

# Impact Investing<sup>\*</sup>

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# Impact Investing

## Abstract

We study investments in impact funds, which we define as venture or growth private equity with a stated intent to generate both financial returns and positive externalities. In a choice-of-funds framework covering 3,500 limited partners, 5,000 funds, and 25,000 capital commitments and controlling for general determinants of fund choice, we find a 13.5% higher investment rate for impact funds compared to the benchmark investment rate of traditional venture funds. Our results imply that the supply of impact funds is incomplete, failing to meet demand. Certain types of investors drive the effect: development organizations, foundations, banks, insurance companies, and public pension funds. This set of impact investor types encompasses those with externalities in their utility function as well as those who respond to political, regulatory or local goodwill incentives to incorporate social responsibility in investing (SRI). Further, when investors signal their demand for impact or adherence to SRI principles by being a United Nations Principles for Responsible Investment (UNPRI) signatory, the excess demand for impact funds increases to 25% higher than the baseline rate by expanding the list of impact investors to include private pensions and institutional asset managers who have SRI branding.

JEL classification: G1, G2

Keywords: socially responsible investment; impact investment; private equity; venture capital; UN principles of responsible investment; sustainable investing; corporate social responsibility.

If a long-lived global social planner existed, a number of social and environmental problems would be on her list of items to fix. The fixes would likely not be limited to Coasean taxes on those causing the problems, and the outcomes would likely not be Pareto improving to all bearing the costs. The world lacks a social planner to mandate fixes and allocate costs, and instead, if fixes to social and environmental problems are to be achieved, someone must voluntarily provide capital. Governments are an obvious source of capital, but government programs are generally locally confined and can be inefficient. Philanthropies are a second source of capital, but philanthropies lack the scale to fundamentally fix the global problems at hand. The other pool of untapped funds is the private financial capital of households and organizations.

Private capital has the scale required to fundamentally address global social and environmental challenges, but traditional financial instruments and intermediaries are designed to maximize financial returns for the providers of capital rather than generate positive externalities. Yet, as of 2015, nearly 1400 organizations representing \$59 trillion in asset under management have signed the United Nations Principles of Responsible Investment (UNPRI). The massive response to the UNPRI suggests the existence of latent demand for positive externalities (impact) in investing. Likewise, virtually all major consulting groups have a social impact practice to meet a growing interest by organizations, and all major investment banks have an impact division to meet private wealth and institutional demand for social considerations in investment. Even with all of these signals of demand, what we observe is that the investors have deployed very little private capital with the expressed intent of generating social impact. Our agenda is to shed light on whether this inaction is due to a lack of demand by the constituents or because of the limited range of financial instruments and the rules and regulations governing investment practices.

Our contributions can be framed in questions covering four topics: (i) Is the supply of impact investment opportunities meeting the demand for impact? (ii) Related, is the UNPRI signatory status a marker of demand? (iii) Does the preference for impact depend on the investor type (e.g., a public pension fund vs. endowment)? While we delve into the topic of investor heterogeneities, we explore two sub-questions. (iii.a) Can the nature of constituents of capital, the intermediation, or the regulation explain the variation in results across investor types? (iii.b) Can these investor types and their attributes help us understand any UNPRI role as a facilitator of demand? Finally, we discuss work in progress on the topic of returns: (iv) What is the expected return proposition that induces a given level of demand for impact versus non-impact funds?

Impact investing as an asset class has emerged to mobilize private capital for public good, especially through private equity funds (growth and venture funds). What distinguishes impact investment from socially responsible investment (SRI) movements or direct investment in social enterprises is its

focus on the deployment of capital with an expressed intent for the investments to provide a social and/or environmental return in addition to financial returns. Sometimes impact investment is defined more broadly to meet the needs of investors or agents, but we stick to the narrower, but more precise definition. Impact investing stands in contrast to the long-standing tradition of SRI negative screening, where investors eschew investments in companies that engage in objectionable practices (e.g., the divestment of South African companies during the period of apartheid, negative screening of tobacco and fossil fuel companies). Impact investing also stands in contrast to SRI positive investments, which are purely financially-motivated investments that target sectors, geographies or companies with the expectation of an underpricing of a macro factor related to environmental or social goods. Impact investing also differs from direct investments in social enterprises (often in the form of grants or subsidized loans); the latter has a primary agenda of social returns, with any residual financial returns being second order.

To gauge the demand for impact, we first construct a sample of impact funds. We limit our analysis to venture and growth capital funds because of the lack of impact investing in buyout-oriented private equity funds. We refer to venture and growth capital together as VC for ease of exposition, although it is an unfair shorthand for the growth investments. Using a strict criterion that the fund must state a dual objective in its motivation, we hand-collect a sample of 161 impact funds launched over the period 1989-2014.

Then, using a Preqin dataset containing more than 25,000 capital commitments by more than 3,500 investors to more than 5,000 funds, we estimate a general model where investors (which we call limited partners or LPs) choose whether or not to invest in each fund active in fundraising that year. Our investment choice model includes all observable factors that might explain the LP demand for funds (LP characteristics, fund characteristics, and the relation between VC fund and LP, time effects, and LP fixed effect proxies). Our goal is to saturate the model, absorbing differences in funds, LPs, and relationships that might explain choice other than impact status. Our analysis yields four principle findings.

First, we find that the impact fund designation has a positive effect on the probability that an LP invests in the fund. The interpretation is somewhat subtle in our choice framework; LPs exhibit 13.5% higher investment rates in impact funds relative to the supply of impact funds than they do in non-impact funds relative to the supply of non-impact funds. Specifically, an investor invests in 0.82 out of every 100 funds offered in the vintage year, yet invests in 0.93 out of every 100 impact funds. Assuming the market for VC funds is complete (in equilibrium with supply meeting demand), our results imply that the supply of impact funds is incomplete, failing to keep up with demand.

Second, we document that the demand for impact is higher for UNPRI signatories. In particular, for LPs with the UNPRI marker, the investment rate into impact funds is 25% higher than it is in non-impact fund (investing in 1.4 out of every 100 impact funds rather than 1.1 funds generally).

Third, the demand for impact depends on the source of capital (i.e., type of LP). To examine the source of investor heterogeneities in their demand for impact, we manually classify all Prequin LPs into one of 10 investor types reflecting the ultimate providers of capital: development organizations, foundations, banks, insurance companies, endowments, corporate/government portfolios, institutional asset managers, wealth managers, private pensions, and public pensions. A simple univariate comparison of impact and non-impact fund investments reveals the very important role of both development organizations and public pensions in the demand for impact funds. Our choice framework allows us to draw a more comprehensive inference: We find excess demand for impact by development organizations (18.4% increase in demand), foundations (10.6%), banks (22.9%), insurance companies (23.7%), and public pensions (15.8%). By contrast, some investors eschew impact funds, including endowments (-31.4%) and (with less precision) private pensions and corporate/government portfolios. Furthermore, when split on UNPRI designation, we find that asset managers and private pensions who are signers also have positive demand for impact (but not the non-signers).

We discuss how different LP types likely have different motives and face different institutional and/or regulatory constraints when investing that lead to the observed variation in the demand for impact. For example, development organizations and foundations have stated impact objectives. By contrast, banks, insurance companies, and public pensions face political or regulatory pressure to invest locally or in underserved communities, and also benefit from local goodwill. Public pensions, despite their being subject to strong fiduciary duty (at least in the U.S.), tilt toward impact funds, which suggests that the political pressure they face is perhaps stronger than the fiduciary duty constraint. In contrast, private pensions overall do not tilt towards impact funds, which is consistent with the federal regulation (ERISA) being a major friction. For banks and insurance, both the regulatory incentives (e.g., Community Reinvestment Act for U.S. banks and some state-level variants for U.S. insurance companies) and corporate social responsibility (CSR) motives are possible sources of their demand for impact. Finally, foundations exhibit positive tilts towards impact funds but overall their share among impact funds is small. This finding is intriguing since foundations are mission-based and should be attracted to impact investments as a means of fulfilling their missions. However, IRS restrictions on program-related investments may restrict the ability of foundations to pursue impact investments.

Fourth, our final question asked whether investors have different ex-ante return expectations for for impact versus non-impact funds at the time of investing decisions. What we find is a more subtle answer that also depends on investor type. To gauge expected returns, we use a lagged moving average of prior performance in the fund family series, following the literature on persistence of returns (e.g., Kaplan and Schoar, 2005). We interact this performance measure with our key impact dummy variable to investigate differences in how investors respond to expected returns of impact v. traditional fund

investments. The results are too preliminary to report in this draft, but what we find is that LPs divide into two classes on how they empirically seem to view the role of expected returns in generating demand. The first set of impact investors, which includes banks, public pensions, and foundations, is insensitive to expected returns when deciding on impact fund choice. Our inference is that they invest with primarily an externality goal in mind (e.g., local community development for a CRA-oriented bank or politicized public pension or perhaps financial inclusion or education innovation for a foundation) and/or they expect relatively sharp tradeoffs between financial return and impact. The second set of impact investors includes development organizations, insurance, and UNPRI private pensions. For these investors, we find that the expected return required to induce a certain level of demand for an impact fund is lower than the expected return required to induce the same level of demand for a non-impact fund. Such a result would suggest a utility function over both impact and externalities. These are still very preliminary results as of this draft and much additional work is clearly needed.

Although our emphasis is on demand for impact in investing, we make several contributions to the literature on demand for VC funds and how investors choose VC investments. We find that among a wide array of variables that describe fund and LP characteristics, and in striking contrast to the predictions of standard asset pricing models, two variables emerge as the primary drivers of fund choice for all the LP investor types – the prior investment relationship between the LP and VC firm and the geographic proximity between the LP and the VC firm. While prior studies document the importance of relationship or geography in LP choice of funds (e.g., Lerner, Schoar and Wongsunwai (2007); Hochberg, Ljungqvist, and Vissing-Jørgensen (2014); Hochberg and Rauh (2014)), our results document that the economic significance of these variables is enormous, particularly when compared to a myriad of other fund and LP characteristics. For example, the partial Tjur  $R^2$  of the prior relationship variable accounts for 85% of all explained variation, while the geographic proximity variable accounts for the majority of the remaining explained variation.

Our paper connects to the literature on variation in institutional preferences for securities in public markets. For example, Gompers and Metrick (2001) document the growth in institutional ownership in public markets and the resulting increased demand for large stocks. Bennett, Sias, and Starks (2003) document that over time the institutional appetite for small and risky stocks has grown. Bialkowski and Starks (2016) document that demand for SRI mutual funds has grown faster than conventional mutual funds in recent years, fueled by investors' nonfinancial considerations. As in public markets, we show that the demand for private equities in general and that for impact in particular depends on the composition of investor (LP) types.

