest in private equity. Rankings are based on the scale where 1=low and 5=high.

Panel A. Average Rankings of Importance of Factors Leading to Investment in Private Equity

Type of Financial Institution	Number of Institutions Investing in Private Equity 2006-2010	Macro-Economic Factors	Risk Diversification	Stock Market Developments	Return Expectations for Fixed Interest Rate Investments	Interest Rate Long Term Developments	Own Structure of Liabilities	Legal Environment (Premium Reserve Stock)	Fewer Regulations in Private Equity
Pension Fund	19	3.21	4.00	3.16	3.00	2.95	3.42	2.42	2.79
Insurance Company	8	3.25	4.00	2.88	3.38	2.88	3.88	2.63	2.75
Bank / Financial Services	8	3.14	3.57	3.29	3.57	3.29	3.43	2.29	2.75
All Types of Institutional Investors	35	3.21	3.91	3.12	3.21	3.00	3.53	2.44	2.77

Panel B. Average Rankings of Importance of Objectives for Institution to Achieve via Private Equity Activities

Type of Financial Institution	Reaching a Yearly Positive Return Over the Entire Period of the Commitment	Increase of the Relative Return	Portfolio Diversification	Risk Reduction	Balanced Portfolio (looking at correlation of private equity to other asset classes)	Corporate Objectives	Non-Financial Objectives	Other Objectives
Pension Fund	3.47	3.95	4.11	3.26	3.53	1.79	1.68	1.21
Insurance Company	3.13	3.63	4.25	3.63	4.13	3.38	2.88	2.25
Bank / Financial Services	4.00	4.13	4.13	3.13	2.88	2.00	1.88	1.00
All Types of Institutional Investors	3.51	3.91	4.14	3.31	3.51	2.20	2.00	1.40

Panel C. Average Rankings of Importance Changes in the Dutch Legal and Regulatory Environment for the Institution's Private Equity Investment Strategy

Type of Financial Institution	The New "Financieel Toetingkader" (FTK) in 2006 by the Pensioen & Verzekeringskamer	The New International Financial Reporting Standards (IFRS) in 2005	Implementation of Basel II in 2004	Reform of Dutch Bankruptcy Laws in the Period 1997-1999	Other Legal Issues
Pension Fund	3.42	2.37	1.74	1.63	1.00
Insurance Company	3.25	2.88	2.63	2.25	1.38
Bank / Financial Services	3.75	3.38	3.00	2.63	1.00
All Types of Institutional Investors	3.44	2.71	2.24	2.00	1.09

Table 4. Difference of Means and Medians Tests

This table presents difference of means and medians tests for the rank of the importance of the dearth of legal restrictions for the decision to invest in private equity. As indicated in Tables 1 and 2, this rank is based on a 1-5 scale. *, **, *** Statistically significant at the 10%, 5% and 1% levels, respectively. The Medians Test is the two-sample equivalent of the one-sample Sign-Test and this test is just as crude and insensitive; however, because there are so few assumptions, a statistically significant result is very convincing; see http://www.fon.hum.uva.nl/Service/Statistics/Median_Test.html for details on the calculations. The medians test result in this table indicates that the median rank of the importance of the dearth of legal restrictions for the decision of whether or not to invest in private equity is higher for those institutions not planning on investing in private equity.

	Planning on Investing in Private Equity in 2006 - 2010			Not Planning on Investing in Private Equity in 2006 - 2010			Difference of Means Test	Difference of Medians Test
	Number of Observations	Mean	Median	Number of Observations	Mean	Median		
Assets (million Euros)	35	10114.29	2000	65	1866.15	500	3.70***	p <= 0.000***
Rank of Importance of Dearth of Legal Restrictions	35	2.77	3	65	3.02	3	-1.55	p <= 0.014**
FTK (2006)	35	3.40	4	65	2.17	2	5.77***	p <= 0.003***
IFRS (2005)	35	2.71	3	65	1.97	2	3.68***	p <= 0.546
Basel II (2004)	35	2.20	2	65	1.25	1	4.58***	p <= 0.008***
Expected Return on Private Equity in Excess of Public Equity (Basis Points)	35	252.57	250	65	48.62	50	5.91***	p <= 0.000***

