

Private Equity and Venture Capital Fund Performance: Evidence from a Large Sample of Israeli Limited Partners

Alon Brav

Fuqua School of Business, Duke University, ECGI and NBER
brav@duke.edu

Guy Lakan

School of Business Administration, The Hebrew University
guy.lakan@mail.huji.ac.il

Yishay Yafeh

School of Business Administration, The Hebrew University, CEPR and ECGI
yishay.yafeh@huji.ac.il

This version: November 2022

Abstract

We use a newly-assembled, extensive data set on all investments by Israeli pension providers in private equity and venture capital funds over the past 15 years. Our detailed data contain complete cash flows to and from each fund and each investor, allowing us to evaluate fund performance using PME (rather than IRR) measures, which have been hitherto unavailable for non-US-based limited partners. We obtain three main results: (i) Fund performance, based on Israeli limited partner returns, has been slightly lower than performance derived from US-based literature. One explanation for this finding is limited access by foreign limited partners to top performing US funds; (ii) Investments in local, Israeli funds, both private equity and venture capital, have outperformed investments in foreign funds, possibly because of better access to local funds; (iii) We compare our data and results to those based on Preqin, one of the most commonly used commercial data bases, and find that Preqin tends to omit small funds as well as funds with poor performance, both within and outside the US at roughly the same rate. Part of the performance gap between limited partners in our data and the existing US-based literature may be due to this bias. While Preqin may provide reliable estimates of industry-wide performance, it may not always reflect the actual returns of LPs whose investments include funds outside the Preqin universe.

Keywords: Institutional Investors, Limited Partners, Private Equity, Venture Capital.

JEL Codes: G20, G23, G24.

1. Introduction

Pension funds and institutional investors around the world have been allocating an increasing fraction of assets under management to private equity, venture capital, and other types of private funds.¹ Public pension funds tracked by Preqin, for example, have steadily increased their allocations to this "alternative" asset class over the past decade, with the median allocation rising from 18.1% in 2010 to 30.3% in 2020, and 79% of investors saying that they expect to deploy a larger proportion of their funds into private equity by 2025 (Lee (2020)).

While allocations to private equity have been steadily increasing, there is limited systematic evidence on the performance of non-US-based institutional investors, the limited partners (LPs) of funds making investments in this asset class. Performance by non-US LPs may differ from what has been documented for US LPs for various reasons, such as differences in access to top performing funds (Sensoy et al. (2014)), differences in fees (Begenau and Siriwardane (2021)) and differences in skill or ability to select successful private equity (PE) or venture capital (VC) fund general partners (GPs) (Cavagnaro et al. (2019)).²

In this paper we utilize a newly-assembled and highly detailed data set on all capital calls and distributions associated with investments in PE and VC funds by the largest eight institutional investors in Israel. Much like their peers elsewhere, institutional investors in Israel, including pension funds, life insurance plans and other forms of long-term savings known as provident funds, have also increased their allocation to illiquid assets from 12% in 2010 to 17% in 2020. Their investments in PE and VC funds have increased from a mere 1% of their assets under management (AUM) in 2010 to 5% in 2020. This increase coincided with a dramatic increase of 250% in AUM during this period, driven by the introduction of mandatory retirement savings. As a result, the investment of Israeli LPs in PE and VC funds has become economically large.

The eight LPs whose investment performance is at the core of this study are the largest institutional

¹See, for example, Lerner et al. (2008), Ivashina and Lerner (2018), and Binfare et al. (2019).

²Earlier work by Lerner et al. (2007) documents large heterogeneity in the performance of different classes of LPs and Da Rin and Phalippou (2017) show that LPs vary significantly in the practices they employ when investing in PE and related assets.

investors in Israel, managing 76% of all retirement savings. The cash flow information constitutes part of the information that the financial institutions managing retirement savings are mandated to report to the Capital Market, Insurance, and Savings Authority at the Ministry of Finance. The data set is therefore free of survivorship and other biases documented in the literature in the context of some commercial data sources on PE and VC fund performance. Furthermore, in contrast with the limited availability of data on cash flows associated with non-US-based LPs in commonly used commercial data providers, our detailed cash flow data enable the calculation of performance measures such as the Public Market Equivalent (PME) relative to several traded benchmarks, whereas the existing literature has relied primarily on IRR-based measures for non-US LPs and GPs.

The performance of Israeli pension funds as LPs in PE and VC investments is interesting primarily because it is likely to be indicative of the performance of non-US based institutional investors elsewhere. The pension system in Israel is comprehensive, where every employee and employer must deposit a fixed fraction of the employee's income each month. These long-term savings are managed by for-profit, non-bank institutions, primarily insurance companies and other non-bank investment managers. In many ways, this pension system resembles the retirement savings plans of many developed (OECD) countries.³ In addition to its structure, the Israeli pension system is interesting because of its rapid growth. The main consequence of the introduction of a mandatory retirement saving system in Israel has been an increase in AUM of close to 10% p.a. over the past decade, reaching a total AUM of about 2.3 trillion ILS (about 700 billion USD) as of the end of 2019. Therefore, even in absolute terms, the allocation of funds by Israeli LPs to the PE and VC industry is now substantial.

Although not the main focus of the present study, the performance of Israeli LPs in their VC investments (as distinct from PE) may be of interest for another reason. According to the [OECD \(2016\)](#), VC investments relative to GDP in Israel is the highest in the world and Israel's reputation as the "start-up nation" makes the documentation of returns to investment in the Israeli VC industry particularly interesting. While there is an extensive literature on the growth of the high-tech sector

³Banks are not allowed to operate in the long-term savings market following a 2006 reform.

in Israel, there is no systematic evidence that we are aware of on the financial returns realized by local LPs. The data used in this study suggest that the average return has not been very high in comparison with relevant traded equity benchmarks.

The evidence present below is related to the on-going controversy in the literature regarding PE and VC performance. [Kaplan and Schoar \(2005\)](#) examine the performance of funds obtained from Venture Economics over the time period 1980-2001. They document an average net-of-fee fund rate of return that is approximately equal to that of the S&P 500. [Phalippou and Gottschalg \(2009\)](#) document an average net-of-fee fund performance of 3% per year below that of the S&P 500. [Phalippou \(2014\)](#) argues that, even though the average buyout fund outperforms the S&P 500, buyout funds mainly invest in small and value companies; he argues that the average buyout fund return is similar to that of small-cap indices. [Phalippou \(2020\)](#) finds that PE funds' return has been roughly equal to the return of public equity indices since 2006.

In contrast to studies which find no evidence for outperformance, there are several studies that reach the opposite conclusion: [Harris et al. \(2014\)](#), use data from Burgiss and find that PE and VC funds outperformed the S&P 500 by an average of more than 3% annually during the period 1992-2008. [Brown and Kaplan \(2019\)](#), use data for the years 1986-2014 and also find that PE funds outperformed the S&P 500. The literature has also produced more nuanced evidence, according to which PE and VC funds do not generally outperform the public markets but some parts of this asset class do, at least in certain periods. For example, a recent survey paper by [Korteweg et al. \(2022\)](#) finds, using long time-series data from 1969 to 2019, that PE funds outperformed the S&P 500 by a small margin, whereas VC and other types of funds have under-performed.

The analyses that we describe below are based on cash flows and net asset values (NAVs) for about 1,400 investments in PE and VC funds of various types including buyout, venture capital, real estate, debt, infrastructure and co-investments, for a 15-year period ending in December 2019. Using this information, our goal is to provide comprehensive evidence on the net-of-fee return realized by Israeli LPs. We compute PME measures of performance relative to six equity benchmarks and two debt benchmarks for private debt funds.