Our paper also relates to the growing private equity literature. Demand is central to our analysis, with a motivation akin to Lerner, Schoar and Wongsunwai (2007) who write “investors vary in their

sophistication and potentially their investment objectives.” While we focus on the demand for impact in our analysis, our analysis contributes more broadly to the literature on the determinants of the demand for private equity. While Lerner et al. (2007) and Sensoy, Wang and Weisbach (2014) compare returns earned by different types of LPs, the maintained assumption is that all LPs want to maximize financial returns, though they differ in their skill or access. In contrast, we focus on understanding the importance of nonfinancial fund attributes as determinants of the investor demand for private equity, and the sources of investor heterogeneities in their demand for nonfinancial considerations such as impact.

Our contributions also extend to testing the demand for (and frictions against) impact investments, across LP types. There is now a burgeoning literature, spread across multiple disciplines, on socially responsible investing (SRI) that dates back as far as Milton Friedman’s doctrine on responsible investing.<sup>12</sup> A survey by Renneboog, Ter Horst, and Zhang (2008) highlights the tension of SRI investing, concluding that investors in SRI funds may (but not with certainty) be willing to knowingly forego some expected financial returns for social or moral considerations. Consistent with the idea that investors in SRI funds value attributes other than performance, Benson and Humphrey (2008) and Bialkowski and Starks (2016) show that SRI fund flows are less sensitive to performance than non-SRI flows while Bollen (2007) documents SRI funds have less volatile flows. Similarly, Hong and Kacperczyk (2009) hypothesize that stocks subject to widespread negative investment screens earn strong returns. Consistent with this notion, sin stocks (e.g., tobacco and gambling stocks) sport attractive valuation ratios and earn high returns. These findings are consistent with the notion that some investors value nonpecuniary motives when investing.

We contribute to this extant literature by inferring investor demand for impact from the fund choices in their private equity portfolios. To the best of our knowledge, our paper is the first to manually collect data on impact funds and to examine investor demand for funds within a broad fund choice framework. In particular, we shed light on rich heterogeneity among LPs in their preference towards impact as inferred from their fund choices. Finally, we are also the first to use the UNPRI signatory designations of institutional investors to measure demand for impact by end-constituents and examine whether this demand by end-constituents is reflected in the actual fund choices made by the signatories.

The remainder of the paper is organized as follows. Section I describes the private equity industry, impact funds, and the research hypotheses to be examined. Section II describes the data. Section III specifies the empirical model. Section IV presents and discusses the estimation results. Section V concludes.

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<sup>1</sup> “The Social Responsibility of Business is to Increase Its Profits,” *The New York Times Magazine*, September 13, 1970.

<sup>2</sup> Also see Geczy et al. (2003) and Dimson (2015).

# I. DATA

## A. Datasets

We employ three primary datasets. First, we use Preqin’s Investor Intelligence data to identify LP investments in funds (the fund-LP dataset). Because the majority of impact funds are venture or growth oriented, we restrict our analysis to venture and growth funds with vintage years ranging from 1985 to 2014.<sup>3</sup> We augment this with Preqin’s Performance Analyst database of fund performance. The resulting VC/growth fund dataset covers about 3,500 LPs and 5,000 funds, which result in over 25,000 LP capital commitments. The dataset includes detailed information on LPs (including LP name and location) and funds (including fund name, fund family name, size, industry focus, and fund manager’s performance record from previous funds managed by the same fund family).

Our second dataset is a hand-collected dataset of 161 impact funds, which we define as a fund with a stated objective of generating a positive externality (e.g., addressing climate change, generating jobs, reducing poverty, or reducing world hunger). We summarize the steps used to identify impact funds here, but provide details in an online data appendix. We start with the universe of funds in Preqin’s Performance Analyst database. From these funds, we identify potential impact funds from a combination of keyword searches of articles about funds and managers, third-party lists of funds and managers, and a screen based on funds’ geographic focus on poverty-stricken countries/regions. After compiling a set of potential impact funds, we manually read articles about funds and their managers to verify the impact orientation of the fund. This step ensures that our sample of impact funds is clean. However, we recognize that there are likely some impact funds that do not make our sample because we simply lack information on the funds. Additional data requirements (e.g., requiring information on LPs invested in the fund) further reduce the sample to 161 impact funds and 828 capital commitments.

Impact funds have diverse goals, so it is useful to consider specific examples of impact funds in our final sample. Bridges Ventures is a London-based family of funds “...dedicated to sustainable and impact investment...” that uses an “...impact-driven approach to create returns for both investors and society at-large...”<sup>4</sup> that has several funds in our sample including the CarePlaces Fund, which builds care homes for the elderly. Its limited partners include university endowments, banks, pension funds, and high-net-worth investors. NGEN Partners is a Manhattan-based family of funds that “...invests in companies that positively improve the environment and human wellness” and manages three funds in our impact dataset (NGEN Partners I and II, and NextGen Enabling Technologies Fund). The North Texas

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<sup>3</sup> We also include fund of funds that primarily invest in VC funds.

<sup>4</sup> Company website, November 17, 2015 (<http://bridgesventures.com/about-us/>).



Opportunity Fund is a Dallas-based family of funds that “...seeks to invest in companies located in or willing to expand operations to underserved North Texas region markets, with a special emphasis on the southern sector of Dallas. The firm invests in minority or women owned or managed companies located anywhere in North Texas.”<sup>5</sup> The final example is the Leapfrog Financial Inclusion Fund, an emerging market, financial services fund that “...invests capital, people and knowledge in purpose-driven businesses, helping them to grow, to be profitable and to have real social impact.”<sup>6</sup> It counts among its limited partners a foundation, development organizations, an insurance company, and a pension fund.

Our final dataset is a list of UNPRI signatories, which we downloaded from the UNPRI website (<http://www.unpri.org/signatories/signatories/>). As of November 16, 2015, there were 1422 signatories (297 asset owners, 931 investment managers, and 194 professional service managers) who collectively manage \$59 trillion. The UNPRI pledge states:

*As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time). We also recognize that applying these Principles may better align investors with broader objectives of society. Therefore, where consistent with our fiduciary responsibilities, we commit to the following:*

- 1. We will incorporate ESG issues into investment analysis and decision-making processes.*
- 2. We will be active owners and incorporate ESG issues into our ownership policies and practices.*
- 3. We will seek appropriate disclosure on ESG issues by the entities in which we invest.*
- 4. We will promote acceptance and implementation of the Principles within the investment industry.*
- 5. We will work together to enhance our effectiveness in implementing the Principles.*
- 6. We will each report on our activities and progress towards implementing the Principles.*

We match UNPRI signatories to our LP dataset using investor names. LPs that are subsidiaries of a UNPRI signatory are also coded as signatories, but not LPs who are parents of UNPRI signatory subsidiaries.

## ***B. Limited Partners Statistics***

### *B.1 Limited Partners Statistics: General LPs*

Much of our analysis focuses on how the demand for VC in general and impact funds in particular varies across different LP types. To categorize LP Types, we conduct web searches for all LPs and categorize them into one of 10 LP types (Development Organization, Foundation, Bank, Insurance, Endowment, Corporation/Government Portfolio, Institutional Asset Manager, Wealth Manager, Private Pension, Public Pension). Development organizations include multinational, national, and regional organizations that invest with development purposes in mind (e.g., International Finance Corporation, Ireland Strategic Investment Fund, New Mexico State Investment Council, and Norfund). Corporation &

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<sup>5</sup> <http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=156715>

<sup>6</sup> <http://www.leapfroginvest.com>

Government Portfolios include corporations who invest in VC (e.g., Cisco and Siemens), state-owned corporations (e.g., China Steel and China Oceanwide Holdings), and sovereign wealth funds that are not development-oriented (e.g., Abu Dhabi Investment Authority). Institutional Asset Managers include LPs who manage money for a diverse institutional client base (e.g., Adams Street Partners, JP Morgan Asset Management), so the source of institutional capital and its constituents are mixed. Wealth Managers include family offices (e.g., Merrion Family Trust) and advisers who serve high net worth clients (e.g., BNY Mellon Wealth Management). Private pensions are primarily corporate pensions (e.g., IBM Retirement Fund and HP Pension Fund) and multiemployer retirement funds (e.g., Carpenters' Pension Fund of Illinois and UFCW Pension Fund), but also include asset managers specializing in private pension portfolios. Public pensions include city, state, and national pension funds and asset managers catering to public pensions. The remaining LP types (foundation, bank, and insurance) are self-explanatory.

In Table 1, Panel A, we provide descriptive statistics on LPs. The smallest categories in terms of LP counts are endowments and wealth managers, but even these have over 200 distinct LPs participating in the market. The total number of capital commitments by LP type generally mirrors the patterns of LP numbers with some notable exceptions. Public Pensions represent only 11 percent of LPs, but tend to be large and thus generate about a quarter of capital commitments. Private Pensions and Development Organizations also have a larger share of capital commitments relative to their share of LPs. In contrast, Banks and Corporations and Government portfolios tend to make relatively few investments. Across LP types, these patterns are similarly reflected in the average number of capital commitments per LP. On average, an LP makes capital commitments to about 7 funds over our sample period (last column), but this varies by LP type. On average, Public Pensions invest in the most funds (16.67), followed by Private Pensions (9.35 funds) and Development Organizations (8.14 funds). In terms of the timing of investment, Public Pensions, Private Pensions, Endowments, and Insurance Companies were active in earlier vintage years, while Banks, Corporation/Government, and Development Organizations are tilted toward later vintage years. We calculate the number of years since an LP makes its first VC investment. The average LP has about 4 years of experience as an LP, though this number is positively skewed. Public Pensions, Private Pensions, and Endowments are the most experienced LPs.

In Table 1, Panel B, we present the regional distribution of LP headquarters. We present the percentage of LPs that fall into each of eight major regions. Focusing on all LPs (last column of Table 1), nearly half of all LPs are in North America, while another 28.9% are in Developed Europe. However, the regional distribution of LPs varies by LP type. For example, 82.6% of Endowment LPs are in North America, while only 14.9% of Bank LPs are in North America. Relative to other LPs, Development

Organization LPs have greater presence in Emerging Europe, Africa, Central and South America, and Emerging Asia.

### *B.2 Limited Partners Statistics: UNPRI Signatories*

In the last row of Panel A, we present the percentage of each LP type that is a UNPRI signatory. By far, Institutional Asset Managers are the most likely to sign the UNPRI (19.5%), followed by Insurance (13.8%) and Public Pensions (13.5%). In Figure 1, we present the percent of LPs that sign the UNPRI (y-axis) by region (x-axis). Recall that most LPs are headquartered in developed Europe and North America, but the percent of LPs in developed Europe that sign the UNPRI is more than four times that of LPs in North America. LPs based in the developing regions of Africa, South America, and developed Asia also sign at relatively high rates.

Relative to other LPs, the UNPRI signatories tend to be more experienced and larger VC investors. On average, UNPRI signatories invest in about 15.6 funds, while other LPs invest in 6.4 funds. Similarly, on average, UNPRI signatories have 6.2 years of experience as a VC investor, while other LPs have 3.9 years.

