Impact Investing*

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Abstract

We study investments in impact funds, defined as venture or growth equity funds with dual objectives of generating financial returns and positive externalities. Being an impact fund elevates a fund's marginal investment rate by 14.1% relative to a traditional VC fund, even more for funds focused on environmental, poverty, and minority/women issues. Europeans and UNPRI signatories have sharply higher demand for impact. Three investor attributes – household-backed capital, mission-oriented investors, and investors facing political/regulatory pressure to invest in impact – account for the higher impact demand. In contrast, legal restrictions against impact (e.g., ERISA) hinder 25% of total demand.

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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 April 2016, 1500 organizations representing $62 trillion in asset under management are signatories to the United Nations Principles of Responsible Investment (UNPRI), vowing to embed responsibility into their organizational and/or investment decisions. The massive response to the UNPRI suggests the existence of 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, very little private capital is deployed with the intent of generating social impact. As reported in World Economic Forum (2014), the latest estimates from the Global Sustainable Investment Alliance put socially responsible investment at $13.6 trillion. However, it is generally thought that a small slice of this investment actually goes toward assets with dual objectives to achieve impact and generate a financial return.

Our agenda is to shed light on whether this inaction is due to a lack of demand for impact by households and organizations, the limited range of financial instruments, and/or the rules governing investment practices. We do so by analyzing the demand for impact funds. Impact funds are venture capital and growth equity funds with dual objectives of generating a financial return and generating a positive externality (e.g., the alleviation of poverty or the reduction of greenhouse gas emissions). Impact funds are typical private equity vehicles with a fund life of at least ten years. Fund managers make equity investments in a portfolio of startup/private companies that are aligned with the fund's objectives. Just as in traditional venture capital funds, investors earn financial returns on impact funds by receiving exit proceeds from the fund manager when/if these investments are exited. In addition, impact funds strive to generate social or environment impact via the portfolio companies' business activities.

Impact funds are distinct from investing in social enterprises (directly or via philanthropic funds) in that impact funds intend to earn financial returns in addition to addressing a social and/or environmental concern. Impact funds also stand in contrast to the long-standing tradition of SRI negative screening in public equities, where investors divest of stock in companies that engage in objectionable practices (e.g., divesting fossil fuel or tobacco). Likewise impact funds stand in contrast to SRI positive investments, which are financially-motivated investments targeting sectors, geographies or companies with the expectation of capitalizing on a competitive advantage or an underpricing related to an environmental, social, or governance factor.

Some argue that impact investors can "do well by doing good" and dismiss the tension between financial returns and the generation of positive externalities. This is a difficult argument for economic models. Impact investors' dual objective implies that they face a constrained investment opportunity set relative to financial investors, who have a sole objective of generating financial return and an unfettered choice of investments. It follows that financial investors will have better expected returns (properly risk-adjusted) than impact investors in an efficient market. Thus, the academic consideration of "doing well by doing good" requires that an investor is exploiting an opportunity out of equilibrium (e.g., a transitory advantage or an underpriced investment). Our objective is not to provide evidence for or against the "doing well by doing good" literature. Rather in our definition of impact investment, impact is a motivation in and of itself and is not motivated by existence of a financial opportunity.

To gauge the demand for impact, we manually construct a sample of 161 impact funds launched over the period 1989-2014 using a strict criterion that the fund must state dual objectives in its motivation. We hand code the type of impact each fund aims to achieve (environmental, poverty alleviation, etc.). We merge these data with a Preqin dataset containing more than 25,000 investments by more than 3,500 investors (which we call limited partners or LPs) to more than 5,000 traditional VC and impact funds. LPs are not all alike in their portfolio choice decisions; thus we manually look up the ultimate source of capital for each of the 3,500 LPs, coding them into ten LP types.