Our first finding is that PE performance in this sample is slightly lower than what has been documented for US LPs in the literature ([Harris et al. \(2014\)](#), [Korteweg et al. \(2022\)](#)). One possible interpretation for the lower performance is limited access: Israeli LPs may not be able to gain access to the top performing ("top quartile") funds. This may be due to size, because Israeli LPs are, on average, smaller than U.S. LPs: The average AUM of the eight largest pension funds in our data set, is about 60 billion USD, whereas the average US pension fund manages about 200 billion USD in assets ([Dyck and Pomorski \(2016\)](#)). Another possible reason for limited access may be that LPs based outside North America are perceived by fund managers as less prestigious than leading local (US-based) LPs. Yet another possible reason for limited access may be that Israeli LPs are geographically remote from the majority of private equity funds ([Da Rin and Phalippou \(2017\)](#)). Prior investment experience may affect access: established LPs may be better able to form connections with established fund managers ([Lerner et al. \(2007\)](#)). Israeli LPs are relatively new players in the PE market, although we do not find much evidence to support the conjecture that their access improves over time.⁴

After presenting estimates of average performance for the LPs in our sample, we compare the performance of investments in local (within-Israel) vs. foreign funds. [Hochberg and Rauh \(2013\)](#) argue that, in the context of US states, political interference and home bias in investments result in poor performance of local, within-state, performance of US public pension funds' PE investments relative to their out-of-state investments. By contrast, [Morkoetter and Schori \(2021\)](#), use international data and find that IRRs in foreign PE and VC funds, defined as funds located outside the LP's home region, are lower than the realized IRRs in local, within-region, funds. Our findings lend support to the latter view: We find that that local, within-Israel, PE and VC investments consistently outperform investments in foreign funds. This result holds across all types of funds. We attribute this finding to the LPs' superior access to top performing local PE and VC funds. Interestingly, we find that VC performance, including that of local VC funds, has generally been poor relative

⁴Conceptually distinct from limited access though empirically not always straightforward to measure, LP performance may also depend on skill in identifying and selecting top performing funds and GPs ([Cavagnaro et al. \(2019\)](#)). Recent work by [Goyal et al. \(2021\)](#) disputes the importance of access to high performing funds as an important factor explaining the investment choices of LPs. Instead, they argue high growth rates of capital allocated to private equity may be more likely to invest in first-time funds.

to the appropriate benchmarks (primarily NASDAQ). Although this result is consistent with the literature (e.g., [Korteweg et al. \(2022\)](#)), it is surprising given Israel's status as a "start-up nation," with the world's largest concentration of VC funds and VC investments per capita ([OECD \(2016\)](#)).

Finally, we also examine the possibility that the difference in returns realized by LPs in our data set and those reported by US-focused studies may be related to inadequate coverage in Preqin, one of the most commonly used data bases in the literature. Although it has been argued that data derived from Preqin is generally not severely biased ([Kaplan and Lerner \(2017\)](#), [Harris et al. \(2014\)](#), [Brown et al. \(2015\)](#)), we find a large discrepancy in performance between the universe of funds that are held by LPs in our sample and the subset of these funds which are also included in Preqin. Funds that are missing in Preqin are not necessarily non-US based, but are typically small and exhibit poor performance relative to the funds which are included in Preqin. This suggests that, while Preqin may be useful in estimating the returns generated by the PE/VC industry as a whole, it may not reflect precisely the returns realized by LPs who choose to, or are forced to, invest in relatively small funds that do not tend to outperform.⁵

The rest of the paper is organized as follows. Section 2 provides a description of the institutional investors in our data set and the pension system in Israel. Section 3 presents the data and methodology. In section 4 we present measures of performance for the institutional investors' investments in PE and VC. This section also includes a comparison between the performance of the local, Israeli, funds and foreign, mainly U.S., funds. In section 5 we present a comparison between our data set and data from Preqin. Section 6 provides our conclusion.

2. Institutional Background

This study is based on an extensive and detailed data provided by institutional investors in Israel as part of their mandatory monthly reports to the Capital Market, Insurance, and Savings Authority

⁵Studies investigating PE and VC fund performance from the fund's (rather than the LP's) perspective often use Burgiss, which is arguably more precise than Preqin. Data provided by Burgiss, however, covers LP investments only partially, maintaining the anonymity of both the funds and the LPs. Preqin collects their data from various sources, including public filings and reports, general partners (GPs) and by requesting information from public institutional investors ([Brown et al. \(2015\)](#)).

at the Ministry of Finance. We access information on the eight largest institutions, managing 76% of all long-term (pension) savings in Israel. We utilize only the eight largest institutions since the smaller ones have been involved in mergers and splits, impairing the completeness of their reported cash flows.

The institutional investors in our data set manage three different saving instruments: pension funds, provident funds, and life insurance. These instruments differ in certain dimensions that are not directly relevant to the present study (e.g., fee structure, extent of competition, etc.). In terms of asset allocation, life insurance funds have the highest percentage of illiquid assets (our focus is on PE and VC funds), mainly because there are no transitions of savers across different funds and a very low level of competition.⁶ Provident funds are characterized by a low percentage of illiquid assets and allocation to PE and VC funds., primarily because of the high level of competition in this segment and the frequent transitions of savers across different funds. Finally, pension funds are the fastest growing saving instrument in Israel, largely due to a law enacted in 2008 which requires individuals to deposit funds into these savings instruments. The institutional investors in our data set manage pension funds, other long-term savings instruments, as well as their own accounts, which we refer to below as their "*nostro*" accounts.⁷

The Israeli long-term savings market has undergone significant changes over the last fifteen years, mainly due to a regulation that forced banks to sell their long-term savings products to other institutions, primarily to insurance companies and other non-bank investment managers, some of which had managed mutual funds prior to the reform. As a result of this reform, and a 2008 law mandating savings for retirement by all, these institutions experienced rapid growth in their assets under management.

⁶Whereas in most long-term savings instruments in Israel savers can change the investment track or the managing company, in life insurance products there are significant switching costs. See a detailed discussion in [Hamdani et al. \(2017\)](#).

⁷Life insurance is the largest saving instrument in the Israeli long-term savings market and is managed by five of the eight institutions in our data set. In total, there are ten institutions managing life insurance products in Israel. Provident funds include mainly two saving instruments, differentiated by their investment horizon (long-term and medium term). All institutions in our data set manage both types of provident funds. In total, there are about 30 asset managers offering this saving instrument in Israel. Pension funds mainly include two savings instruments: mandatory pension savings and optional pension funds; the two types of funds are managed by both commercial institutional investors (included in our data) and by non-profit organizations such as certain labor unions.

Table 1 presents the value of all AUM by institutions in our data set as well as their investments in PE and VC, both local and foreign. The values in parenthesis represent the percentage of assets managed by the institutions in our data set relative to the assets managed by all institutional investors in the long-term savings market in Israel, accounting for 76% of total AUM, 81% of total investments in PE funds, and about 87% of total investments in VC funds. We are aware of no reason to expect that the smaller institutions not included in our data are fundamentally different than those included.

The rapid growth in these institutional investors' AUM, as well as the low interest environment of the past decade, have led to an increase in their propensity to invest in alternative assets: real estate, private (non-traded) loans, as well as PE and VC funds. The NAV of investments in PE and VC funds has grown dramatically from 2 billion ILS (about 500 million USD) in 2005 to 70 billion ILS (about 21 billion USD) in 2019. As presented in tables A1 and A2 in the appendix, much of the growth is driven by the increase in foreign, non-Israeli, funds, where Israeli institutional investors have invested twice as much as in local funds. Interestingly, only 7% of their investment are in VC funds (93% in PE funds), and most of the VC investments (70%) are local.

3. Data

We access two main data sources. The first is the complete series of daily cash flows from the eight largest institutional investors in Israel generated from their investments in private equity, venture capital, real estate, infrastructure, debt, and hedge funds. We focus on the performance (realized returns) of investments in about 300 PE funds and 140 VC funds over the period 2005 - 2019.⁸ The investments are divided by savings products, that is, pension funds, provident funds and life insurance, as well as the institutions' own investment (their "nostro accounts"). In addition to the daily cash flows related to each savings product and to the nostro account, our data set contains the NAV for each PE, VC or other fund types.