Table 5. Correlation Matrix

This table presents correlation coefficients across selected variables as defined in Table 1. Correlations significant at the 5% level are highlighted in bold and underline font. Correlations are for the full sample of 100 Dutch institutions.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	Rank Dearth of Legal Restrictions	1.00																
(2)	FTK	-0.07	1.00															
(3)	Basel II	0.02	**0.44**	1.00														
(4)	IFRS	0.12	**0.47**	**0.44**	1.00													
(5)	Log (Assets)	0.09	**0.37**	**0.28**	**0.37**	1.00												
(6)	Pension Fund	-0.09	-0.03	**-0.25**	**-0.26**	**-0.33**	1.00											
(7)	Insurance Company	0.16	-0.05	0.11	0.11	0.09	**-0.65**	1.00										
(8)	Bank / Financial Institution	-0.06	0.09	**0.20**	**0.21**	**0.33**	**-0.55**	**-0.28**	1.00									
(9)	All Private Equity 2006 – 2010	**-0.23**	**0.44**	**0.38**	**0.30**	**0.29**	0.09	-0.17	0.07	1.00								
(10)	Dutch Private Equity 2006 – 2010	**-0.36**	**0.24**	0.11	0.08	0.14	-0.09	0.14	-0.04	**0.28**	1.00							
(11)	European Private Equity 2006 – 2010	-0.01	**0.56**	**0.49**	**0.34**	**0.38**	0.06	-0.07	0.01	**0.60**	-0.02	1.00						
(12)	US Private Equity 2006 – 2010	0.00	**0.36**	**0.41**	**0.35**	**0.46**	-0.02	-0.07	0.11	**0.49**	-0.08	**0.49**	1.00					
(13)	Asia Private Equity 2006 – 2010	-0.02	0.15	0.01	-0.09	0.14	0.10	-0.06	-0.07	**0.41**	-0.02	0.17	**0.28**	1.00				
(14)	Rest of World Private Equity 2006 – 2010	-0.03	0.09	0.03	-0.05	0.08	0.13	-0.11	-0.05	**0.22**	-0.04	**0.25**	0.15	0.06	1.00			
(15)	Direct Company Investment 2006 – 2010	**-0.30**	**0.21**	**0.45**	0.11	0.05	**-0.21**	0.10	0.15	**0.29**	**0.69**	0.07	0.10	-0.05	-0.03	1.00		
(16)	Direct Fund Investment 2006 – 2010	-0.12	0.03	0.17	0.12	**0.32**	0.05	-0.03	-0.03	**0.51**	0.07	**0.52**	**0.49**	0.19	**0.32**	-0.07	1.00	
(17)	Fund of Fund Investment 2006 – 2010	0.06	**0.70**	**0.29**	**0.36**	**0.41**	0.10	-0.08	-0.04	**0.43**	0.04	**0.70**	**0.54**	**0.29**	0.14	-0.08	0.06	1.00
(18)	Excess Expected Basis Points for Private Equity	-0.01	**0.46**	**0.36**	**0.30**	**0.43**	0.01	-0.12	0.13	**0.70**	0.14	**0.62**	**0.40**	**0.36**	0.10	**0.22**	**0.36**	**0.46**

Table 6. Logit, OLS and Heckman Regression Models

This table presents, in Models (1) – (8), logit regression estimates of the probability of investment in private equity by a Dutch institutional investor in the period 2006-2010. Models (9) - (12) present OLS regression estimates of the percentage of the amount invested in all types private equity investment relative to assets managed; Model (9) uses the subsample of 35 institutions that are invested in private equity while Models (10) – (11) use the full sample of 100 institutions. Model (12) uses a Heckman correction whereby the first step considers the probability of being invested in private equity and the second step considers the % actually invested in private equity. Models (13) – (15) analyze investments allocated by region with Heckman corrections. The 2-step Heckman method first estimates the probability that an institution plans on investing in private equity, while the second step considers the region in which the institution invests (as a percentage of total PE investments). Models (16)-(18) also analyze the investments by type of investment (direct company, direct fund, and fund of funds) with Heckman corrections where the decision to invest is the first step regression. The dependent variable in Models (9) – (11) and the second step of the Heckman corrected Models (12) - (18) is ln(Y/(1-Y)), where Y is the percentage value for the respective model. This transformation of the dependent variable enables unbiased estimates associated with percentages bounded below by zero or bounded above by 100%. The independent variables are as defined in Table 1. The coefficients on the independent variables are robust to potential problems associated with collinearity of included and excluded variables; some variables are excluded where their inclusion spuriously affected the statistical significance of the other variables. The total population of firms comprises 100 Dutch institutional investors described in Tables 1 and 2. White's (1980) HCCME estimator is used in all regressions. *, **, *** Statistically significant at the 10%, 5% and 1% levels, respectively.