We use these data to study the underlying sources of demand for and impediments against impact investing. In particular, we model the representative investor's fund-choice problem in a binary choice setup in which an LP chooses whether or not to invest in each fund that is fundraising during a vintage year. The model includes a dynamic version of LP fixed effects as well as relationship variables between each LP-fund pair. Consistent with multi-dimensional product choice models, we allow the LP's fund choice to vary with a rich array of fund characteristics (e.g., vintage, size, manager quality, geography focus, and industry focus). By doing so, we isolate the representative LP's investment rate into impact funds relative to his/her investment rate into traditional VC funds, over and above the effects of all other factors on the LP's fund choice. This investment rate model first allows us to answer the question of

whether the supply of impact investment opportunities is keeping up with investor demand for impact, using the traditional VC market as an equilibrium benchmark. This analysis yields two baseline results.

First, we find that the representative LP exhibits a 14.1% higher investment rate into impact funds than it does into traditional VC funds. Specifically, an investor invests in 0.82 out of every 100 (or 1 out of 122) traditional funds offered in the vintage year, yet invests in 0.94 out of every 100 (or 1 out of 106) impact funds. Given the costliness of fundraising and covenants against premature fundraising, it is reasonable to assume in the VC institutional setting that the supply of *how many* funds are available in the market cannot react immediately to a shift in LP demand. Thus, our first evidence suggests that either the supply of impact funds is comparatively scarce or the realized impact demand has outpaced prospective fund managers' expectation during our sample period.

Second, we find that the desirability of impact differs by the impact focus. Impact funds focused on environmental impact, poverty alleviation, women and minorities, and social concerns generate greater investment rates than other impact funds. In contrast, impact funds focused on small and medium-sized enterprises (SMEs), social infrastructure (e.g. health, education, and mainstream infrastructure), and other geographic-focused funds do not generate investment rates that reliably differ from those of traditional VC funds.

Having inferred differential demand for impact from the representative LP's investment rate model, we next explore whether the magnitude of this effect varies across different LPs or LP characteristics and report three additional findings.

Third, we use three plausible markers of demand for externalities (UNPRI signatory status, European investors, and the post-2007 investment period) to test the validity of our baseline estimate and find that the magnitude of the demand for impact varies as predicted. Specifically, we find that the investment rate differential between impact funds and traditional VC funds is three times as large for UNPRI signatories (v. non-signatories), for European investors (v. North American investors), and for investments made after 2007 (v. pre-2007).

Fourth, we document that the source of capital (i.e., type of LP) materially affects demand for impact. We find elevated investment rates into impact funds for development organizations (17.7% increase relative to traditional VC investment rate), foundations (11.1% increase), banks (22.2% increase), insurance companies (24.0% increase), and public pensions (17.3% increase). By contrast, some investors eschew impact funds, including endowments (31.1% decrease in investment rate) and (with less precision) private pensions and corporate/government portfolios.

Finally, we build upon all of our prior analyses to test for sources of and restrictions against demand for impact. To gain more confidence on the causal nature of the correlation between the LP type (and characteristics) and the impact demand, we identify attributes defined at the LP type-geography level

that may account for increased or decreased demand for impact. The dynamic (i.e., time-varying) LP fixed effects fully absorb the LP type, and we exploit linear combinations of LP type *and* location (e.g., U.S. v. non-US) to identify separate effects of the attributes on the demand for impact. The six investor attributes that we examine include whether the capital is (1) held by households (as opposed to an organization), (2) intermediated by an asset manager, (3) held by an organization with a mission objective, (4) held by an organization with pressure to invest with impact, (5) held by an organization subject to laws restricting impact, or (6) held by an organization (e.g., corporation) with charters that restrict investments with impact.

We find evidence that households (rather than organizations), mission-focused investors, and organizations that face political or regulatory pressure to invest in impact exhibit higher impact investment rates, ceteris paribus. Legal restrictions against investments for non-financial motives (e.g., ERISA and UPMIFA) materially decrease the investment rates in impact funds. In contrast, organizational charters that require a focus on financial returns (e.g., corporate charters that require shareholder wealth maximization) do not seem to hinder demand. We further find that the households' and pressured investors' demand for impact is concentrated in local investments, as predicted. These results are consistent with the view that changing the rules that govern private capital investment could induce additional demand for investments that generate positive externalities. For example, our analysis suggests that if legal restrictions were not an impediment, there would be over 25% more impact investments. Extrapolating our results on impact funds to the overall market for sustainably and responsibly managed assets, it is possible that reducing legal impediments faced by many investor types could increase private capital tilted towards generating public goods by as much as $3.4 trillion (25% of $13.6 trillion).