The split between savers' retirement assets and the institutions' own accounts enables us to rule out

⁸Prior to 2005 the institutional investors in our data set had invested only in a very limited number of funds.

possible concerns about conflicts of interest in the context of PE/VC investments. For example, a possible concern might be that institutional investors would invest in well-performing funds through their nostro accounts, when facing limited access to the top quartile funds. In practice, we find that there is an overlap of close to 90% between the funds associated with nostro and savings accounts, yielding almost identical performance for PE and VC funds allocated to savers and those allocated to the institutions' own accounts.⁹

The second data set we use is from Preqin, one of the most commonly used data sets in the academic literature on private equity (see, [Harris et al. \(2010\)](#) and [Brown et al. \(2015\)](#)). We use data from Preqin to compare the PE and VC funds that are included in our first data set to funds listed in Preqin. The data provided by Preqin is gathered from multiple sources including voluntary data contributions.¹⁰ The voluntary aspect of these reports raises the concern that funds reporting their performance to Preqin are not a random sample or do not include the entire universe of funds. To examine these issues, we ask, for each PE and VC fund in which the LPs in our data set invest in, whether it is also listed in Preqin. For overlapping funds, we calculate performance using both the cash flows as they appear in our data set as well as the cash flows reported by Preqin and the fund's size and country of incorporation. In cases where the fund appears in Preqin, we draw this information from its listing details. In cases where the fund does not appear on Preqin, we obtain this information from the websites of the funds and from the LPs themselves.

4. Methodology and research design

We measure fund performance using the public market equivalent (PME) approach of [Kaplan and Schoar \(2005\)](#), as this performance metric is considered superior to other commonly used

⁹See Appendix Table A3 which uses PME measures of performance defined below. With the exception of one institution (institution F) there is no evidence for outperformance of the nostro accounts relative to the savings products. The exceptional case of Institution F is apparently due to one successful Israeli PE fund in which the institution invested in through its nostro account and not through the saving products.

¹⁰As stated on their website, "Since 2003, we have built valued relationships with fund managers, institutional investors and other industry professionals who are happy to provide us with data on their activities. We also obtain our data via various FOIA (Freedom of Information Act) requests, public filings and industry-recognized news sources. While FOIA remains an important source of data, Preqin also receives voluntary data contributions from more than 12,000 fund managers, and more than 10,000 funds."

methodologies such as the internal rate of return (IRR) and the cash multiples ([Gottschalg et al. \(2007\)](#), [Phalippou \(2008\)](#)). These latter methods involve serious problems including over-estimation of the variation of performance across funds and of the performance of the top quartile of funds. These measures are also amenable to easy manipulation, possibly distorting the fund manager’s incentives. ([Phalippou \(2008\)](#)) claims that IRR is probably the worst performance metric one may use in an investment context, whereas the use of PME yields more reliable conclusions.

We calculate the aggregate PMEs for each limited partner by pooling all daily cash flows generated from each of their PE and VC investments. In essence, this generates for each LP a single portfolio consisting of all the LPs PE and VC investments, where the weight is the fraction of the total amount invested in this asset class. We also compute aggregate PMEs for investments by fund type (PE, VC, Real estate, etc.) by aggregating the full daily cash flow for each funds type across all limited partners.

We use several equity and debt indices as benchmarks. For equity, we use tradeable ETFs tracking the following indices: (1) S&P 500: the ‘[SPDR](#)’ ETF; (2) Tel Aviv (TA) 125: the ‘[KESEM TA 125](#)’ ETF; (3) NASDAQ: the ‘[QQQ](#)’ ETF; (4) MSCI World: the ‘[iShares MSCI World](#)’ ETF; (5) MSCI ACWI: the ‘[iShares MSCI ACWI](#)’. For debt benchmarks we use tradeable ETFs tracking the following indices: (1) [ICE BofA US High Yield Index Option-Adjusted Spread](#) and (2) [iShares iBoxx \\$ High Yield Corporate Bond ETF](#). All our calculations end in December 2019, so that inferences are not affected by the onset of the COVID-19 pandemic. We compute PME values both for funds that were liquidated, where the NAV is effectively zero, and for funds which are still alive, using the NAVs reported in the financial statements at the end of 2019.¹¹ Finally, we follow [Gredil et al. \(2014\)](#) and compute fund performance using their direct alpha metric, representing the annual excess return of the PE and VC funds relative to their benchmarks.

In order to compare the performance of the Israeli PE, VC, and other funds to that of foreign funds we estimate the performance of each fund, controlling for the fund’s geographic location using a dummy variable which takes the value 1 when the GP is located in Israel and 0 otherwise; the

¹¹We also perform a robustness test in which we exclude the funds with NAV>0; the results remain qualitatively unchanged.

fund's type (PE, VC, debt, real estate, infrastructure); and the fund's vintage year. We perform this analysis at the LP-investment level, where each observation is the performance of an investment in a fund by a specific LP. We cluster the standard errors by fund and by limited partner.

5. Results

5.1. *Unconditional performance*

Table 2 provides our main performance measures, PME and direct alpha, calculated relative to six different indices. The PMEs are below 1.0 and the direct alpha values are negative relative to the S&P 500. The average PME relative to non-US benchmarks is close to 1.1 and the average direct alpha is about 3.4% relative to the local benchmark (TA 125). Furthermore, when we examine the performance relative to other benchmarks, we find that PMEs relative to the Russell 2000 are between 0.93 to 1.2, with an average value above 1. Relative to NASDAQ, the PMEs are much lower, below 1 for almost all LPs. When measured against the MSCI global indices, the PMEs are, on average relatively high, slightly above 1.1. Overall, investments in the broad PE and VC asset classes have not outperformed the S&P 500 and the NASDAQ indices. Furthermore, the evidence provided here suggests that Israeli, and possibly other foreign (non-US-based) LPs, earn, on average, returns that are somewhat lower than those reported in the extant literature for US-based LPs.¹²

The underperformance we document may be due to limited access of foreign institutions to top performing, US-based, funds that are allegedly in the "upper quartile," of performance or possibly to their limited skills in identifying promising funds. Alternatively, some of the differences may be "technical" rather than "economic," due to possible limitations in the coverage of Preqin, one of commonly used data sources from which data on the PMEs of US-based LPs are often derived. We explore these issues in more detail below.

¹²The comparison, however, is not perfect since different studies use different samples and different time periods. See also Josh Lerner's testimony at the SEC ([Link](#)), suggesting a PME value of slightly above one for US buyout funds in recent years relative to the Russell 3000 index.

5.2. Performance of different types of funds

Table 3 presents average value-weighted PME, calculated by aggregating the cash flows for each fund type and geographical location across LPs. The results indicate that investments in local (Israeli) funds are associated with higher PMEs in comparison with investments in foreign, non-Israeli, funds. This result is consistent across all fund types, both equity and debt, with the exception of hedge funds. For PE funds, while the average PME of Israeli funds relative to the S&P 500 index, is 0.98, the PME of foreign PE funds is about 0.96. For VC funds, we, again, find that investments in Israeli funds are associated with a rather low PME of 0.86 relative to the S&P 500, which is still slightly higher than the PME associated with foreign VC funds, 0.84 on average.

Israeli real estate funds are similarly associated with a PME of 0.93 relative to the S&P 500 index vs. 0.8 for foreign funds. Local infrastructure funds earn an average PME of 0.98 relative to the S&P 500, while the PME for the foreign infrastructure funds is 0.91. This pattern remains unchanged when analyzing the performance of debt funds: The PME of local debt funds relative to *Ishares* High Yield ETF is 1.11, while the PME of foreign debt funds is 0.97. Hedge funds are the only exception, where we find that foreign hedge funds outperform local hedge funds. The general pattern in which local funds outperform foreign funds (except for hedge funds) remains unchanged when we use alternative benchmarks.

As an alternative to the value-weighted average PMEs, we also calculate PMEs based on equal weights, that is, where each fund is assigned a weight of one over the number of funds in the portfolio, regardless of the amount invested. The equal-weights average PME relative to the S&P 500 is 1.12 for the Israeli PE funds and 0.99 for foreign PE funds (the comparable value-weighted figures are 0.98 and 0.96, respectively, see Table 3). The equal-weighted average PME for Israeli VC funds relative to the S&P 500 is 0.96, while the PME for foreign VC funds is 0.85 (the comparable value-weighted figures are 0.86 and 0.84, respectively). The differences between Israeli and foreign PE/VC funds continue to hold and are statistically significant with a p-value $< 5\%$.