## **C. Funds Statistics**

### *C.1 Fund Statistics: VC and Growth Funds*

We analyze capital commitments to about 5500 funds with vintage years from 1985 to 2014, though about 75% of funds have vintage years of 2000 or later. In Table 2, we present descriptive statistics on funds in Panel A.

On average, the fund size is \$194 million with a vintage year of 2004. We calculate the past fund percentile rank by first computing the percentile performance rank of all funds previously managed by the same fund family (ranked against vintage year and market cohorts), sorting the funds by vintage year, and then calculating the exponential moving average of all past fund percentile ranks with a smoothing factor of 0.5 for the fund manager fundraising fund  $i$ . The average past percentile rank for all funds is 0.52, or very slightly above the median. About a third of funds in the dataset are first-time funds, which we define as funds for which we see no prior fund offered by the family of funds. About a third of funds are missing the fund managers' past fund performance data in Preqin, though they are offered through a veteran fund family.

We use Preqin codes to identify the geographic focus of fund investments, where we collapse the geography code into 8 regions. A fund is said to have a geographic focus if 1/3 or more of all geographic descriptive labels is concentrated in a given region. Most funds (84%) focus on only one of the eight global regions. The remaining funds either are geographically diffused or have more than one geographic

focus. We use these data to construct a series of geography dummy variables that take a value of one if the fund focuses on the region. In table 2, Panel B, we present the means across funds. (Note that the percentages sum to a number greater than one because the same fund can have multiple geographic foci.) As was the case for investors (LPs), investments (funds) are also concentrated in North America and Europe.

We use Preqin codes to identify the industry focus of fund investments, where we collapse the industry codes into 11 different industries (business services, energy, consumer, industrials, information technology, health care, infrastructure, food and agriculture, real estate, and media/communications). As with geography, a fund is said to have an industry focus if 1/3 or more of all sector descriptive labels is concentrated in a given industry. A significant number of funds are self-described “diversified funds” while other funds provide a long list of sectors with no focus on one particular industry; we categorize both types of these funds as diversified funds. In table 2, Panel C, we present the means of these dummy variables across funds; as was the case with the fund geography dummies, the fund industry dummies sum to a number greater than one because some funds focus on multiple industries.

### *C.2 Fund Statistics: Impact funds*

The right side of Table 2 reports descriptive statistics for our sample of 161 impact funds. Relative to other funds, the impact funds are a bit smaller (about \$128 million), managed by fund families with substantially lower past excess IRRs (-0.68% v. 3.7%) and percentile ranks (0.42 v. 0.52), and slightly more likely to be a first time fund (38% of impact funds v. 34% of all funds).

In Panel B, we see that impact funds, relative to other funds, tilt away from developed markets and toward emerging markets with the exception of Emerging Asia, which includes China. In Panel C, we see that impact funds often focus on energy or diversified industries while there is a notable lack of investment in IT and health care.

### ***D. Fund Commitment Statistics***

In order for us to examine what types of investors demand impact investors, we need to also understand what other fund characteristics investors consider when making VC fund investment decisions in general. What could explain the matches we observe in the data between VC funds and their investors? Our data will allow us to analyze about 25,000 capital commitments to infer factors of demand.

The literature motivates three important dimensions affecting demand. First, *ceteris paribus*, investors have higher demand for funds managed by fund families with better past performance than those with poor performance (Kaplan and Schoar, 2005; Hochberg, Ljungqvist, and Vissing-Jørgensen (2014); Chung et al. (2012); Barber and Yasuda (2016)). Second, prior relationships matter. Before

committing capital to a given fund, prospective limited partners incur costs in assessing the fund manager’s current and past fund outcomes and the stated investment strategy/thesis of the follow-on fund that the fund manager is raising. This due diligence process is costlier if you have never invested in the manager’s previous funds. If you are an incumbent investor in the previous funds, you already have established personnel networks and communication channels with the fund manager, and thus you have an information advantage over outside investors in evaluating the prospective follow-on fund (Hochberg, Ljungqvist, and Vissing-Jørgensen (2014)). On the flip side, fund managers make special effort to retain investments by incumbents because of the positive signal value to outside investors. Third, as shown by Hochberg and Rauh (2014), there is a home bias in investment in private equity.

In Table 3, we present descriptive statistics on these capital commitments, focusing on the matching characteristics. In Panel A, we present the number of fund investments by LP type (columns) and LP region (rows). Here and in our later regression analysis, we analyze five regions (rather than eight) by combining Emerging Europe, Africa, and Central and South America into “Rest of the World”, and Emerging Asia and Middle East into “Emerging Asia,” but the regional distribution of capital commitments is similar to the regional distribution of LPs (see Table 1, Panel B). In Panel B of Table 2, we present the percent of fund investments where the LP region and the fund region (i.e., the geographic focus of the fund investments) are the same. All LPs place well over half of capital commitments in funds from the same region. The average LP has 75% of its portfolio focused in the local region.

In Panel C of Table 2, we present the percent of fund investments where the LP has made a prior investment with the same series of a fund. Prior relationships are quite common, particularly when we consider the fact that about one third of all funds are first-time funds (see Table 2, panel A), and first-time funds precludes the possibility of a prior fund family-LP relationship.

Before leaving this section, we highlight that while some investors aim to hold well-diversified VC portfolios across countries/regions and sectors, others may exhibit tilts towards certain segments. This could be due to information advantage, familiarity bias, or because investors desire generation of positive spillover effect on the local economy. Corporations may invest more heavily in VC funds that focus on sectors of strategic importance to them, e.g., pharmaceutical companies may invest more heavily in biotech VC funds than IT VC funds. Thus, in our methodology, we incorporate these factors of demand as well.

## II. METHOD

We analyze the factors that explain the decision of an LP investor to choose one VC fund over others. We begin by modeling this choice problem generally. Consider a market where there are  $i=1, \dots, N$

fund managers fundraising a new fund and  $j=1, \dots, M$  LPs prepared to invest.<sup>7</sup> This market generates  $NM$  possible fund-LP matches.<sup>8</sup> For each possible match, define  $INV_{ij}$  as a dummy variable that takes a value of one if LP $_j$  invests in fund  $i$  and zero otherwise. We model this general choice problem along three main dimensions:

- (1) Fund characteristics (e.g., the targeted size of the fund or the fund series' prior performance<sup>9</sup>),
- (2) LP characteristics (e.g., a large LP will invest in more funds), and
- (3) Fund-LP match characteristics (e.g., whether LP  $i$  invested with the prior funds in the series of fund  $j$  previously).

Specifically, we estimate the following logit model:

$$\text{Logit}(\pi_{ij}) = X_i\alpha + Y_j\beta + Z_{ij}\gamma + S\rho + \varepsilon_{ij}$$

where  $\pi_{ij}$  is the probability that LP  $j$  invests in fund  $i$ ,  $X_i$  is a matrix of fund characteristics,  $Y_j$  is a matrix of LP characteristics, and  $Z_{ij}$  is a matrix of match characteristics for fund  $i$  and LP  $j$ .  $S$  is a matrix of variables that we conjecture might affect the demand for impact investments.

Our goal is to use this reduced form view of demand (taking supply as given in a particular vintage year but allowing the dynamics to evolve over time) to absorb factors affecting the LP demand for a particular fund. We saturate the model with baseline determinants of LP demand to allow us to draw inference about the demand for impact funds.

To control for different baseline rates of investments across LPs (e.g., because LPs have different allocations to venture funds), we group LPs by type and baseline investment rates in the recent past. Specifically, we calculate the sum of the number of fund commitments that an LP makes in the three years  $t-1$  to  $t-3$ , a proxy for the size of their VC investment program. Then, for each of the 10 LP types, we generate fixed effects from a dummy variable that equals one if the number of investments made in the past three years equals  $y$  and if the investor's LP type equals  $j$ , for  $y = 1, 2, 3, \dots, \max(N_j)$  for the LP

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<sup>7</sup> Unlike in the mutual fund or hedge fund industry where the funds are open-ended and investors invest in and out of funds over time, private equity fund interests are closed-end and illiquid, i.e., LPs can typically invest in them only at the time of fund inception. Once investors make capital commitments they are contractually required to stay invested in the fund until fund liquidation, typically 10-12 years after the inception. Secondary markets exist but are comparatively small and opaque. Thus, we focus on investors' investment decisions at the time of fundraising for the new fund.

<sup>8</sup> Ljungqvist et al. (2006) and Bottazzi et al. (2015) use similar empirical models to examine underwriter-issuer matches and VC-portfolio company matches, respectively.

<sup>9</sup> At the time of making investment decisions during fundraising, prospective LPs observe neither the eventual size of the fund nor the fund's financial return. Instead, prospective LPs base their investment decisions on their expectations about the fund size and fund performance, among other things. We impute the expected fund size by first computing the vintage and market-specific (U.S. or non-U.S.) median fund size for each vintage year, and then calculating the 3-year average of the median fund size in market  $i$  for years  $t-1$  to  $t-3$  for a fund raised in market  $i$  and vintage year  $t$ . We proxy for the fund's expected return by using the fund manager's past fund moving average percentile rank. Note that we intentionally define the expected fund size as a *market-wide* average from the previous three years so that this variable would not vary with the fund-specific expected return.

type  $j$ . We include these LP type-specific fixed effects in the logit estimation to absorb the effect that the size of the investor's VC program might have on her propensity to invest in a given VC fund.

The key  $S$  variable is  $IMPACT_i$ , which is a dummy variable that takes a value of one for funds with a stated objective of generating a positive externality. We conjecture that impact investments have low demand relative to other VC funds from investors who maximize financial returns alone because of the potential tradeoff between financial returns and the generation of positive externalities.

We are also interested in the variation in this demand for impact investments across LP types. For example, we conjecture that development organizations will have relatively strong demand for impact funds because they are clearly interested in generating positive externalities. At the other extreme, LPs subject to strong fiduciary standards and those that manage intermediated or pooled capital will generally spurn impact investments because of the potential tension between financial returns and impact. Our empirical strategy will allow us to explore this variation by analyzing the variation in the coefficient estimate on the key dummy variable,  $IMPACT_i$ , across LP Types.

To assess whether UNPRI signatories are more likely to invest in impact funds, we interact the  $IMPACT_i$  with the UNPRI dummy variable. If the UNPRI principles are materially affecting the investment decisions of its signatories, we would expect the coefficient on this interaction variable to be positive.