There is little prior academic work on impact investing directly. Kovner and Lerner (2015) study 28 community development venture capital funds in the U.S., finding that these funds tend to invest in companies at an earlier stage, in industries outside the VC mainstream, and with fewer successful exits. Chowdry, Davies, and Waters (2016) develop a theoretical model of how social impact bonds (SIBs) can solve under or over-investment in social goods for heterogeneous pools of investors.

Our work relates to the broader literature on socially responsible investing (SRI) that dates back as far as Milton Friedman's 1970 doctrine on responsible investing.[1] 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

[1] "The Social Responsibility of Business is to Increase Its Profits," The New York Times Magazine, September 13, 1970. Also see Geczy et al. (2003).

performance, Benson and Humphrey (2008), Renneboog, Ter Horst, and Zhang (2011) 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. One strand of the SRI literature argues the non-pecuniary interests of investors affect the expected returns of investors; stocks preferred for nonfinancial reasons earn lower returns than spurned stocks. Building on this idea, Hong and Kacpercyzk (2009) find that stocks subject to widespread negative investment screens earn strong returns. Similarly, Chava (2014) concludes investors demand higher expected returns when investing in the stocks of firms excluded by environmental screens, while these firms also pay higher interest rates on bank loans. Riedl and Smeets (2016) find that social preferences and social signaling affect retail investors' choice of mutual funds, while financial decisions play a somewhat limited role. Bialkowski and Starks (2016) document that demand for SRI mutual funds has grown faster than traditional mutual funds in recent years, fueled by investors' nonfinancial considerations. All of the above studies highlight the potential importance of non-pecuniary motives when investing, which dovetails with our analysis of the demand for impact investments.[2,3]

Our paper also relates to a strand of the private equity literature that focuses on understanding demand. For example, Lerner, Schoar and Wongsunwai (2007) and Sensoy, Wang and Weisbach (2014) compare returns earned by different types of LPs. An implicit assumption in this literature is that all LPs want to maximize financial returns but have different fund-picking skill or lack access to the best funds. 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. We also relate to this literature by comparing economic magnitudes of various determinants of investor demand for VC. In particular, we find that two variables emerge as the primary drivers of fund choice – the prior investment relationship between the LP and the VC firm and the geographic proximity between the LP and the VC firm. While prior studies identify relationship and geography as significant determinants of investor demand (e.g., Lerner, Schoar and Wongsunwai (2007); Hochberg, Ljungqvist, and Vissing-Jørgensen (2014); Hochberg and Rauh (2013)), our results highlight that the economic significance of these variables is enormous compared to a myriad of other fund and LP characteristics. For example, the partial R^2 of the prior relationship variable accounts

[2] In a separate strand of the SRI literature, scholars investigate a type of agency conflict, where firm managers overinvest in pet social projects to the detriment of shareholders (e.g., DiGiuli and Kostovetsky (2014), Cheng et al. (2013), Fisher-Vanden and Thorburn (2011)). This literature is less relevant in the VC setting that we analyze, since the impact investments made by impact funds are consistent with both the fund objective and investors' objective to generate positive externalities through the deployment of private capital.

[3] Dimson et al. (2015) provides contrary evidence that investor engagement with the management of publicly traded firms on a collection of environmental, social, and governance issues is associated with positive abnormal returns.

for 85% of all explained variation in fund choice, while the geographic proximity variable accounts for the majority of the remaining explained variation.

I. METHOD

Our methodology focuses on a representative LP's investment rate into impact funds relative to his/her investment rate into traditional VC funds. The investment rate setup serves two agenda. First, the model examines the role of the financial sector in facilitating private capital flowing for impact purposes and answers the question of whether the supply of impact investment opportunities is keeping up with investor demand for impact by using the traditional VC market as an equilibrium benchmark. Second, we use the differential demand for impact funds as a yardstick and, combined with the simple observation that some investors must be the source of the demand for impact funds, explore who (i.e., which investors) account for the demand and why.