The fact that the PMEs calculated using equal weights are higher than the value-weighted average PMEs implies that the LPs in the sample invest larger amounts in funds whose performance is rel-

atively low, perhaps due to "limited" access which allows the LPs to participate in high-performing funds but limits the amounts they can invest. Stated differently, there may be decreasing returns to scale in these investments. Interestingly, the difference between the equally-weighted and value-weighted PME appears to be larger for Israeli PE/VC funds than for foreign funds. One interpretation of this finding is that while the LPs in the sample face a constraint on the amounts they can invest in Israeli funds due to the small size of the market, investments in foreign funds tend to be concentrated in medium-performing funds. This may explain both the lower average performance of foreign funds relative to local (Israeli) funds, as well as the smaller gap between PMEs calculated using equal weights and value weights in foreign funds.

Table 4 presents regression results comparing the PME of local and foreign funds, controlling for vintage year, LP and fund-type fixed effects. The coefficient of interest, the dummy variable denoting local funds, is positive and highly significant for all benchmarks and across the different specifications, indicating that local investments in PE and other funds outperform investments in foreign funds. The magnitude of the difference in PMEs between local and foreign funds is in the range of 7 - 16 basis points, depending on the benchmark and specification (this is an economically large difference, given that the average PME is typically close to, or a bit below, one). In addition, we find that buyout funds, the omitted category, outperform almost all other fund types.

We conclude that, unlike [Hochberg and Raub \(2013\)](#), in our data set, local investments, on average, yield higher abnormal performance than foreign investments. The amounts invested within Israel are relatively small in comparison with the amounts invested in foreign funds but in the home market, the LPs in our sample appear to be able to access the best performing funds. When investing large amounts in funds overseas, the realized performance is lower. One interpretation of this evidence is that Israeli LPs, and perhaps other non-US-based LPs as well, have limited access to the top performing foreign (notably US-based) funds. Alternatively, they may have poor skills in selecting foreign PE and VC funds. In both respects, they are able to do better when investing in local funds. There may, of course, be other reasons why local investments may outperform foreign ones, such as contractual agreements (fees) that are less favorable to non-US LPs. Beside their possible implications for the design of the optimal allocation of capital to local and foreign

funds, these findings point to the possible role of intermediaries in the PE and VC markets. These intermediaries, such as funds of funds, or separately managed accounts (SMAs), may be able to provide non-US based LPs with some access to top performing US funds, although it is unclear how the surplus, or rents, that might be generated by these intermediation services are distributed between the LP and the intermediary.

6. A Comparison with Preqin

Our data is based upon highly detailed mandatory reports provided by the LPs themselves to the supervisory authority at the Ministry of Finance. It is therefore likely to be accurate, comprehensive in coverage and free of biases which have been discussed in the literature in the context of commercial data sets such as Preqin. In this section we compare our data to Preqin, one of the most extensively used data sources in the literature, in order to better understand the determinants of non-US-based-LPs' investment performance as well as to shed light on possible limitations associated with the use of statistics derived from Preqin.

We begin by documenting the extent of overlap between investments in PE and VC, as reported by the LPs in our data set, with the fund-level data as reported by Preqin. We therefore identify funds included in the portfolios of the Israeli LPs in our sample as they appear on Preqin. For overlapping funds, we compare performance measures (PME and IRR) based on our data set with that derived from the available cash flow data in Preqin. There are a large number of funds that appear in Preqin but no further information on cash flows is provided. In such cases it is not possible to calculate fund performance based on Preqin. We therefore use funds appearing in our data set which are included in Preqin without their cash flows, as well as funds which do not appear on Preqin at all in order to evaluate the completeness of Preqin's data.

Table 5 provides a comparison between the performance of private equity and venture capital funds (local and foreign) in our data set and those included in Preqin. We compute PMEs relative to the 'SPDR' ETF, tracking the S&P 500. Panel A provides the average PME for funds which are included in both our data set and in Preqin under the exact same LP and have cash flows reported

in Preqin. Panel B provides performance for funds in our data set and in Preqin under the exact same LP for which there are no cash flows reported in Preqin. Panel C provides performance for funds included in our data set but not in Preqin. The columns contain the PME's derived from each data set and the number of funds.

Panel A shows that the PME's of foreign (non-Israeli) PE funds yield identical results when using cash flows as reported in our data set or in Preqin (82 overlapping funds); other types of funds include only a few overlapping funds, so it is hard to draw unequivocal conclusions from this analysis. The fact that we observe the same average PME across many overlapping PE funds, suggests that there are no major differences in the fees that Israeli institutional investors (LPs) pay in comparison with the LPs on which Preqin data are based.

Panel B provides estimates of performance for funds included in our data set and in Preqin under the exact same LPs for which there are no cash flows reported in Preqin. We find that the average PME's derived from the cash flows in our data set are mostly lower (with the exception of Israeli PE funds) relative to the funds in panel A, which have their cash flows reported on Preqin. The average PME drops from 1.03 in panel A to 0.94 in Panel B. One interpretation of this result may be that funds with poor performance do not share their cash flow data with Preqin.

Panel C of Table 5 presents the third comparison, focusing on funds included in our data set but not in Preqin. There is a significant number of such funds (219), in comparison with 274 overlapping funds. The PE funds in this category, both Israeli and foreign, exhibit lower PME's than the funds in panel A. Foreign (non-Israeli) VC funds, which are located mainly in the US, exhibit higher PME's than the foreign VC funds in Preqin, perhaps because of the absence of confidentiality-oriented top tier VC funds in Preqin (Kaplan and Lerner (2017)).

Table 6 presents the IRRs of the different funds, reported as in table 5. Again, performance is similar in our data set and in Preqin when both sources include cash flows (Panel A). Note that the extreme IRR values of the Israeli PE and VC funds among the overlapping funds in Panel A which have cash flow data in Preqin is driven by the fact that Preqin has data on a very limited number of funds (only five Israeli funds in each category). The average performance is therefore largely

affected by extreme values. For example, the Israeli PE funds have an average IRR of -6.79%, a result which is driven by one well-known Israeli fund with an IRR of -90%.

Panel B includes the funds that are listed in both data sets under the same LP but do not have their cash flow data reported in Preqin. Both foreign PE and foreign VC funds in this group have a lower average IRR than the funds that have cash flow data on Preqin (panel A). With respect to Israeli funds, PE funds in panel B have an average IRR value of 10.4%, in comparison with the very few Israeli PE funds in panel A which have an average IRR value of -6.79%. The opposite is observed for Israeli VC funds, with the funds in panel B having an average IRR value of 2.27%, while the average IRR for the small number of overlapping funds with cash flow data in Preqin is 26.1%.

We observe a similar pattern in panel C of Table 6, for funds that are not listed in Preqin at all. The aggregate average IRR is 3.85% in comparison to the average of 11.54% in panel A. The average IRR of the foreign PE funds is 2.57%, much lower than the average IRR of the foreign PE funds in panel A. However, foreign VC funds in Panel C have a higher average IRR than the funds in panels A and B. The Israeli PE funds have an average IRR of 4.93%, in comparison to IRR of 10.4% in panel B. We observe the opposite trend when analyzing the average IRR of the Israeli VC which is higher than the average IRR in panel B, and equals to 4.06%.

The comparisons presented so far suggest that, while Preqin may provide a reliable indication of the overall performance of the PE or VC industries, it does not necessarily provide an accurate reflection of the returns realized by the LPs in our sample and possibly other institutional investors not based in the US. We now turn to examine more formally if there are any fund characteristics which are relevant to the probability of being included in (or excluded from) Preqin. Table 7 presents the comparison between a fund's country of incorporation and the average AUM of the overlapping funds and the funds that are not listed in Preqin. The table includes four panels: Panels A and B present funds by country of incorporation. These include the U.S, Israel, the UK, and other countries (Europe and East Asia) for overlapping funds and funds that are not listed in Preqin. Panels C and D compare the average fund size (in millions of dollars) of the two fund groups.