In work in progress, we plan to interact the  $IMPACT_i$  with sector and geography to assess whether there is stronger demand for impact funds with a particular sector or geography focus. For example, clean tech impact funds may generate stronger demand than funds targeting the alleviation of poverty. Similarly, impact funds with a China focus may generate stronger demand than funds with a U.S. focus. Likewise, we can explore home bias in impact investing. Hochberg and Rauh (2013) document that U.S. LPs, particularly U.S. public pension funds, tilt their private equity portfolios toward local funds. There is a large literature exploring the reasons for local tilts in investor portfolios. Scholars hypothesize that informational advantages (Coval and Shumway (2001), Ivkovich and Weisbenner (2005)) and/or familiarity (Massa and Simonov (2006), Atanasova and Chemla (2014)) might drive the preference for local investments. In the context of private equity, Hochberg and Rauh (2013) conjecture that U.S. state pension funds prefer local funds because these funds can be justified as spurring state economic development. To investigate whether some LPs favor impact funds *because* of their local tilt, we interact  $GEOMATCH_{ij}$  with  $IMPACT_i$ . Finally, to assess whether LPs are more likely to invest in impact funds launched by a fund family with whom they have prior experience, we plan to analyze the interaction of  $IMPACT_i$  and a dummy variable that measures whether the LP invested in a prior fund managed by the same fund family.

### III. RESULTS

#### *A. The Demand for Impact*

The first question we posed was whether the supply of impact investing opportunities is meeting the demand. In Table 4, we answer that question in the logit model, where an observation is a potential investment by an LP into a fund. The estimation has over 3 million observations because we set up all potential investments by crossing all funds of a vintage with all LPs that make at least 1 fund investment in that vintage year. In Model (1), the key variable of interest is the Impact fund variable. In Model (2), we include the UNPRI dummy and the interaction of UNPRI with Impact. We report marginal effects rather than coefficients throughout. In addition, to measure the economic magnitude of our key results, we report scaled marginal effects, which is the marginal effect divided by the investors' base investment rate.<sup>10</sup>

It is possible that there is heterogeneity among investors in their demand for impact funds, and that variation is positively correlated with their decision to sign the UNPRI. For example, some institutional and wealth asset managers (e.g., Robeco) specialize in catering to end investors that demand SRI in their portfolio choices. Being a UNPRI signatory may elevate the credibility of these asset managers in the eyes of their target audience. For conventional asset managers whose clients do not value the SRI options, the cost associated with UNPRI compliance may be too high relative to its benefits. Similarly, some pensions may sign the UNPRI because they face political pressure to do so and use UNPRI compliance as protection against potential lawsuits for breach of fiduciary duty. In such cases, a separating equilibrium may be observed where signatories are more heavily tilted towards impact funds, reflecting the underlying demand by end investors.

Alternatively, UNPRI is signed by investors for reasons other than their demand for positive externality, e.g., some sort of “cheap talk” to satisfy their constituency for regulatory or marketing purposes. If the latter effect is dominant, then we may not see much correlation between UNPRI signatory and their likelihood to invest in impact funds relative to non-signatories of the same LP type. A third, non-mutually exclusive possibility is that larger investors tend to sign UNPRI with higher frequency than smaller investors, because the cost of compliance is more affordable for larger investors than for their smaller counterparts. Again, this effect will likely weaken any relationship between being an UNPRI signatory and being an impact investor, *ceteris paribus*.

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<sup>10</sup> In model (2) where we interact UNPRI with Impact, we use separate baseline investment rates for UNPRI signatories and non-signers.



In Model (1), being an impact fund increases investors' probability of investing in the fund by 0.0011. The base investment rate for all investors is 0.0082; an LP chooses to invest in 0.82 out of every 100 VC funds offered in the market that vintage year. (The total number of funds in our sample is 5,053 invested in by 3,503 LPs.) Thus, an increase of this rate to 0.93 out of every 100 funds is an economically significant increase of  $0.11/0.82 = 13.5\%$  in the investment rate. In the context of our choice-of-fund framework, we interpret this result as LPs exhibiting higher investment rates in impact funds relative to the supply of impact funds than they do in non-impact funds relative to the supply of non-impact funds. Assuming the market for non-impact VC funds is complete, our results imply that the supply of impact funds is incomplete, failing to keep up with demand.

Does the excess demand for impact depend on whether an LP is an UNPRI signer? In Model (2), we find that for UNPRI investors, the demand for impact is even greater. The marginal effect estimate is 0.0029, an increase of 25.3% over the base investment rate, which is 1.14 out of every 100 funds for UNPRI signers. The demand for impact is still positive and significant for non-signers, but the economic magnitude is much smaller, at only 7.1% of the base investment rate. The higher demand for impact among UNPRI signers is consistent with the possibility that some investors, e.g., wealth managers, sign the UNPRI in order to strengthen their brand vis-à-vis the SRI-conscious clientele they are trying to attract, and tilt their investments towards impact funds to satisfy their end constituents' demand. We examine this possibility more explicitly in the next section when we estimate the logit model for each of 10 LP types.

In the remaining rows of Table 4, we present estimates of how the literature-motivated other determinants of VC investing perform in explaining VC investment choice. Many of these determinants have the predicted signed effects on the investors' choice of funds. Higher performance of funds raised and managed by the family of funds in the past (interpreted either as the fund manager's skill or expected return on the current fund) has a positive and significant effect on the investor's choice probability. By contrast, missing past performance induces a negative and significant effect. Similarly, being a first-time fund has a negative effect on the investors' choice probability. Funds with larger expected fund size attract more investors, as expected. Investors with fewer years in VC investing are more likely to invest.

A new contribution we make to the literature on the determinants of investing concerns not the signs of coefficients but the relative importance of these determinants gauged in how much variation can be explained in LPs' choice of funds. As a measure of the overall goodness of fit we report Tjur  $R^2$  (Tjur (2013)) at the bottom of the table, which is the difference in the mean of the predicted probability for the two categories of the dependent variable (i.e., invested vs. non-invested funds). Furthermore, as a measure of how much incremental explanatory power each of the variables provides to the overall model, we

report partial Tjur  $R^2$  in the column to the right of Model (2), which is the improvement in the Tjur  $R^2$  from adding the corresponding variable group to Model (2).

We find that two variable groups—the prior relationship and the geographic match—are clearly the most important in capturing the variance across the fund choices of LPs. Prior investment relationships between the VC fund family and LPs explain 85% of the overall Tjur  $R^2$ , whereas geographic matches between the fund and LPs (e.g., a North American investor-North American fund pairs)<sup>11</sup> explain an additional 8.4%. LPs overwhelmingly favor investing in fund families with whom they have a prior experience and in their local regions, consistent with Lerner, Schoar and Wongsunwai (2007), Hochberg, Ljungqvist, and Vissing-Jørgensen (2014), and Hochberg and Rauh (2014), among others. The economic magnitude of these marginal effects is also very large. A case in point is the marginal effect of the positive local bias for emerging markets; the estimate is 0.0109, or more than 100% of baseline rate in “Rest of the World” (Africa, South America, and Emerging Europe). In comparison to the large partial Tjur  $R^2$  of relationship and geography match variables, the impact variable group explains a relatively modest portion of the overall Tjur  $R^2$ —about 0.1%; however, the economic magnitude of the marginal effects is large. A bit surprising perhaps is the lack of variation explained by the other attributes such as fund industry focus, fund geography, and other fund or LP characteristics, which all explain at or less than 1% of the overall Tjur  $R^2$  of the model.

### ***B. Investor Heterogeneity and the Demand for Impact***

Having shown that there is an aggregate positive demand for impact funds, in this section we examine whether the demand varies by investors type and, if so, why. We expect both development organizations and foundations to exhibit a positive tilt towards impact funds. They are typically non-profit entities with an explicit organizational goal of generating positive externalities for the region they serve (development organizations) or for the social and environmental goals of their mission (foundations).

Foundations, however, are subject to two structural frictions. In the U.S. (where most foundations reside), the IRS requires foundations to maintain 5% annual payout rate to keep their tax exemption status. In particular, foundations can make investments designated as program-

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<sup>11</sup> The geography-match variable is constructed using (i) the fund’s geographic focus and (ii) LP location for most LP types with the exception of development organizations. For development organizations, we used the LP’s mission geographic focus rather than the HQ physical location. For example, a development bank headquartered in Washington, D.C. that targets developing countries in the Americas would be a geographic match to a fund focused on Latin America. We intend to construct a similar mission-based geography match variable for foundations and funds, but this is still a work in progress, so the current estimates reflect headquarter locations for foundations rather than the mission location.

related investments (PRIs) and count these investments towards the 5% tax-exempt eligibility requirement if (i) the investment furthers the foundation's organization mission, and (ii) the financial return is not a primary purpose of the investment. In practice, PRI investors are required to demonstrate that conventional investors maximizing returns would not invest at the same term as their investment terms. This is simple if the financial instrument used is a below-market return debt security. Precisely for this reason, below-market-return loans are popular vehicles for PRIs. In contrast, equity vehicles are relatively rare, possibly because of the perceived risk of violating the IRS eligibility requirement if it makes too much profit ex post. The risk of losing tax-exempt status may suppress foundations' demand for impact investments below where it would be otherwise.

Of course, foundations also manage their endowment portfolios and they could potentially invest in impact funds via their endowment portfolios. Mission-related investments (MRIs), when they exist, are distinct from PRIs and are part of endowment investments. However, historically endowment investment decisions have tended to be detached from pursuit of the organizational mission for the foundations, and investment staff and grant-giving staff may not interact. A few high-profile foundations such as the Gates Foundation are intentionally combining the asset management side and the mission-seeking side of the foundation, but their practice seems to remain the exception rather to the rule.<sup>12</sup> To summarize, while foundations seem to be the obvious entities to invest heavily in impact funds, in practice these frictions may discourage impact investing.

Next in our list of LP types are financial institutions. In the U.S., commercial banks are subject to the Community Reinvestment Act (CRA), which is "intended to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low- and moderate-income neighborhoods, consistent with safe and sound operations."<sup>13</sup> In efforts to satisfy this CRA requirement, banks are known to give grants to community-based organizations; thus it is also plausible that banks invest in impact funds that target improving credit access for low-income neighborhoods, especially if banks can also invest locally to garner goodwill from the customers at large. Insurance companies also have some state-level CRA-like requirements to serve local communities (e.g., the State of California insurance regulation).

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<sup>12</sup> Strom (2011).

<sup>13</sup> [http://www.federalreserve.gov/communitydev/cra\\_about.htm](http://www.federalreserve.gov/communitydev/cra_about.htm)

However, to the extent that insurance companies and non-U.S. banks invest in impact funds, it is likely a reflection of corporate social responsibility motives of fostering goodwill in local markets while investing their proprietary portfolios. Likewise, endowments, corporate and government portfolios, and the broader set of constituents serviced by institutional asset managers may also have incentives to invest in impact funds to the extent that such vehicles induce goodwill-related returns from local communities or stakeholders. However, all of the institutions mentioned herein face fiduciary responsibilities, which could constrain investing in any instruments that mention externalities.