A. Investment Rate Model

Ideally, one might study capital commitments (in dollars) demanded relative to fund opportunities supplied for impact funds and traditional VC funds. However, data on the dollar value of capital commitments into VC funds by each investor is sparsely filled in most VC databases, and observability could be correlated with the type of fund and/or investors. Observability is a much less serious problem when instead focusing just on the incidence of investments. The other problem with studying dollar commitments is that the supply of fund opportunities in dollars (i.e., fund sizes) are endogenous, with fund managers adjusting fund size dynamically once they commence fundraising in response to demand. In contrast, it is reasonable to assume in the VC institutional setting that the supply of how many funds are available in the market cannot react immediately to a shift in LP demand.[4] Here again, by studying the incidence rather than size of investments, we are mostly remote from this supply endogeneity.

Thus, instead of studying dollar demand, we study the investment rate of a representative LP investing into traditional VC funds and impact funds. An investment rate of 0.01 implies that the representative LP invests in 1 out of every 100 funds that are fundraising that year. The underlying empirics might be that 300 funds choose to raise capital, and investors on average have demand for 3 investments per investor.

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[4] Fundraising is a time-consuming and very costly activity (taking 4 to 6 quarters from the initial announcement to closing) for VC fund managers and they typically raise new funds only once every 3 to 6 years (Barber and Yasuda (forthcoming)). In many cases they are even contractually obligated not to raise new funds until the current funds are nearly fully invested. VC funds are closed-end with limited secondary trading due to illiquidity of underlying assets, implying that investments are possible only at the time of fund inception for most LPs. Thus, our estimates should not suffer from identification issues of supply and demand in the sense of the industrial organization empirical literature.

To model investment rates, the dependent variable of interest is a binary choice variable $Invest_{ijt}$, which takes a value of one if investor *i*, who is active in the VC market in year *t*, invests in fund *j* of vintage year *t*. Note that we construct this variable with observations not just for the LP investments that are made ($Invest_{ijt} = 1$), but also for the investment possibilities that were not made ($Invest_{ijt} = 0$), thus making a "long" choice dataset akin to Ljungqvist et al. (2006) and Bottazzi et al. (2015). Using a logit model, we estimate the probability of an LP investing in any VC fund raising capital in the vintage year. Averaged across investors and time, this probability of investing is the investment rate. Our estimation model is:

$$\begin{aligned} Logit\left(Invest_{ijt}\right) = {} & \mu_{it}^{groupedLPs} + LPCharacteristics_{it}\Gamma + MatchCharacteristics_{ijt}\Phi \\ & + \beta IMPACT_j + FundCharacteristics_j\Psi + \mu_j^{vintageyear} + \mu_j^{region} + \mu_j^{industry} + \varepsilon_{ijt} \end{aligned} . \quad (1)$$

The key variable is $IMPACT_j$, an indicator that takes a value of one for funds with a stated objective of generating a positive externality. In order to be able to interpret the investment rate differential between impact and traditional VC funds, β, we implement a within estimator, where our identification comes from including dynamic grouped LP fixed-effects. The model levels variation across investors in the number of investments made per year. This normalization allows us to then interpret β as the incremental effect of being an impact fund on the investment rate by a representative LP.

In particular, we pool LP investors into 363 groups where the grouping combines investors in the same LP type (e.g., development organization, bank, foundation, pension, etc.) with the same average number of investments per year made in the prior three years. This grouping is dynamic since an investor can move into different groups as its VC portfolio grows or shrinks over time – a distinct advantage over static investor fixed effects. In principle, we could estimate a static investor fixed effects model, but doing so would miss variation in an investor's interest in VC over time, which is captured by our dynamic fixed effects. In addition, logit models with high dimension fixed effects are difficult to estimate with confidence. Nonetheless, our results are similar in linear probability models with static LP fixed effects or even with LP-year fixed effects. To further capture temporal dynamics in investor investment rates, we include investors' years of experience in VC investments.