The results in Panels A and B of Table 7 indicate that Preqin tends to miss not only funds located outside the US: the proportion of omitted funds located in the US is similar to the general rate of omission. In addition, PE funds are more likely to be omitted than VC funds, with US VC much less likely to be omitted than Israeli VC funds.

Panel C and D present the average fund size in the different groups of funds. The average PE fund size is much smaller among the funds that are not listed in Preqin in comparison with overlapping funds. In US funds, the average omitted fund is half the size of the average overlapping fund. Omitted US VC funds are also smaller than the overlapping US VC funds. This is not the case for Israeli VC funds, although the small number of overlapping VC funds, Israeli and foreign, makes it difficult to draw firm conclusions, or comparisons, between PE and VC funds in this respect.

Table 8 presents Probit regressions, estimating the effects of fund characteristics on the probability of being included in Preqin. We measure the effect of fund performance using PME relative to the S&P 500, and IRRs. Fund characteristics include fund size, measured in millions of US dollars; vintage year, where funds established prior to 2008 are the omitted category; and the fund's country of incorporation, where funds which located in the US are the omitted category. We employ three samples: (i) funds located in the US; (ii) funds located outside the US; and (iii) the full sample.

The results suggest that better performance increases the probability of being included in Preqin. The coefficients on performance are highly significant in all specifications, for both funds located in the US and elsewhere. Larger funds are also more likely to appear in Preqin; this effect is more pronounced for non-US funds in comparison to funds which are based in the US. Funds established before 2008 (the omitted vintage group) have a higher probability of being listed in Preqin than later funds. This puzzling result may be due to the large increase in the AUM of the Israeli LPs and their rapidly growing investments in this asset class. Growth may have forced them to invest in first-time funds, whose probability of being listed in Preqin is presumably low. This interpretation is in line with Goyal et al. (2021), who find that LPs whose capital allocation to PE is fast growing are more likely to invest in first-time funds.

Finally, we analyze the association of fund characteristics with the probability of having cash

flow data reported on Preqin. We restrict attention to funds which appear in that data base. The specification is similar to that used in table 8 except that the dependent variable takes the value 1 if the fund has cash flows reported on Preqin, and 0 otherwise. The results indicate that performance and size play an important rule in determining whether a fund’s cash flow data appear on Preqin: Better performance and larger size increase the probability for having cash flow data on Preqin. In addition, we find that funds which are located in the US are more sensitive to performance, while for funds which are located outside the US, size has a larger effect on the probability of having cash flows reported in Preqin.

We conclude that the Preqin data set is far from complete in its coverage. In addition to the substantial number of funds that do not appear in Preqin at all, the omitted PE funds’ performance appears to be systematically poorer relative to that of included funds. In addition, we find that the missing PE funds are mostly smaller than the overlapping funds. Although Preqin may represent the aggregate performance of PE of funds quite well, its under-representation of small and not-top-quartile funds may be important for evaluating the choice set of foreign LPs.

7. Conclusion

In this study we use a newly-assembled data set on all investments by Israeli pension providers in PE and VC funds over the past 15 years. Our detailed data contain complete cash flows to and from each fund and each investor, allowing us to evaluate fund performance using PME (rather than IRR or cash multiples) measures, which have been hitherto unavailable for non-US-based limited partners. Our study contributes to the literature that seeks to shed light on investments by non-US LPs in PE and VC funds, especially in the context of performance comparisons between local and foreign funds. In addition, we try to shed a light on some of the limitations of Preqin in this context.

Our main findings are as follows. First, fund performance, based on Israeli LP returns in this data set, is slightly lower than the estimates in the US-based literature. These differences in performance may be caused by economic reasons, such as limited access by foreign LPs to top

performing US funds, or lack of skill by the Israeli LPs. In addition, despite Israel's image as the "start-up nation", the performance of VC funds, both Israeli and foreign, has generally been poor relative to the appropriate benchmarks (NASDAQ, primarily). This result raises the question who are the funds that invest in the top quartile Israeli high-tech companies. A plausible answer may be that top US VC funds take part in funding these companies. Second, we find that, in contrast to [Hochberg and Rauh \(2013\)](#), investments in local, Israeli funds, both PE and VC, have outperformed investments in foreign, non-Israeli funds, possibly because of better access to local funds. We propose several interpretations for this result: non-US limited partners may have limited access to the top performing foreign funds (notably US-based); alternatively, they may have poor skills in selecting foreign PE and VC funds. In this context, the analysis suggests the presence of two opposing effects: On the one hand, as their assets under management increase LPs may become more established and improve their access to top performing funds. On the other hand, as assets under management grow, an LP may be forced to invest in "mediocre" funds. The Israeli LPs in our sample have grown dramatically over the last fifteen years and their investments in foreign funds have also grown at a high rate, much like other institutional investors in many countries outside the US. The fact that this growth was not associated with improved investment performance suggests that the latter effects, the decreasing returns, has been more important than the possibly improved access.

Finally, we compare our data and performance measures to those derived from Preqin, one of the most commonly used commercial data bases, finding that Preqin tends to omit small PE funds, as well as funds with poor performance, both within and outside the US, at roughly the same rate. This suggests that caution be used in relying on the Preqin to measure the investment performance of non-US-based LPs.

References

- Begenau, J. and Siriwardane, E. (2021), ‘How do private equity fees vary across public pensions?’, *Working paper, Harvard Business School* .
- Binfare, M., Brown, G., Harris, R. and Lundblad, C. (2019), ‘How do financial expertise and networks affect investing? evidence from the governance of university endowments’, *Working paper, University of North Carolina (UNC) at Chapel Hill* .
- Brown, G. W., Harris, R. S., Jenkinson, T., Kaplan, S. N. and Robinson, D. T. (2015), ‘What do different commercial data sets tell us about private equity performance?’, *Working paper, University of North Carolina (UNC) at Chapel Hill* .
- Brown, G. W. and Kaplan, S. N. (2019), ‘Have private equity returns really declined?’, *The Journal of Private Equity* **22**(4), 11–18.
- Cavagnaro, D. R., Sensoy, B. A., Wang, Y. and Weisbach, M. S. (2019), ‘Measuring institutional investors’ skill at making private equity investments’, *The Journal of Finance* **74**(6), 3089–3134.
- Da Rin, M. and Phalippou, L. (2017), ‘The importance of size in private equity: Evidence from a survey of limited partners’, *Journal of Financial Intermediation* **31**, 64–76.
- Dyck, A. and Pomorski, L. (2016), ‘Investor scale and performance in private equity investments’, *Review of Finance* **20**(3), 1081–1106.
- Gottschalg, O., Phalippou, L. et al. (2007), ‘The truth about private equity performance’, *Harvard Business Review* pp. 17–20.
- Goyal, A., Wahal, S. and Yavuz, M. D. (2021), ‘Picking partners: Manager selection in private equity’, *Swiss Finance Institute Research Paper* .
- Gredil, O., Griffiths, B. E. and Stucke, R. (2014), ‘Benchmarking private equity: The direct alpha method’, *University of North Carolina* .
- Hamdani, A., Kandel, E., Mugerman, Y. and Yafeh, Y. (2017), ‘Incentive fees and competition in pension funds: evidence from a regulatory experiment’, *Journal of Law, Finance and Accounting* **2**(1), 49–86.
- Harris, R., Jenkinson, T. and Stucke, R. (2010), ‘A white paper on private equity data and research’, *Working paper, UAI Foundation* .
- Harris, R. S., Jenkinson, T. and Kaplan, S. N. (2014), ‘Private equity performance: What do we know?’, *The Journal of Finance* **69**(5), 1851–1882.
- Hochberg, Y. V. and Rauh, J. D. (2013), ‘Local overweighting and underperformance: Evidence from limited partner private equity investments’, *The Review of Financial Studies* **26**(2), 403–451.
- Ivashina, V. and Lerner, J. (2018), ‘Looking for alternatives: Pension investments around the world, 2008 to 2017’, *Working paper, Harvard Business School* .