The final set of LP types concern households as the ultimate constituent. Households may derive philanthropic utility from investing in impact funds. However, as in the case for foundations, frictions also may impede impact investing, particularly for pension funds.

In the U.S., the federal guideline supplementing the 1974 Employee Retirement Income Security Act (ERISA) states that ERISA fiduciary "... may never subordinate the economic interests of the plan to unrelated objectives, and may not select investments on the basis of any factor outside the economic interest\_of the plan",<sup>14</sup> though non-financial factors can be considered when they do not adversely affect risk or returns. This strict interpretation of fiduciary duty is likely to dis-incentivize pension investors to invest in impact funds, for fear of being seen as sacrificing financial returns in return for positive externality. In other words, frictions against impact investments may operate particularly strongly for private pensions.

Private pensions are directly subject to ERISA, whereas state (public) pensions are subject to state-level regulations. In practice, state regulations often closely follow ERISA, so they may behave similarly to private pensions with respect to impact funds. At the same time, public pensions are often pressured to serve the political interests of their boards, which are often pro-labor and consider local job creation as an important policy goal. Thus, public pension investors may face a tension between the boards that pressure them to serve the local economy (e.g., by investing in impact funds that target improving welfare and employment conditions of underserved neighborhoods in the state, for example) on one hand, and the fiduciary duties they face. Interestingly, impact funds are often loath to admit the existence of any trade-offs between positive externality they generate and the financial return they earn. It is possible that the rhetoric

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<sup>14</sup> Johnson (2014).

used by impact funds is in response to these fiduciary investors' needs to appear uncompromising in their search for financial returns.

### *B1. Univariate Results*

To set the stage we present in the percent of investments by LP type for non-impact and impact investments in Figure 2. The pie charts present the composition of investors in the two fund types; the bar chart presents the difference in percent (impact less non-impact) for each LP type. For non-impact funds, pension funds (public and private) together comprise 42% of the investments. This ratio is in line with prior literature. Foundations and institutional asset managers (e.g., fund of funds) are also important sources of capital for non-impact funds, contributing 11.5% and 14% of total, respectively.

In contrast, development organizations and public pensions are by far the most important sources of capital for impact funds: the two types together provide over 53% of the total investments. While public pensions' share of the total is similar between the two fund types, development organizations invest far more in impact funds (28.3%) relative to their investments in non-impact funds (8.0%). The bar chart also shows that banks invest relatively more in impact funds, whereas foundations, endowments, institutional asset managers, and private pensions invest relatively less.

The univariate results for development organizations, banks, and private pensions are broadly consistent with our conjectures regarding the effects of their organizational missions and regulatory incentives on their propensity to invest in (or eschew) impact funds. Somewhat surprising are (1) the importance of public pensions as source of capital for impact funds, despite the fiduciary duty constraints that they face, and (2) the relative insignificance of foundations as source of capital, despite the fact that impact investing might help them achieve their organizational mission. For these LP types, we note the presence of tension between competing incentives, as described above, rendering the net effect ambiguous. It is also premature to draw inferences from univariate statistics alone, given the economic significance of other fund/LP attributes (such as prior relationships and geographic proximity) in determining fund choices. In the next section we further examine these differences across LP types in the multivariate logit model setting.

### *B2. Multivariate Results*

Table 5 presents the logit model results estimated separately for the 10 LP types. As before, an observation is a potential investment by an LP into a fund, and models (1) and (2) are the same specification as presented in Table 4 with the same set of independent variables. For ease of presentation only the key variables of interest are reported. As before, both the marginal effects and the scaled marginal effects (as a percent of the base investment rate for the LP type) are shown.

In Model (1), we find that the demand for impact is positive and significant for development organizations, foundations, banks, insurance, and public pensions. Since the base investment rates vary across LP types, it is important to scale the marginal effects by the type-specific investment rates in order to compare the economic magnitudes across LP types. We find that the effect of being an impact boosts the demand by between 10.6% and 23.7% of the base investment rates for these 5 LP types (with foundations being the lowest, and banks and insurance being the highest); thus, the effect is statistically significant and economically important. In contrast, the effect of being an impact fund reduces the demand by 31.4% for endowments.

We also find a significant positive demand effect for foundations, which was not evident in our simple univariate analysis. This result suggests that the multivariate environment absorbs important factors determining demand for any fund, so that we are able to identify the distinct effect of being an impact fund.

In Model (2), we explore whether the UNPRI designation enables us to identify heterogeneity among investors in their demand for impact funds even *within* a given LP type. In particular, when it comes to LP types with competing incentives such as foundations and private pensions, investors may bifurcate on their impact investment decisions, with some eschewing such investments because of the tax or other regulatory constraints they face, while others seeking impact fund investments and signing UNPRI to demonstrate alignments of their decisions with long-term interests of their beneficiaries. Model (2) addresses this possibility by separately estimating the effect of impact for UNPRI signers and non-signers for each LP type.

We find that the demand for impact is indeed much stronger among UNPRI signers than non-signers for foundations, institutional asset managers (e.g., fund of funds), private pensions and public pensions. Indeed, among foundations and private pensions, non-signers either are neutral towards impact (foundations) or actively eschew impact funds (private pensions), while signers are 42.7% and 26.5% likelier to invest in impact funds relative to the base investment rate, respectively. For development organizations, banks, and insurance companies, UNPRI is a comparatively weaker marker of investors' propensity to invest in impact.

To better understand the sources of these differences across and within LP types, we lay out various dimensions of LP attributes in Table 6. The first dimension is whether the constituents of the investor capital are organizations or households. Households may derive utility from externalities (either because they enjoy the externality of a thriving local economy, they desire environmental protection for the next generation, etc.) and demand social consideration in investment choices. Wealth managers and the two types of pensions serve households as the ultimate constituents. Next, we classify the LP types on whether the capital is intermediated by administrators or asset managers. When asset managers act as

intermediaries, some of them choose to cater to SRI-leaning clientele and sign the UNPRI in order to strengthen their brand. Similarly, administrators acting on behalf of constituents and investing in impact funds have incentives to sign the UNPRI in order to demonstrate fulfillment of their fiduciary duty. These distinctions help explain the higher demand for impact among UNPRI signers for private and public pensions, and for institutional asset managers. Indeed, though not statistically significant, we see similarly higher propensity to invest in impact among signers for wealth managers, another intermediary. In contrast, when investors directly invest their own capital, they do not have a branding motive to sign the UNPRI.

Next dimension classifies the investors on whether their primary goal is impact or financial. *Ceteris paribus*, we would expect those investors whose primary goal is impact generation to have stronger demand for impact, and our results corroborate this prediction. It is interesting that, among the investors whose primary goal is financial, endowments exhibit the strongest aversion to invest in impact funds. Moreover, none of the UNPRI signers among endowments invest in impact funds (and thus Model (2) is not estimated for endowments). Endowments, which are primarily North American institutions, are non-profit organizations with stated goals of preserving and growing the endowed funds (often for universities) for the purpose of supplementing the endowed organization's annual operating budget. Prior literature has documented that endowments enjoy superior returns from investments in VC funds relative to other investors, either because they have skill in selecting funds, have better access to top-performing funds, or both (Lerner, Schoar, and Wang; 2008). Unlike asset managers or pensions funds, they do not have clientele to cater to or constituents to satisfy. While they could be motivated to engage in CSR in order to generate goodwill in the local community, as a group they appear not to do so.

To summarize, development organizations, foundations, banks, insurance, and public pensions tilt towards impact funds, while endowments tilt away from them. Furthermore, when split on UNPRI designation, we find that asset managers and private pensions who are signers also have positive demand for impact (but not the non-signers). Public pensions, despite their being subject to strong fiduciary duty (at least in the U.S.), tilt towards impact funds, which suggests that the political pressure they face is perhaps stronger than the fiduciary duty constraint. In contrast, private pensions overall do not tilt towards impact funds, which is consistent with the ERISA being a major friction. For banks and insurance, both the regulatory incentives (in case of U.S. banks and CRA) and the CSR motives are possible sources of their demand for impact. Finally, foundations exhibit positive tilts towards impact funds but overall their share among impact funds is small. This finding is intriguing in light of the conjectured tension between the mission-based nature of foundations and the IRS restrictions on PRIs that may dis-incentivize them from making impact investments. In work in progress, we plan to unpack these various results by

interacting the Impact variable with LP regions (e.g., U.S. vs. non-U.S. for examining the effect of U.S. regulation), examining fund missions (e.g., local economy v. climate change), and foundation missions.

## IV. CONCLUSION

We study the determinants of limited partner (LP) investments in venture capital funds in general and impact funds in particular using LP and fund data for over 5,000 funds and over 3,500 investors. Based on our conjecture that VC investors are heterogenous in their latent demand for impact investments as well as the type of their constraints that potentially limit their exposure, we sort LPs into 10 types – public pensions, foundations, endowments, and the like – and examine the questions separately for each type.

We show that prior relationships and geographic proximity matter the most in explaining LP-fund matches. Other fund attributes – e.g., fund managers’ prior fund performance and fund industry focus – and LP attributes – e.g., prior experience in VC investments – explain relatively little. Importance of local bias suggests that investors’ interests in impact funds may interact with their overall regional tilts.

We find that being an impact fund generally has a positive effect on the choice probability that an investor invests in a given fund relative to (LP type-specific) baseline probabilities; the magnitude of this effect is significant and consistently large for development organizations, foundations, banks, insurance companies, and public pension funds. In contrast, endowments tilt away from impact funds.

We further examine whether UNPRI signatories, potentially a proxy for investors that desire impact, are more likely to invest in impact funds than non-signatories of the same LP type. We find that the demand for impact is stronger among UNPRI signers than non-signers for foundations, institutional asset managers, private pensions and public pensions. Indeed, among foundations and private pensions, non-signers either are neutral towards impact (foundations) or actively eschew impact funds (private pensions), while signers are 42.7% and 26.5% likelier to invest in impact funds relative to the base investment rate, respectively.

We discuss the likely sources of this investor heterogeneity in their demand for impact. LPs’ ultimate constituents (organization vs. households), presence of intermediation and agent-principal relationships (asset managers or administrators), primary objective of the LP entity (impact vs. financial return), and potential secondary incentive for impact (e.g., CSR, philanthropy) all potentially affect an LP’s tilts towards (or away from) impact investments, as well as their decision to sign the UNPRI. In work in progress, we plan to further investigate our conjectures regarding the importance of these sources of investor heterogeneities in determining their asset allocation decisions towards or away from impact, and the extent to which policy and regulatory changes may usher in greater supply of capital towards impact investments.



## Appendix A: Construction of Impact Fund Sample

We construct our dataset of impact funds as follows. We create a dataset of articles that mention the Preqin funds in the article text using Factiva (and particularly Private Equity Analyst, a leading trade publication with extensive reporting on PE fundraising). From the article dataset, we identify *potential* impact fund by performing a keyword search (see Table A1 for a list of keywords). We review these articles and delete illegitimate word hits (e.g., keywords referred not to the fund but to another entity discussed in the article). From this process, we identify 56 managers of impact funds (e.g., a keyword “mission investing” appears in the article and describes one of the funds managed by the manager). We consider all PE funds managed by these 56 managers as potential impact funds (“text56” sample).