Next, to prevent the *IMPACT* coefficient from picking up LPs' portfolio choice demand for particular investment characteristics, we include fixed effects for fund vintage, geography and industry. With the same motivation, we also include two *MatchCharacteristics,* variables capturing paired characteristics between the investor and the particular fund considered for investment. First, following Hochberg and Rauh (2013),[5] we include a home bias variable, defined as whether fund *j* focuses its

[5] Hochberg and Rauh (2013) document that U.S. LPs, particularly U.S. public pension funds, tilt their private equity portfolios toward local funds. More generally, there is a large literature exploring the reasons for local tilts in

investments on the home region of investor *i*, where we consider eight major regions globally. Second, because the prior relationship between an investor and a particular VC fund manager matters (Hochberg, Ljungqvist, and Vissing-Jørgensen (2014)),[6] we include an indicator variable for a prior investment relationship between investor *i* and any prior fund managed by fund *j'*s fund manager.

Finally, we include two other important fund-level variables, *FundCharacteristics,* affecting the investment rate. First, funds with larger expected size will be matched with more investors and thus have a higher investment rate. However, the ex post fund size will also reflect investors' priors on manager skill and thus be positively correlated with the fund's expected return (Berk and Green (2004); Hochberg, Ljungqvist, and Vissing-Jørgensen (2014)).[7] We measure expected fund size as the 3-year prior average of the median fund size in the vintage and market (U.S. or non-U.S.), the intent being to avoid the possibility that this variable would vary with fund-specific expected return.

Second, ceteris paribus, investors have higher demand for funds managed by fund families with better past performance (Gompers and Lerner (1998); Kaplan and Schoar, 2005; Hochberg, Ljungqvist, and Vissing-Jørgensen (2014); Chung et al. (2012); Barber and Yasuda (2016)). We measure the fund's expected return using the performance of past funds managed by the same fund family. To benchmark fund performance, we calculate the percentile rank of each fund's performance relative to its vintage year cohort funds using IRRs and/or value multiples, taking the average percentile rank based on the two performance measures when both are available. We calculate a weighted moving average across all past funds, where recent funds receive greater weight relative to older funds. This follows the industry practice where investors often look for top quartile fund managers based on peer-adjusted relative performance measures. To account for funds without past performance data, we include an indicator variable for first-time funds and an indicator variable for seasoned funds with missing past performance data. We ensure our results are robust to exclusion of past performance variables (see Appendix A, Table A1).

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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.

[6] 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.

[7] At the time of making investment decisions during fundraising, prospective investors observe neither the eventual size of the fund nor the fund's financial return. Instead, prospective investors base their investment decisions on their expectations about the fund size and fund performance, among other things.

B. Investment Rate Model Interpretation

We use the terminology of *supply not keeping up with demand* or *demand not keeping up with supply* to describe results from the investment rate analysis, and we first explain a key assumption required to make such statements. In the example mentioned earlier, the representative LP demanded 3 out of 300 funds offered in the year, resulting in an investment rate of 0.01. Suppose that is the traditional VC fund investment rate. The traditional VC industry has existed in its current fund format since the early 1980's and is considered a mature asset class (e.g., Sensoy and Weisbach (2014)). Thus, we assume that the traditional VC investment rate (0.01 in this example) reflects sophisticated fund managers correctly forecasting and meeting expected demand from investors on average.

Now suppose that the same representative LP instead has an investment rate of 0.0133 for impact funds. We use the terminology *supply is not keeping up with demand* for impact in this case by using the traditional VC fund market as the benchmark. Note that the *keeping up* phrase need not imply a temporal effect and the source of the higher investment rate could be the numerator (more investments chosen) or the denominator (fewer funds raised): That is, the LP may have demanded 4 rather than 3 investments (4/300 = 0.0133), or the number of impact funds in the market may have been only 225 rather than 300 (3/225=0.0133). Lower supply per unit of demand might be due to costly frictions in the managers' ability to raise or manage impact funds, such as scarcities of capable, experienced entrepreneurs and investment professionals in the impact industry. Alternatively, realized demand might simply be higher than that which the prospective impact fund managers expected in our sample period. Conversely, suppose that the investment rate is lower in impact funds. In this scenario, demand is not keeping up with supply. Fund managers who make fundraising decisions may be too optimistic about impact demand or former venture capitalists-turned-quasi-philanthropists willing to subsidize impact funds for causes they support.