Panel A. Logit Analyses of the Allocations to Private Equity (PE) in 2006-2010, based on Full Sample of 100 Dutch Institutions

	Model (1)		Model (2)		Model (3)		Model (4)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-8.114	-2.558**	-7.418	-2.728***	-9.386	-2.795***	-13.171	-2.921***
Log (Assets)	0.472	1.666*	0.622	2.194**	0.798	2.200**	0.829	2.210**
Pension Fund	0.732	0.638	0.252	0.246	1.529	1.083	1.745	1.148
Insurance Company	1.556	1.219	0.915	0.853	0.549	0.378	1.697	1.019
Degree of Importance of Dearth of Regulations in Private Equity	-1.438	-2.481**	-1.462	-2.530**	-1.833	-2.324**	-2.281	-2.673***
IFRS	1.870	2.846***					1.293	1.559
FTK			1.494	3.006***			0.790	1.144
Basel II					2.828	2.961***	2.162	2.278**
Excess Expected Return on Private Equity	0.030	3.723***	0.023	3.586***	0.029	3.376***	0.035	3.344***
Model Diagnostics								
Number of Observations	100		100		100		100	
Pseudo R^2	0.646		0.635		0.727		0.775	
Loglikehood Function	-22.941		-23.622		-17.662		-14.566	
Chi Square Statistic	83.607***		82.244***		94.165***		100.358***	

Table 6 (Continued)

Panel B. Logit Analyses of the Allocations to Private Equity (PE) in 2006-2010, based on Subsample of 81 Dutch Pension Funds and Insurance Companies

	Model (5)		Model (6)		Model (7)		Model (8)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-9.252	-2.171**	-7.952	-2.241**	-7.833	-1.995**	-10.229	-2.309**
Log (Assets)	0.813	2.083**	0.847	2.362**	0.756	1.817*	0.830	1.972**
Pension Fund	-1.067	-0.895	-0.589	-0.547	1.261	0.904	0.120	0.080
Degree of Importance of Dearth of Regulations in Private Equity	-1.929	-2.197**	-1.777	-2.057**	-2.979	-2.254**	-3.553	-2.428**
IFRS	2.437	2.331**					1.025	1.068
FTK			1.658	2.707***			1.087	1.275
Basel II					3.843	2.483**	3.065	2.013**
Excess Expected Return on Private Equity	0.036	3.018***	0.0255	3.215***	0.0380	2.665***	0.0426	2.862***
Model Diagnostics								
Number of Observations	81		81		81		81	
Pseudo R^2	0.702		0.693		0.745		0.799	
Loglikehood Function	-15.345		-15.810		-13.163		-10.379	
Chi Square Statistic	72.426***		71.496***		76.790***		82.358***	

Table 6 (Continued)

Panel C. OLS and Heckman Analyses of the Allocations to Private Equity (PE) in 2006-2010, based on Full Sample of 100 Dutch Institutions

	Model (9): OLS on subsample that will invest in private equity		Model (10): OLS on full sample		Model (11): OLS on full sample		Model (12): Heckman Corrected Model			
							Step (1): Logit (LHS=1 if will Invest in Private Equity)		Step (2): Heckman Corrected Estimates	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.084	2.291**	0.015	0.589	0.009	0.376	-0.922	-1.888*	0.040	1.054
Log (Assets)	-0.005	-1.497	5.802E-05	0.033	-3.697E-05	-0.021	0.119	2.129**	-0.001	-0.153
Pension Fund	0.008	0.721	0.006	0.871	0.007	1.116			0.017	1.442
Insurance Company	-0.014	-0.995	-0.0004	-0.056	-0.0005	-0.084			-0.012	-0.915
Degree of Importance of Dearth of Regulations in Private Equity	-0.016	-2.114**	-0.010	-1.785*	-0.009	-1.717*	-0.227	-1.835*	-0.019	-3.113***
IFRS	0.007	1.414	0.005	1.628	0.003	1.186			0.005	1.12
FTK					0.001	0.563				
Basel II					0.004	1.757*				
Excess Expected Return on Private Equity	0.0001	5.108***	0.0001	9.629***	0.0001	7.596***	0.005	3.359***	0.0001	3.916***
Heckman's λ									0.019	1.593
<u>Model Diagnostics</u>										
Number of Observations	35		100		100		100		35	
Adjusted R^2 [Pseudo for Step (1) of Model (12)]	0.345		0.529		0.535		0.544		0.398	
Loglikehood Function	77.1931		253.601		255.417		-29.514		85.461	
F-Statistic	3.89***		19.50***		15.26***				4.10***	
Chi-square							70.461***			
Akaike Information Statistic	-4.129		-4.932		-4.928				-4.426	