We also identify potential impact funds using data from the organizations that compile lists of impact funds (ImpactBase and Preqin) or GPs with impact investments (ImpactAssets and Cambridge) or:

- (1) ImpactBase ([www.impactbase.org](http://www.impactbase.org)) is an online directory of impact investment vehicles. Fund managers can register their impact funds and investors can search the database to identify funds they may be interested in. We downloaded funds listed in ImpactBase as potential impact funds (“ibase” sample) as of 2014.
- (2) ImpactAssets ([www.impactassets.org](http://www.impactassets.org)) is a 501(c)3 organization affiliated with Calvert Foundation. ImpactAssets annually selects a list of 50 firms that engage in impact investments “to demonstrate a wide range of impact investing activities”. We downloaded the ImpactAssets manager lists for all years that are available from their website as of 2014 (“i50” sample).
- (3) Preqin ([www.preqin.com](http://www.preqin.com)) is a leading provider of data and intelligence for the alternative assets industry. Its fund database has a field called “fund ethos”, and GPs of funds have the option to report their fund as falling into one or more of the following 6 categories – “Economic Development”, “Environmentally Responsible”, “Microfinance”, “Sharia Compliant”, and “Socially Responsible”. We exclude “Sharia Compliant” but downloaded all funds that check at least one of the other five “fund ethos” categories as of 2014 (“ethos” sample).
- (4) Cambridge Associates ([www.cambridgeassociates.com](http://www.cambridgeassociates.com)) is a leading investment advisor to foundations, endowments, private wealth, and corporate and government entities. As part of their advisory service to their investor clients Cambridge compiles a list of mission-related investing managers (MRI Manager Database). We obtained the list of managers as of May 2013 (“Cambridge” sample). This list includes many very large GPs that do not specialize in impact investments (e.g., Blackstone).

At this stage, we cast our net broadly and consider all GPs with at least one impact investment. Specifically, we identify all funds managed by GPs that (a) manage an iBase fund, Preqin ethos fund, or text56 fund or (b) are listed as a GP with impact investments by ImpactAssets or Cambridge Associates. We identify countries with GDP per capital of less than \$1400 according to the IMF 2014 (see Table A2 for the list of 37 countries) and add 66 funds that make investments in these countries according to Preqin. For funds that invest in multiple regions, we require that half of the listed regions be in these poor countries. This results in 843 funds – far more than our final sample because we include *all* funds managed by GPs with impact funds, which includes some GPs with many funds but only a few are impact funds (e.g., Blackstone and Hamilton Lane).

For these 843 funds, we read detailed fund and/or GP descriptions from vendors (Capital IQ, Thomson One), PE firm websites, and the original source articles from Private Equity Analyst. Finally, we require that there is data on at least one LP per fund in Preqin. This process yields 161 impact funds with a venture or growth focus.

**Appendix Table A1: Impact Investment Search phrases**

base of the pyramid	greenhouse	social objectives
bottom of the pyramid	impact investing	social responsible
clean air	impoverished	socially conscious
clean water	indigenous	socially motivated
community invest	invest ethical	socially responsible
disadvantaged	investing ethical	socially-motivated
double bottom line	low carbon	SRI
dual bottom-line	low-carbon	sustainable agriculture
environmental impact	lower-carbon	sustainable development
environmental objective	minority community	sustainable economic development
environmentally clean	minority-owned	sustainable farming
environmentally conscious	missing middle	sustainable forestry
environmentally motivated	mission driven	sustainable investment
environmentally sustainable	mission investing	sustainable property
ethical invest	mission related	sustainable water
ethical objectives	mission-driven	tribe
ethically conscious	mission-related	triple bottom line
ethically motivated	poverty	triple bottom-line
ethically-conscious	S.R.I.	women owned
ethically-motivated	social finance	women-owned
green energy	social good	
green focused	social impact	

**Table A2: Countries with GDP Per Capital less than \$1400**

Country	GDP per capita	Country	GDP per capita	Country	GDP per capita
Pakistan	1,343	Haiti	833	Guinea-Bissau	589
Kyrgyzstan	1,299	Benin	822	North Korea	583
Chad	1,236	Sierra Leone	808	Ethiopia	575
Burma	1,221	Mali	754	Guinea	573
Bangladesh	1,172	Uganda	726	Liberia	484
Lesotho	1,130	Rwanda	722	Niger	469
South Sudan	1,127	Burkina Faso	717	Madagascar	449
Tajikistan	1,113	Nepal	699	Congo	437
Cambodia	1,081	Togo	658	Gambia	428
Senegal	1,072	Afghanistan	649	Central African Republic	380
Zimbabwe	1,031	Mozambique	630	Burundi	336
Tanzania	1,006	Eritrea	590	Malawi	242
Comoros	923				

Source: IMF World Economic Outlook 2014

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**Table 1: Limited Partner (LP) Descriptive Statistics**

For each of the LP types and all LPs, we present descriptive statistics by first averaging all observations for a unique LP and then calculating the mean (standard deviation) for each variable across N LPs. Funds per LP are the total number of unique fund investments by an LP. Vintage Year is the average vintage year of fund investments. Years of Experience is the number of years since the LPs first fund commitment. In Panel B, we present the regional distribution of LPs by LP type.

	Dev. Org.	Foundation	Bank	Insurance	Endowment	Corp. & Gov't	Institutional	Wealth Manager	Private Pension	Public Pension	Total
Panel A: LP Descriptive Statistics											
Number of LPs	272	464	261	326	201	417	528	203	447	385	3,504
% of Total	7.8	13.2	7.4	9.3	5.7	11.9	15.1	5.8	12.8	11.0	100.0
No. of Capital Commitments	2,214	2,893	670	1,936	1,357	1,549	3,519	701	4,178	6,418	25,435
% of Total	8.7	11.4	2.6	7.6	5.3	6.1	13.8	2.8	16.4	25.2	100.0
Funds per LP	8.14	6.23	2.57	5.94	6.75	3.71	6.66	3.45	9.35	16.67	7.26
	(16.90)	(14.17)	(2.69)	(12.41)	(16.84)	(16.43)	(16.22)	(6.26)	(21.67)	(33.04)	(18.64)
Vintage Year	2006.93	2005.44	2006.07	2004.79	2004.44	2006.46	2005.24	2005.77	2004.10	2004.38	2005.30
	(4.30)	(4.15)	(4.32)	(5.01)	(4.62)	(5.24)	(4.62)	(5.15)	(4.72)	(5.10)	(4.81)
Years of Experience	4.12	3.92	2.89	4.10	4.35	2.56	3.59	3.16	4.70	6.90	4.07
	(4.12)	(4.24)	(2.88)	(4.71)	(5.00)	(3.08)	(4.13)	(3.85)	(4.63)	(6.57)	(4.60)
No. UNPRI Signatories	14	11	21	45	3	4	103	25	37	52	315
% UNPRI Signatories	5.1	2.4	8.0	13.8	1.5	1.0	19.5	12.3	8.3	13.5	9.0
Panel B: Regional Distribution of LPs by LP Type											
North America	18.8	82.5	14.9	49.4	82.6	23.3	29.9	34.0	72.5	60.0	47.9
Developed Europe	28.7	14.9	39.5	33.1	15.4	27.3	41.7	38.4	20.1	30.9	28.8
Emerging Europe	5.9	0.2	3.4	0.3	0.0	1.2	0.9	2.0	0.7	0.3	1.3
Africa	4.8	0.4	3.8	2.5	0.5	0.7	2.5	0.5	0.7	1.8	1.7
Central and South America	5.9	0.4	1.1	1.2	0.5	1.9	0.6	0.5	2.7	1.6	1.6
Developed Asia	7.7	0.6	15.3	5.5	0.0	19.4	8.9	17.7	2.0	3.4	7.6
Emerging Asia	25.0	0.2	14.9	6.4	1.0	23.7	11.0	3.4	0.0	1.3	8.6
Middle East	3.3	0.6	6.9	1.5	0.0	2.4	4.5	3.4	1.3	0.8	2.4

Standard deviations in parentheses.

**Table 2: Fund Descriptive Statistics**

This table presents fund summary statistics for all funds (left columns) and impact funds (right columns). First-time fund and missing performance data are dummy variables that equal one if this is the fund family's first fund or if there is no historic performance data. Past fund percentile rank is a weighted average of past percentile ranks for funds managed by the same fund family relative to vintage year cohort funds. Past fund excess IRR is a weighted average and demeaned performance measure for prior funds managed by the same fund family. In Panel B, we present the geography focus of fund investments where each region represents a dummy variable that equals one if the fund invests in the region. In Panel C, we present the industry focus of fund investments. Funds can have multiple geography and industry focuses.

	All Funds			Impact Funds		
	N	Mean	SD	N	Mean	SD
Panel A: Descriptive Statistics						
Vintage Year	5053	2004.21	6.55	161	2006.51	4.77
Fund Size (\$mil)	4431	194.11	290.26	149	127.98	146.91
Past Fund Excess IRR	1631	3.7	12.73	56	-0.68	10.38
Past Fund Percentile Rank	1786	0.52	0.25	68	0.42	0.27
First-time Fund	5053	0.34		161	0.38	
Missing Performance Data	5053	0.30		161	0.20	
Panel B: Geography Focus of Fund Investments						
North America	5053	0.51		161	0.34	
Developed Europe	5053	0.23		161	0.17	
Emerging Europe	5053	0.06		161	0.09	
Africa	5053	0.03		161	0.23	
Central and South America	5053	0.03		161	0.12	
Developed Asia	5053	0.07		161	0.01	
Emerging Asia	5053	0.16		161	0.14	
Middle East	5053	0.03		161	0.00	
All Regions	5053	1.12		125	1.10	
Panel C: Industry Focus of Fund Investments						
Business Services	5053	0.03		161	0.03	
Energy	5053	0.06		161	0.19	
Consumer Discretionary	5053	0.05		161	0.03	
Diversified	5053	0.29		161	0.49	
Industrials	5053	0.04		161	0.06	
Information Technology	5053	0.44		161	0.06	
Health Care	5053	0.22		161	0.06	
Infrastructure	5053	0.01		161	0.05	
Food and Agriculture	5053	0.01		161	0.04	
Materials	5053	0.01		161	0.04	
Real Estate	5053	0.00		161	0.04	
Media and Communications	5053	0.12		161	0.03	
All Industries	5053	1.28		125	1.12	

**Table 3: LP Capital Commitment Descriptive Statistics**

This table presents summary statistics on LP capital commitments to PE funds. In Panel A, we present the number of investments by LP type (columns) and region (rows). In Panel B, we present the percent of investments where the LP and the GP are in the same region (GEOMATCH=1) by LP type and LP region. In Panel C, we present the percent of investments where the LP invested in a prior fund managed by the same GP (RELATION=1) by LP type.