- Kaplan, S. and Lerner, J. (2017), Measuring entrepreneurial businesses: Current knowledge and challenges, *in* J. Haltiwanger, E. Hurst, J. Miranda and A. Schoar, eds, ‘Measuring Entrepreneurial Businesses: Current Knowledge and Challenges’, University of Chicago Press, chapter Venture Capital Data: Opportunities and Challenges, pp. 413–431.
- Kaplan, S. N. and Schoar, A. (2005), ‘Private equity performance: Returns, persistence, and capital flows’, *The Journal of Finance* **60**(4), 1791–1823.
- Korteweg, A., Westerfield, M. M. et al. (2022), ‘Asset allocation with private equity’, *Foundations and Trends in Finance* **13**(2), 95–204.
- Lee, M. (2020), ‘Future of alternatives 2025: Investors’ inexorable push to alternatives’.
- Lerner, J., Schoar, A. and Wang, J. (2008), ‘Secrets of the academy: The drivers of university endowment success’, *Journal of Economic Perspectives* **22**(3), 207–22.
- Lerner, J., Schoar, A. and Wongsunwai, W. (2007), ‘Smart institutions, foolish choices: The limited partner performance puzzle’, *The Journal of Finance* **62**(2), 731–764.
- Morkoetter, S. and Schori, T. (2021), ‘Home bias and local outperformance of limited partner investments: Evidence from private equity fund manager selection’, *Working paper, University of St. Gallen* .
- OECD (2016), *Venture capital investments*, in Entrepreneurship at a Glance 2016, OECD Publishing, Paris.
- Phalippou, L. (2008), ‘The hazards of using IRR to measure performance: The case of private equity’, *Working Paper, University of Oxford* .
- Phalippou, L. (2014), ‘Performance of buyout funds revisited?’, *Review of Finance* **18**(1), 189–218.
- Phalippou, L. (2020), ‘An inconvenient fact: Private equity returns and the billionaire factory’, *The Journal of Investing* **30**(1), 11–39.
- Phalippou, L. and Gottschalg, O. (2009), ‘The performance of private equity funds’, *The Review of Financial Studies* **22**(4), 1747–1776.
- Sensoy, B. A., Wang, Y. and Weisbach, M. S. (2014), ‘Limited partner performance and the maturing of the private equity industry’, *Journal of Financial Economics* **112**(3), 320–343.

Table 1: **Asset allocation in the long-term savings market in Israel**

This table provides descriptive statistics on total assets under management (AUM, in billions of ILS) and net asset values of private equity and venture capital funds held by institutional investors in our sample. Each column represents a different savings product. *Life Insurance*, the largest product, in terms of AUM, is offered by five of the institutions in the sample. *Provident funds* consist of two savings instruments differentiated by their investment horizon, long-term and medium term. All institutions in our data set manage both types of provident funds. *Pension funds* include two savings instruments: mandatory pension funds and voluntary funds. Both types are managed by commercial institutional investors (included in the sample), and by non-profit organizations. All institutions in our data set manage pension funds. *Nostro* allocations represent the institutions' own investments; we have data on Nostro investments for five institutions. We report allocations to PE and VC funds for each of the four investment categories. In this table, PE includes not only buyout funds but also real estate, infrastructure and debt funds. The percentage of total assets associated with the universe of Israeli long-term savings managers is given in parenthesis.

	Life Insurance	Nostro	Provident Funds	Pension	Total
AUM	375.8 (99%)	155.8 (87%)	321.1 (60%)	673.4 (75%)	1526.1 (76%)
Private Equity	19.3 (99%)	6.1 (91%)	12.6 (61%)	26.6 (81%)	64.6 (81%)
Israel	4.4 (97%)	1.9 (87%)	3.8 (55%)	4.6 (76%)	20.2 (75%)
Foreign	14.9 (100%)	4.1 (94%)	8.7 (64%)	22.0 (82%)	49.7 (83%)
Venture Capital	1.5 (99%)	0.3 (95%)	0.8 (60%)	2.0 (94%)	4.6 (87%)
Israel	1.0 (98%)	0.2 (99%)	0.6 (62%)	1.4 (92%)	3.2 (86%)
Foreign	0.5 (100%)	0.1 (100%)	0.2 (52%)	0.6 (98%)	1.4 (88%)
Hedge Funds	3.8 (99%)	0.4 (95%)	3.3 (49%)	1.3 (71%)	8.8 (69%)
Israel	0.7 (95%)	0.3 (99%)	1.1 (52%)	0.4 (64%)	2.5 (68%)
Foreign	3.1 (100%)	0.1 (100%)	2.2 (48%)	0.9 (75%)	6.3 (70%)

Table 2: **Performance of private equity and venture capital funds**

This table provides estimates of the relative performance of private equity, including buyout, real estate and infrastructure funds, but excluding debt funds, and performance of venture capital investments by each of the institutions in our sample. We label the eight institution A to H so as not to reveal their identity. In panel A we report public market equivalent measures, calculated by pooling all cash flows and net asset values for all the funds for each institutional investor for the entire sample period. For benchmarks we use tradeable ETFs tracking the following indices: (1) S&P 500: the '[SPDR](#)' ETF; (2) Russell 2000: the '[iShares Russell 2000](#)' ETF; (3) TA 125: the '[KESEM TA 125](#)' ETF; (4) NASDAQ: the '[QQQ](#)' ETF; (5) MSCI World: the '[iShares MSCI World](#)' ETF; (6) MSCI ACWI: the '[iShares MSCI ACWI](#)' ETF. Panel B provides estimates of Direct Alpha. Estimates in columns 2-7, reported in percent, are calculated by pooling the cash flow of all funds in each year and summing the NAVs at the end of the period (for funds that have not yet been liquidated). When computing public market equivalent and direct alpha for funds that report in a foreign currency, we first convert the cash flows, NAVs, and the benchmark return to local currency.

<i>Panel A: Public market equivalent</i>							
Institution	S&P 500	Russell 2000	TA 125	NASDAQ	MSCI World	MSCI ACWI	Num.of Funds
A	1.00	1.09	1.10	0.92	1.11	1.12	87
B	0.93	0.98	1.10	0.83	1.09	1.10	245
C	0.91	0.98	1.07	0.79	1.08	1.09	260
D	0.89	0.93	1.01	0.78	1.03	1.04	240
E	0.99	1.05	1.05	0.90	1.11	1.12	170
F	0.98	1.03	1.06	0.85	1.15	1.17	338
G	0.97	1.06	1.04	0.89	1.08	1.09	21
H	1.11	1.20	1.17	1.04	1.21	1.22	103

<i>Panel B: Direct alpha</i>							
Institution	S&P 500	Russell 2000	TA 125	NASDAQ	MSCI World	MSCI ACWI	Num.of Funds
A	0.59	4.43	5.06	-3.77	5.84	6.35	87
B	-2.08	-0.53	4.03	-6.39	2.83	3.22	245
C	-2.09	0.02	2.73	-6.47	2.76	3.19	260
D	-4.58	-2.75	0.80	-8.61	0.60	1.14	240
E	-0.82	0.40	2.41	-5.61	3.34	3.73	170
F	-0.76	0.36	1.68	-5.21	4.06	4.32	338
G	-0.97	3.31	2.70	-5.67	4.23	4.78	21
H	2.18	5.35	7.86	-1.88	7.53	8.01	103

Table 3: **Public market equivalent by fund type**

This table provides estimates of public market equivalent by pooling all cash flows and net asset values of each fund type. We report performance separately for local and foreign funds. A fund is defined as local if it is incorporated in Israel, even though a local fund may invest in foreign assets. Panel A provides information on different types of equity-related funds and the PME's are based on the S&P 500 and Tel Aviv 125 indices as benchmarks. We use ETFs tracking these indices. The 'SPDR' ETF to benchmark against the S&P 500 and 'KESEM TA 125' to benchmark against the TA 125. The ETFs can be found on 'investing.com.' Panel B provides information on the performance of debt funds which we benchmark using ETFs of two high yield debt indices: (1) ICE BofA US High Yield Index Option-Adjusted Spread and (2) iShares iBoxx \$ High Yield Corporate Bond ETF. Cash flows, NAVs and returns are all converted to local currency.