It is not our agenda to pin down what supply frictions or misunderstanding of demand makes investment rates into impact funds differ from those into traditional VC funds. Rather our goal is to document if supply is keeping up with demand for impact by using the investment rate in traditional VC funds as a benchmark, and then to use this differential investment rate as a yardstick in the second part of the paper to uncover the sources of demand for impact.

C. Investor Attributes Model: Sources of and Hindrances against Demand for Impact

If we identify a different (larger or smaller) investment rate for impact funds, it must be that some group(s) of investors account for the underlying demand for impact identified in the differential. In the second part of our paper, we first characterize demand, analyzing whether the investment rate varies over time and across different investor groups: UNPRI signers v. non-signers, LPs from different regions, and

different LP types. Then, we analyze the origins of demand identified in the investment rate differentials by studying inherent investor attributes shared across LP types and investing rules and regulations shared across LP types and locations.

Our investor attribute model exploits two sources of variation. First, we study a set of legal restrictions that do not apply to all geographies (e.g., ERISA is a U.S. law). Second, we study combinations of time-invariant investor attributes (e.g., private U.S. pensions are subject to ERISA *and* reflect constituents who are households) that are distinct from the time-varying LP group fixed effects. The LP group fixed effect (described above) absorbs, for example, the average investment rate of a set of foundations with five fund investments in the prior three years. The grouping varies year-to-year, allowing for separate identification of the investor attribute effects.

We start with the same logit investment rate model as before, and add six investor attributes, introduced below, and their interactions with *Impact*. With the LP group fixed effects and fund characteristic controls included in the model, we interpret the results of this model as reflecting the sources of investor variation in impact demand that cause the differences in investment rates we identify when we estimate equation (1). We argue that the results of this analysis are plausibly causal, with the appropriate caveats. In particular, it could be that another characteristic of LPs is correlated with the attributes whose effect on the investment rate is the object of our identification. However, such an omitted variable would have to have a correlation that remains after including the dynamic LP group fixed effects and all of the fund-level controls. In our view, this is a tall order. With this caveat in mind, this specification enables us to interpret attribute results as being a *source of* or *restriction against* demand for impact. This *source of demand* interpretation is in the sense that some investors must ultimately cause the differential investment rate we estimate for impact relative to the investment rate for traditional VC funds.

The investor attributes are a function of LP type and geography. We consider ten different LP types: *Development Organizations* include multinational, national, and regional organizations that invest with development purposes in mind (e.g., International Finance Corporation, Ireland Strategic Investment Fund, and New Mexico State Investment Council). *Corporation & 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).[8] *Wealth Managers* include family offices (e.g., Merrion Family Trust) and advisers who serve retail or high net worth clients (e.g., BNY Mellon Wealth Management). *Private Pensions* are primarily corporate pensions, but also include multiemployer retirement funds (e.g.,

[8] We sort sovereign wealth funds into development organization and government portfolios following Dyck and Morse (2010).

Carpenters' Pension Fund of Illinois).[9] *Foundations*, *Banks*, *Insurance*, *Endowments*, and *Public Pensions* are self-explanatory. Finally, *Institutional Asset Managers*, a residual category, include LPs who manage money for a diverse institutional client base (e.g., Adams Street Partners), where the capital appears to be primarily institutional capital, and its constituents are mixed.