	Dev. Org.	Foundation	Bank	Insurance	Endowment	Corp. & Gov't	Institutional	Wealth Manager	Private Pension	Public Pension	Total
<b>Panel A: Number of LP Capital Commitments</b>											
North America	666	2,687	112	1,365	1,283	308	1,375	273	3,607	5,414	17,090
Europe	897	183	272	396	64	774	1,687	193	477	883	5,826
Developed Asia	154	5	91	32	-	184	205	180	10	39	900
Emerging Asia	196	8	28	22	2	27	49	20	36	49	437
Rest of World	301	10	167	121	8	256	203	35	48	33	1,182
TOTAL	2,214	2,893	670	1,936	1,357	1,549	3,519	701	4,178	6,418	25,435
<b>Panel B: % Capital Commitments where LP and Fund are in the same Region (GEOMATCH=1)</b>											
North America	64.3	78.7	85.7	83.1	81.4	67.2	74.0	83.9	82.6	87.4	81.8
Europe	39.2	67.8	83.1	80.3	90.6	76.7	50.7	60.6	44.4	67.5	59.3
Developed Asia	86.4	100.0	74.7	71.9	-	56.5	49.8	65.6	50.0	87.2	65.8
Emerging Asia	86.7	100.0	92.9	100.0	100.0	92.6	71.4	25.0	91.7	65.3	81.9
Rest of World	74.1	90.0	80.2	81.8	100.0	71.9	69.5	37.1	77.1	81.8	74.0
TOTAL	59.0	78.2	82.1	82.4	81.9	71.9	61.1	68.8	78.2	84.4	75.7
<b>Panel C: % Capital Commitments where LP and Fund Family have prior Relationship (RELATION=1)</b>											
Prior Relationship	23.5	41.8	10.9	26.8	38.8	22.9	25.5	24.1	38.5	41.3	33.5



**Table 4: The Demand for Impact**

The table presents marginal effects from a fixed effects logit model; the dependent variable is a dummy variable that equals one if an LP invests in a fund. Observations are determined by crossing all vintage year funds with LPs that make an investment in that year. Impact and UNPRI dummy variables equal one for impact funds and UNPRI signatories, respectively. Model (1) presents results with Impact only; model (2) interacts Impact and UNPRI. Fund attributes include performance ranks for past funds managed by the fund family, expected fund size, and dummy variables for funds missing performance data and first time funds. LP attributes include log of years since first fund investment. Relationship is a dummy variable that equals one if the LP invested in a prior fund managed by the same fund family. Fund-LP geography match are five dummy variables for five regions that equal one if the fund and LP are in the same region. Fund geography (industry) consists of five (12) dummy variables that equal one if the fund invests primarily in that region (industry). We include vintage year fixed effects and LP investments per year fixed effects (see text for details). The Tjur R2 is the difference in the mean of the predicted probability for the two categories of the dependent variable (i.e., invested v. non-invested funds). The Tjur partial R2 is calculated as the improvement in the Tjur R2 from adding the indicated variables to the baseline model.

Variable Group	Variable	Model		Tjur Partial R2 % Change in R2
		(1)	(2)	
Impact Variables	Impact	0.00111***		
	Standard Error	[0.000152]		
	Scaled Marginal Effect	13.5%		
	Nonsigner*Impact		0.000554***	
	Standard Error		[0.000176]	
	Scaled Marginal Effect		7.1%	.00016
	UNPRI*Impact		0.00291***	0.10%
	Standard Error		[0.000276]	
	Scaled Marginal Effect		25.3%	
	UNPRI		0.000222***	
	Standard Error		[7.89e-05]	
	Scaled Marginal Effect		2.7%	
Fund Attributes	Past Fund Percentile Rank	0.000947***	0.000942***	
		[0.000156]	[0.000155]	
	Missing Performance Dummy	-0.000405***	-0.000407***	
		[0.000107]	[0.000107]	-0.00035
	First Fund Dummy	-0.000533***	-0.000534***	-0.22%
		[0.000107]	[0.000107]	
	Expected Fund Size	0.000674***	0.000670***	
		[0.000208]	[0.000208]	
LP Attributes	Years in PE Investing	-0.000271***	-0.000280***	0.00020
		[3.82e-05]	[3.82e-05]	0.13%
Relationship	Relation Dummy	0.0157***	0.0157***	0.13399
		[0.000160]	[0.000160]	84.83%
Fund-LP Geography Match	North America	0.00520***	0.00523***	
		[9.77e-05]	[9.81e-05]	
	Europe	0.00718***	0.00713***	
		[0.000116]	[0.000116]	
	Developed Asia	0.0117***	0.0116***	0.01015
		[0.000238]	[0.000238]	6.43%
	Rest of World	0.0109***	0.0108***	
		[0.000255]	[0.000254]	
	Emerging Asia	0.00779***	0.00781***	
		[0.000166]	[0.000166]	

Variable Group	Variable	Model		Tjur Partial R2 % Change in R2
		(1)	(2)	
Fund Geography	North America	-0.00243*** [0.000205]	-0.00244*** [0.000205]	
	Europe	-0.00147*** [0.000100]	-0.00146*** [1.00e-04]	
	Developed Asia	-0.00158*** [0.000157]	-0.00158*** [0.000156]	0.00012 0.08%
	Rest of World	-0.000379*** [0.000114]	-0.000377*** [0.000114]	
	Emerging Asia	4.07E-05 [9.81e-05]	4.09E-05 [9.79e-05]	
	Business Services	0.000957*** [0.000149]	0.000955*** [0.000149]	
Fund Industry	Energy	0.000194 [0.000120]	0.000184 [0.000120]	
	Consumer	0.000327*** [0.000126]	0.000326*** [0.000126]	
	Diversified	-0.000405*** [9.34e-05]	-0.000405*** [9.33e-05]	
	Industrials	-0.000273* [0.000158]	-0.000268* [0.000158]	
	IT	-1.94E-05 [7.28e-05]	-2.05E-05 [7.27e-05]	0.00034 0.21%
	Health Care	0.000147** [7.42e-05]	0.000145** [7.41e-05]	
	Infrastructure	0.000829*** [0.000231]	0.000818*** [0.000231]	
	Food & Agriculture	3.65E-05 [0.000296]	3.36E-05 [0.000296]	
	Materials	-0.00119*** [0.000453]	-0.00114** [0.000452]	
	Real Estate	0.00122** [0.000488]	0.00124** [0.000489]	
	Media and Communications	-9.88E-05 [8.01e-05]	-9.88E-05 [8.00e-05]	
Vintage Year Fixed Effects	Yes	Yes	0.0017 1.110%	
LP Investment Rate Fixed Effects	Yes	Yes	0.00696 4.41%	
Observations	3,089,112	3,089,112		
Tjur R2	0.1579	0.1580		

Standard errors in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: The Demand for Impact by LP Type and UN PRI Signatory**

This table presents the estimation results of our main logit model by LP Type. Observations include potential PE investments by an LP in a fund, which are determined by crossing all vintage year funds with LPs that make an investment in the same vintage year. The dependent variable is a dummy variable that takes a value of one if an LP invests in a fund. The table presents marginal effects from a fixed effects logit model. Scaled effects divide marginal effects by baseline investment rates. Impact and UNPRI are dummy variables that take a value of one for impact funds and UNPRI signatories, respectively. Model (1) presents results with impact as the key independent variable, while model (2) interacts Impact and UNPRI. Controls include all variables from the main logit model presented in Table 4.

Variable	Development Organizations		Foundations		Banks		Insurance		Endowments	
	Model: (1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<b>Impact</b>										
Coefficient	0.00148***		0.000772*		0.00104***		0.00169***		-0.00227**	
Standard error	[0.000216]		[0.000433]		[0.000249]		[0.000426]		[0.000916]	
Scaled Marginal Effect	18.4%		10.6%		22.9%		23.7%		-31.4%	
<b>Nonsigner_impact</b>										
Coefficient		0.00123***		0.0005		0.000949***		0.00163***		n/a
Standard error		[0.000241]		[0.000454]		[0.000264]		[0.000455]		
Scaled Marginal Effect		17.5%		6.9%		21.1%		22.3%		
<b>UNPRI_impact</b>										
Coefficient		0.00214***		0.00466***		0.00166***		0.00203*		n/a
Standard error		[0.000391]		[0.00127]		[0.000597]		[0.00104]		
Scaled Marginal Effect		14.0%		42.7%		34.3%		32.8%		
<b>UNPRI</b>										
Coefficient		0.000927***		-0.000042		0.0000004		-0.000345		
Standard error		[0.000175]		[0.000379]		[0.000199]		[0.000252]		
Scaled Marginal Effect		6.1%		-0.4%		0.0%		-5.6%		
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vintage Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LP Inv't Rate Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	274,839	274,839	395,606	395,606	147,497	147,497	271,168	271,168	187,812	

Standard errors in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: (continued)**

This table presents the estimation results of our main logit model by LP Type. Observations include potential PE investments by an LP in a fund, which are determined by crossing all vintage year funds with LPs that make an investment in the same vintage year. The dependent variable is a dummy variable that takes a value of one if an LP invests in a fund. The table presents marginal effects from a fixed effects logit model. Scaled effects divide marginal effects by baseline investment rates. Impact and UNPRI are dummy variables that take a value of one for impact funds and UNPRI signatories, respectively. Model (1) presents results with impact as the key independent variable, while model (2) interacts Impact and UNPRI. Controls include all variables from the main logit model presented in Table 4.