<i>Panel A: Equity Funds</i>			
	S&P 500	TA 125	Num. of Funds
Private Equity			
Foreign	0.96	1.09	337
Israel	0.98	1.22	184
Venture Capital			
Foreign	0.84	0.9	62
Israel	0.86	1.12	167
Real Estate			
Foreign	0.8	0.92	120
Israel	0.93	1.09	12
Infrastructure			
Foreign	0.91	0.97	22
Israel	0.98	1.11	13
Hedge Funds			
Foreign	1.03	0.99	189
Israel	0.92	0.98	42
<i>Panel B: Debt Funds</i>			
	High Yield Bond	ishares HY	Num. of Funds
Foreign	0.93	0.97	73
Israel	1.08	1.11	7

Table 4: **Foreign and Israeli fund performance**

This table provides estimates of heterogeneity in fund performance across Israeli and foreign funds. The dependent variable is the public market equivalent of each fund utilizing three benchmarks: Tel Aviv 125, S&P 500, and the Russell 2000. We use the ETFs which track these indices, 'KESEM TA 125' ETF to benchmark against the TA 125; the 'SPDR' ETF to benchmark against the S&P 500; and 'iShares Russell 2000' ETF to benchmark against the Russell 2000. Cash flows, NAVs and returns are all converted to local currency. The dummy variable *Israel* equals one if the fund is local and zero otherwise. We include controls for the vintage year of the fund, the identity of the limited partner, and the type of the fund (buyout, VC, infrastructure, hedge fund, real estate, and debt). Buyout funds are the omitted category. Standard errors clustered at the fund level are reported in parentheses. *, **, and *** represent significance at the 0.1, 0.5, and 0.01 levels, respectively.

	TA 125			S&P 500			Russell 2000		
Israel	0.164*** (0.0316)	0.157*** (0.0325)	0.131*** (0.0362)	0.0937*** (0.0282)	0.0875*** (0.0289)	0.0764** (0.0322)	0.120*** (0.0289)	0.115*** (0.0296)	0.0939*** (0.0330)
Debt Funds			-0.220*** (0.0641)			-0.141** (0.0571)			-0.159*** (0.0585)
Hedge Funds			-0.157*** (0.0447)			-0.0551 (0.0398)			-0.0684* (0.0407)
Infrastructure Funds			-0.139 (0.0960)			-0.146* (0.0855)			-0.146* (0.0875)
VC Funds			-0.114** (0.0466)			-0.0855** (0.0416)			-0.0653 (0.0425)
Real Estate Funds			-0.165*** (0.0525)			-0.167*** (0.0468)			-0.168*** (0.0478)
Other Funds			-0.0947 (0.0804)			0.00518 (0.0716)			-0.00982 (0.0733)
Vintage Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
LP FE	NO	YES	YES	NO	YES	YES	NO	YES	YES
Observations	1371	1371	1371	1371	1371	1371	1371	1371	1371
R^2	0.118	0.129	0.145	0.048	0.068	0.081	0.073	0.092	0.105

Table 5: **Comparison with data from Preqin**

This table provides a comparison between the performance of private equity and venture capital funds, local and foreign, in our data set and on Preqin. We measure public market equivalent relative to the 'SPDR' ETF to benchmark against the S&P 500. Panel A includes the average PME for funds listed in our data set and in Preqin under the exact same LP and have cash flows reported in Preqin. Panel B includes funds listed in our database and in Preqin under the exact same LP for funds with no cash flows reported in Preqin. Panel C includes the funds listed in our data set but not in Preqin. The columns present the PMEs in each data set and the number of funds. Cash flows, NAVs and returns are all converted to local currency.

<i>Panel A: Funds in both data sets under the same LP and have cash flow in Preqin</i>			
	PME, our data	PME, Preqin	Num. of Funds
PE Foreign	1.02	1.02	82
PE Israel	0.97	1.02	5
VC Foreign	0.93	0.84	6
VC Israel	1.41	1.19	5
All Funds	1.03	1.02	98

<i>Panel B: Funds in both data sets under the same LP but no cash flows in Preqin</i>			
	PME, our data	PME, Preqin	Num. of Funds
PE Foreign	0.91	-	63
PE Israel	1.15	-	27
VC Foreign	0.82	-	33
VC Israel	0.93	-	53
All Funds	0.94	-	176

<i>Panel C: Funds listed in our database but not in Preqin</i>			
	PME, our data	PME, Preqin	Num. of Funds
PE Foreign	0.91	-	99
PE Israel	0.94	-	28
VC Foreign	0.96	-	6
VC Israel	0.99	-	38
All Funds	0.97	-	219

Table 6: **Comparison of fund IRR in Preqin and in our data set**

This table provides a comparison between the performance of private equity and venture capital funds, local and foreign, in our data set and on Preqin, using IRR as a performance metric. Panel A includes the average IRR for funds which are listed in our data set and also in Preqin and have cash flow data in Preqin. Panel B includes funds that are listed in our data set and also in Preqin, but do not have cash flow data in Preqin. Panel C includes the funds which are held by our LPs but are not listed in Preqin. Cash flows, NAVs and returns are all converted to local currency.

<i>Panel A: Funds in both data sets under the same LP and have cash flow in Preqin</i>			
	IRR, our data	IRR, Preqin	Num. of Funds
PE Foreign	12.06 %	12.38 %	72
PE Israel	-6.79%	-6.46%	5
VC Foreign	6.87%	6.64%	4
VC Israel	26.1%	19.05%	5
All Funds	11.54%	11.41%	86

<i>Panel B: Funds in both data sets under the same LP and do not have cash flow in Preqin</i>			
	IRR, our data	IRR, Preqin	Num. of Funds
PE Foreign	3.74%	-	72
PE Israel	10.40%	-	27
VC Foreign	2.36%	-	35
VC Israel	2.27%	-	53
All Funds	4.03%	-	187

<i>Panel C: Funds listed in our data set but not in Preqin</i>			
	IRR, our data	IRR, Preqin	Num. of Funds
PE Foreign	2.57%	-	99
PE Israel	4.93%	-	28
VC Foreign	7.77%	-	6
VC Israel	4.06%	-	38
All Funds	3.85%	-	179

Table 7: **Fund size and country comparison**

This table presents a comparison of the country of incorporation and the average fund size, in millions of U.S. dollars, of PE and VC funds in our data set and in Preqin. Panels A and C present the distribution of countries and average fund size for funds which are listed in our data set and in Preqin. Panels B and D present the distribution of countries and average fund size for funds included in our data set but not in Preqin. The fund size and country of incorporation for overlapping funds are collected from Preqin. The data for the non-overlapping funds are collected from our LP's and the missing information is hand-collected from the fund websites.

<i>Panel A: Number of funds listed in our data set and in Preqin</i>					
	U.S.	Israel	UK	Other	Total
Private Equity	105	32	35	5	145
Venture Capital	20	58	2	5	85
<i>Panel B: Number of funds listed in our data set but not in Preqin</i>					
	U.S.	Israel	UK	Other	Total
Private Equity	76	28	7	16	127
Venture Capital	3	38	-	3	44
<i>Panel C: Average size (Millions of dollars) of funds listed in our data set and in Preqin</i>					
	U.S.	Israel	UK	Other	Total
Private Equity	4,050	312	4,788	2,470	3,243
Venture Capital	545	131	2,202	193	257
<i>Panel D: Average size (Millions of dollars) of funds listed in our data set but not in Preqin</i>					
	U.S.	Israel	UK	Other	Total
Private Equity	1,920	191	322	451	1,342
Venture Capital	185	167	-	730	405

Table 8: **Probability of being included in the Preqin data set**

This table presents Probit regressions estimating the effect of private equity and venture capital fund characteristics on the probability of being listed in the Preqin data set. We estimate the effect of fund performance using the PME, relative to the 'SPDR' ETF which tracks the S&P 500, and the IRR. Cash flows, NAVs and returns are all converted to local currency. We estimate the effect of fund size, in millions of US dollars; vintage year, with funds established before 2008 are the omitted category; and country of incorporation, with funds located in the US are the omitted category. We perform this estimation on three sub-samples: Funds located in the US; funds located outside the US and the whole sample. Standard errors are reported in parentheses. *, **, and *** represent significance at the 0.1, 0.5, and 0.01 levels, respectively.