Table 6 (Continued)

Panel D. Heckman Analyses of the Regional Allocations to Private Equity (PE) in 2006-2010, based on Full Sample of 100 Dutch Institutions

			Model (13)		Model (14)		Model (15)	
	Step (1) of Models (13) – (15): Logit Analysis of Decision to Invest in PE		Step (2) Heckman Regression Based on Step (1) Selection: % of Dutch PE Investments		Step (2) Heckman Regression Based on Step (1) Selection: % of Europe Investments outside The Netherlands		Step (2) Heckman Regression Based on Step (1) Selection: % of US Investments outside The Netherlands	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-3.818	-1.892*	0.024	0.705	0.009	0.249	-0.052	-2.090**
Log (Assets)	0.495	2.129**	-0.003	-1.062	-0.005	-1.877*	0.004	2.153**
Pension Fund			0.009	1.061	-0.001	-0.125	0.004	0.669
Insurance Company			-0.003	-0.260	-0.013	-1.407	-0.017	-2.410**
Degree of Importance of Dearth of Regulations in Private Equity	-0.940	-1.838*						
IFRS			0.007	1.662*	0.002	0.653		
FTK			-0.0002	-0.052	-0.003	-0.933		
Basel II			-0.004	-1.258	0.008	2.818***	-0.002	-0.948
Excess Expected Return on Private Equity	0.022	3.873***						
Portfolio Diversification Objectives			-0.004	-1.313	0.007	2.491**	0.004	1.576
Corporate Objectives			0.006	1.931*	0.001	0.189	0.004	2.081**
Rank of Macroeconomic Considerations					0.005	1.856*	0.003	1.473
Heckman's λ			-0.003	-0.467	-0.014	-2.146**	0.005	1.232
Model Diagnostics								
Number of Observations	100		35		35		35	
Adjusted R^2 (Pseudo R^2 for Step 1)	0.544		0.105		0.295		0.045	
Loglikehood Function	-29.514		98.025		102.181		109.924	
F-Statistic (Chi Square for Step 1)	70.46***		1.44		2.42**		1.20	
Akaike Information Statistic			-5.030		-5.210		-5.767	

Table 6 (Continued)

Panel E. Heckman Analyses of the Type of Allocation to Private Equity (PE) in 2006-2010, based on Full Sample of 100 Dutch Institutions

			Model (16)		Model (17)		Model (18)	
	Step (1) of Models (16) – (18): Logit Analysis of Decision to Invest in PE		Step (2) Heckman Regression Based on Step (1) Selection: Direct Company Investments		Step (2) Heckman Regression Based on Step (1) Selection: Direct Fund Investments		Step (2) Heckman Regression Based on Step (1) Selection: Fund-of-Fund Investments	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-3.818	-1.892*	0.041	1.242	-0.006	-0.141	-0.024	-0.858
Log (Assets)	0.495	2.129**	-0.005	-1.391	0.002	0.697	-0.0002	-0.093
Pension Fund			-0.013	-1.307			0.016	2.437**
Insurance Company			-0.021	-1.700*	-0.030	-2.261**	0.012	1.496
Degree of Importance of Dearth of Regulations in Private Equity	-0.940	-1.838*						
IFRS			0.001	0.262			0.002	0.710
FTK					-0.008	-2.210**	0.006	2.359**
Basel II							0.0001	0.059
Excess Expected Return on Private Equity	0.022	3.873***						
Portfolio Diversification Objectives					0.003	0.585	0.001	0.617
Corporate Objectives			0.007	1.998**	0.012	2.745***	-0.006	-2.746***
Yearly Rate of Return Objectives							0.006	2.673***
Heckman's λ			-0.004	-0.498	-0.002	-0.217	-0.008	-1.506
<u>Model Diagnostics</u>								
Number of Observations	100		35		35		35	
Adjusted R^2 (Pseudo R^2 for Step 1)	0.544		0.095		0.110		0.478	
Loglikehood Function	-29.514		88.989		84.056		109.217	
F-Statistic (Chi Square for Step 1)	70.46***		1.59		1.70		4.11***	
Akaike Information Statistic			-4.685		-4.403		-5.612	