Variable	Corporate & Government Portfolios		Institutional Asset Managers		Wealth Managers		Private Pensions		Public Pensions	
	Model: (1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<b>Impact</b>										
Coefficient	-0.000234		0.000279		0.000107		-0.000832		0.00182***	
Standard error	[0.000501]		[0.000512]		[0.000644]		[0.000588]		[0.000354]	
Scaled Marginal Effect	-3.5%		3.5%		1.9%		-9.0%		15.8%	
<b>Nonsigner_impact</b>										
Coefficient		-0.00039		-0.000735		2.88E-05		-0.00188***		0.000938**
Standard error		[0.000534]		[0.000710]		[0.000698]		[0.000704]		[0.000430]
Scaled Marginal Effect		-6.1%		-10.5%		0.5%		-20.6%		9.1%
<b>UNPRI_impact</b>										
Coefficient		0.00119		0.00154**		0.000448		0.00275***		0.00368***
Standard error		[0.00140]		[0.000708]		[0.000320]		[0.00102]		[0.000537]
Scaled Marginal Effect		6.5%		15.5%		7.9%		26.5%		22.3%
<b>UNPRI</b>										
Coefficient		-0.000497		0.000139		0.000448		0.000399		0.000151
Standard error		[0.000450]		[0.000172]		[0.000320]		[0.000257]		[0.000148]
Scaled Marginal Effect		-2.7%		1.4%		7.9%		3.8%		0.9%
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vintage Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LP Inv't Rate Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	228,724	228,724	445,153	445,153	126,202	126,202	452,592	452,592	557,650	557,650

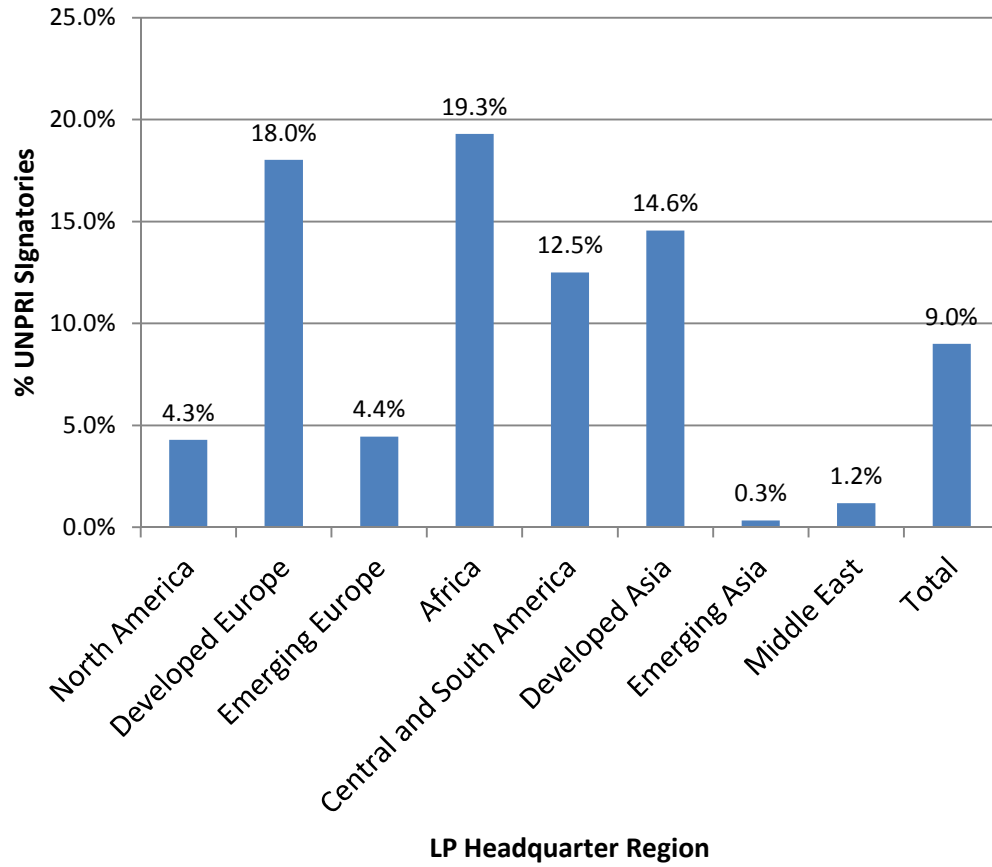
Standard errors in brackets

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

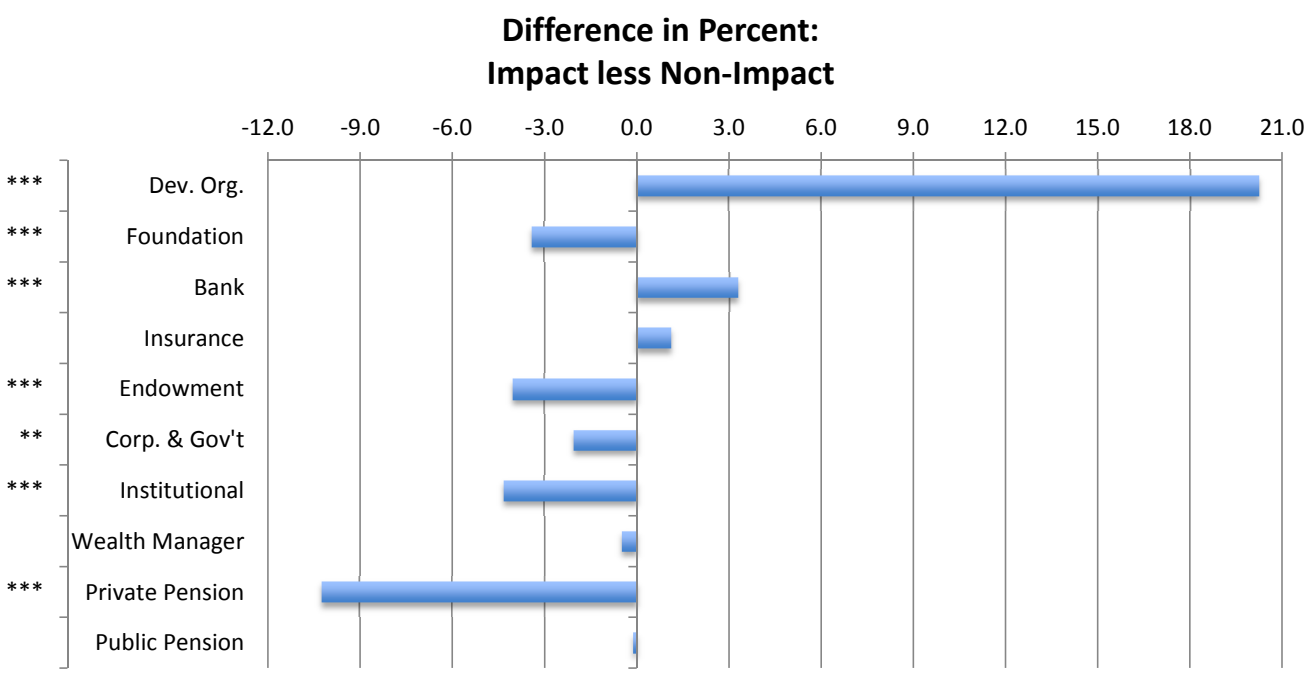
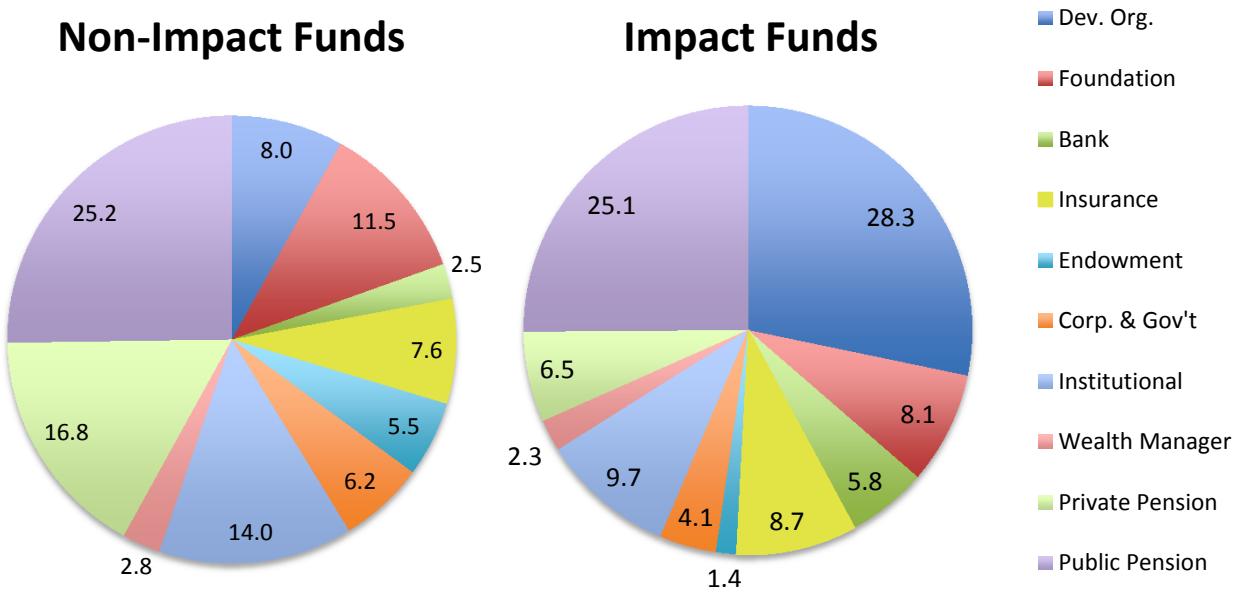
**Table 6: LP Attributes to Understand Impact Motives**

The table lays out attributes of the LP investor types listed in the first column. Column 2 indicates whether the constituents of the capital are organizations or households. Column 3 indicates whether the capital is directly invested by the constituents themselves or intermediated by either administrators (e.g., foundations and pensions) or asset managers. Column 4 indicates whether the primary goal of constituents is financial return maximization or impact generation. Column 5 indicates potential impact goals for financial investors. Finally, column 6 indicates whether the LP is subject to restrictions impeding any motives to direct capital to impact investments.

Limited Partner	Constituent	Intermediated	Primary Goal	Potential Impact Goal	Restrictions against Impact Investment
Development Organizations	Organization	no	Impact		--
Foundations	Organization	no	Impact		--
Banks	Organization	no	Financial	CSR <sub>politicized</sub>	Bank regulation, shareholder fiduciary
Insurance	Organization	no	Financial	CSR <sub>politicized</sub>	Insurance regulation, shareholder fiduciary
Endowments	Organization	no	Financial	CSR	University charters
Corporate & Government Portfolios	Organization	no	Financial	CSR	Shareholder fiduciary
Institutional Asset Managers	Organization	yes (asset managers)	Financial		Fiduciary
Wealth Managers	Household	yes (asset managers)	Financial	philanthropy	--
Private Pensions	Household	yes (corporation as administrator)	Financial	philanthropy, CSR	Shareholder fiduciary, ERISA (U.S.); pension fiduciary
Public Pensions	Household	yes (government as administrator)	Financial	philanthropy, CSR <sub>politicized</sub>	State/national law; pension fiduciary
Potential Determinants					
		(1) Is an intermediary creating distance from constituent to investment?	(2) Is the primary goal of constituents financial or impact?	(3) Is household philanthropy an objective? (4) Is organizational social responsibility ("CSR") an objective? (5) Is CSR politicized by law or voting?	(6) Do any restrictions on impact investing come from charters or laws?



**Figure 1: Percent of LPs that are UNPRI Signatories by Region**



**Figure 2: Percent of LP Investments in Impact and Non-Impact Funds**  
 The figure presents the percent of investments by LP type separately for non-impact investments (left pie) and impact investments (right pie). The bar chart presents the difference in the percentage (impact less non-impact).  
 \*\*\*, \*\*, \* - significant at the 1, 5, and 10% level (respectively).