	PME			IRR		
	(US)	(Non-US)	(All Funds)	(US)	(Non-US)	(All Funds)
Performance	1.359*** (0.478)	0.417* (0.252)	0.633*** (0.224)	0.0115* (0.00678)	0.00954 (0.00586)	0.0103** (0.00432)
Log(AUM)	0.138** (0.0683)	0.267*** (0.0701)	0.173*** (0.0530)	0.109 (0.0725)	0.241*** (0.0728)	0.159*** (0.0557)
Vintage (2008 - 2010)	-0.754 (0.524)	-0.0242 (0.376)	-0.345 (0.289)	-0.483 (0.522)	-0.205 (0.381)	-0.441 (0.294)
Vintage (2011 - 2013)	-0.533 (0.489)	-0.684** (0.343)	-0.686** (0.279)	-0.0929 (0.515)	-0.810** (0.366)	-0.618** (0.295)
Vintage (2014 - 2019)	-0.388 (0.435)	-0.936*** (0.277)	-0.674*** (0.231)	-0.0408 (0.443)	-0.907*** (0.295)	-0.600** (0.241)
US			-1.182** (0.556)			-1.046* (0.555)
Europe			-0.794 (0.574)			-0.619 (0.577)
Israel			-0.828 (0.562)			-0.592 (0.560)
Observations	150	213	363	137	201	338
Pseudo R^2	0.0705	0.1205	0.0755	0.0364	0.1052	0.0620

Table 9: **Probability of having cash flows reported in Preqin**

This table presents Probit regressions estimating the effect of PE and VC funds characteristics on the probability of having cash flow information reported in Preqin (the sample include only funds listed in Preqin). We estimate the effect of fund performance using the PME (relative to the 'SPDR' ETF which tracks the S&P 500), and the IRR. Cash flows, NAVs and returns are all converted to local currency. We estimate the effect of fund size (in millions of US dollars), vintage year (funds established before 2008 are the omitted category) and country of incorporation (funds located in the US are the omitted category). We perform this estimation on three sub-samples: Funds located in the US; funds located outside the US; and the whole sample. Standard errors are reported in parentheses. *, **, and *** represent significance at the 0.1, 0.5, and 0.01 levels, respectively.

	PME			IRR		
	(US)	(Non-US)	(All Funds)	(US)	(Non-US)	(All Funds)
Performance	1.048* (0.535)	0.459* (0.275)	0.417* (0.236)	0.0141* (0.00797)	0.0109 (0.00735)	0.0117** (0.00548)
Log(AUM)	0.519*** (0.122)	0.848*** (0.132)	0.643*** (0.0919)	0.554*** (0.131)	0.813*** (0.125)	0.728*** (0.104)
Vintage (2008 - 2010)	0.791 (0.746)	0.395 (0.495)	0.515 (0.401)	0.494 (0.768)	0.262 (0.495)	0.245 (0.414)
Vintage (2011 - 2013)	1.958*** (0.689)	0.407 (0.431)	0.967*** (0.361)	1.451** (0.718)	0.257 (0.459)	0.626* (0.380)
Vintage (2014 - 2019)	1.568*** (0.592)	-0.372 (0.407)	0.518* (0.308)	1.260** (0.637)	-0.462 (0.422)	0.247 (0.325)
US			0.439 (0.440)			0.664 (0.478)
Europe			0.126 (0.475)			0.131 (0.513)
Israel			0.290 (0.477)			0.566 (0.514)
Observations	99	154	253	93	153	246
Pseudo R^2	0.2725	0.4767	0.4027	0.2749	0.4716	0.4346

8. Appendix

Table A1: **Number of commitments by vintage years**

This table provides the aggregate number of commitments by the LPs in our data set throughout the vintage years, divided into the different types of funds. Panel A presents the commitments to funds that are located in Israel and Panel B presents the commitments to foreign funds.

<i>Panel A: Israeli funds</i>						
Vintage	PE	VC	Infrastructure	Real esate	Debt	Hedge
2005	21	17	-	2	-	2
2006	25	10	-	-	-	3
2007	5	18	-	-	-	6
2008	33	34	-	2	-	6
2009	14	4	-	-	5	1
2010	7	-	-	1	-	1
2011	13	5	2	1	-	-
2012	13	8	1	1	1	
2013	8	2	1	-	2	3
2014	17	8	2	2	2	2
2015	17	13	5	4	2	-
2016	28	11	5	1	6	3
2017	20	6	5	3	3	17
2018	11	20	5	-	-	12
Total	237	201	26	17	21	56

<i>Panel B: Foreign funds</i>						
Vintage	PE	VC	Infrastructure	Real esate	Debt	Hedge
2005	12	5	2	14	6	22
2006	14	5	1	6	12	35
2007	18	7	1	16	18	22
2008	44	5	1	26	5	45
2009	6	-	-	1	-	19
2010	9	1	-	4	-	15
2011	24	4	-	3	1	8
2012	21	2	-	3	1	8
2013	15	1	1	1	2	6
2014	32	2	-	6	2	9
2015	45	8	1	14	4	1
2016	62	12	4	16	14	8
2017	41	5	-	23	12	4
2018	50	8	11	29	8	3
Total	402	74	27	164	85	226

Table A2: **Total amount of commitments (Millions US Dollars) by vintage years**

This table provides the aggregate amount of commitments (Millions US Dollars) by the LPs in our data set throughout the vintage years, divided into the different types of funds. Panel A presents the commitments to funds that are located in Israel and Panel B presents the commitments to foreign funds.

<i>Panel A: Israeli funds</i>						
Vintage	PE	VC	Infrastructure	Real esate	Debt	Hedge
2005	80	37	-	3	-	12
2006	122	17	-	-	-	11
2007	49	74	-	-	-	37
2008	291	205	-	10	-	21
2009	205	51	-	-	155	1
2010	96	-	-	13	-	7
2011	194	37	7	0	-	-
2012	183	39	31	2	2	-
2013	141	10	0	-	1	24
2014	224	18	1	31	5	9
2015	242	74	65	97	22	-
2016	155	78	24	-	4	23
2017	112	12	11	3	7	121
2018	127	56	25	-	-	91
Total	2,251	722	163	159	197	356

<i>Panel B: Foreign funds</i>						
Vintage	PE	VC	Infrastructure	Real esate	Debt	Hedge
2005	145	24	18	93	35	166
2006	150	22	9	76	74	225
2007	157	61	18	120	109	138
2008	724	15	10	132	25	343
2009	61	-	-	19	-	35
2010	145	4	-	48	-	152
2011	373	57	-	23	0	6
2012	324	4	-	120	10	20
2013	230	13	11	22	134	37
2014	843	29	-	147	53	123
2015	1,089	47	4	260	102	-
2016	1,037	122	55	119	249	36
2017	843	91	-	323	463	64
2018	711	45	347	433	474	22
Total	6,892	580	506	1,953	1,729	1,452

Table A3: Performance of private equity and venture capital funds – Nostro accounts VS. savings products

This table provides average PME measures (PME) for PE and VC funds invested in by each of the institutions in the sample with a Nostro account, as well as saving products managed for external savers. The labels correspond to the institutions' labels in earlier tables. The PME values are calculated relative to an ETF tracking the S&P 500: the '[SPDR](#)' ETF. Cash flows, NAVs and returns are all converted to local currency.

Institution	B	C	E	F	G
Provident Funds	0.97	1.35	0.88	0.91	1.06
Life Insurance	0.91	0.88	0.89	0.94	0.98
Pension Funds	0.97	0.92	0.88	0.96	1.02
Nostro Account	0.93	0.88	0.84	1.21	0.97