In Table 1, we present six LP attributes (across columns) and their mapping to the ten LP types (rows). The first three attributes characterize inherent LP features that plausibly affect demand (positive or negative) for impact. In column one (*Household*), we categorize investors based on the constituents of the capital (organizations or households). Wealth managers and the two types of pensions serve households as the ultimate constituents. In column two (*Intermediated*), we classify the LP types based on whether the capital is intermediated through an asset manager, with an observation that intermediation creates distance between the ultimate owner of capital and those who facilitate capital allocations. This distance might hinder or encourage the demand for impact on average depending on whether pooling with other investors facilitates or impedes ultimate capital holders' access to impact funds when that is the desired outcome. In column three (*Mission*), we identify investors that have an impact mission as a primary goal. Development organizations and foundations 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).

The last three attributes characterize the implicit or explicit rules around impact investing that investors face. In column four (*Pressure*), we identify pressures that encourage impact investment. U.S. banks, U.S. insurance companies, and public pensions face political or regulatory pressure that may induce them to invest locally or in underserved communities. In the U.S., commercial banks are subject to certain lending and investment obligations to serve their local low- and moderate-income communities under the Community Reinvestment Act (CRA). Banks are permitted to invest in community development venture capital funds that provide equity financing to businesses in underserved communities as a way to fulfill the investment test part of their CRA obligation (CRA Investment Handbook, 2010, p.24). Likewise, insurance companies in some of the large U.S. states (e.g., Texas, New York, and California) must comply with state-level insurance regulations akin to the CRA that require them to invest in local communities. Even outside of those states, insurance companies in the U.S may face pressure to invest in impact locally in order to preempt passage of a federal CRA-like regulation for insurance (Gainer (2009). Thus, U.S. banks and insurance companies have incentives to invest in impact funds that serve low- to moderate-income communities, especially if such investments garner goodwill from customers. Banks and insurance companies in other countries face less such pressure. Public

[9] There are 81 multiemployer pension funds and the majority are union-backed. Our results by LP type and LP attributes are qualitatively similar if we group these multiemployer pension funds with public pensions.

pensions worldwide, despite commonly being subject to a fiduciary duty standard, may face political pressure to increase the (perceived or real) welfare of voting populations. Public pensions may also face pressure to serve the political interests of their boards, which are often pro-labor and consider local job creation as an important policy goal. Consistent with this idea, Dyck, Manoel, Morse, and Pomorski (2016) and Andonov, Hochberg, and Rauh (2016) both document that the investments of public pensions are affected by the degree to which the boards governing the pensions are appointed by government officials.

In column five (*Laws*), we highlight legal impediments to impact investing. Foundations, Endowments, and Private Pensions in the U.S. face more restrictive fiduciary standards than their non-U.S. counterparts, while Public Pensions face similar, restrictive fiduciary standards around the world. In the U.S., private pensions are subject to the 1974 Employee Retirement Income Security Act (ERISA) fiduciary guidelines, which state a 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".[10] Non-financial factors can be considered when they do not adversely affect risk or returns.[11] Public Pensions are subject to state- and national-level legislations regulations worldwide, generally through legislative action. For example, U.S. state regulations governing Public Pensions often closely follow ERISA. Interestingly, impact funds are often loath to admit the existence of any trade-offs between the positive externality they generate and the financial return they earn. The careful rhetoric used by impact funds may be an attempt to cater to fiduciary investors' need to appear uncompromising in their search for financial returns.

Analogous to ERISA, the Uniform Prudent Management of Funds Act (UPMIFA) governs the management of Foundations and university Endowments in the U.S. and generally imposes fiduciary duties of care and prudence that are similar to those of ERISA (see Geczy, Jeffers, Musto and Tucker (2015)). However, unlike ERISA, UPMIFA provides an additional duty of obedience to the unique charitable mission of the organization. Notwithstanding this duty of obedience provision, we suspect that foundations have been constrained by the UPMIFA because investment decisions are generally detached from pursuit of the organizational mission at U.S. foundations. Furthermore, tax laws in the U.S. create an additional hurdle. The U.S. tax authority requires Foundations to maintain a 5% annual payout rate to keep their tax-exempt status. Foundations can make impact investments designated as program-related investments (PRIs) and count these investments towards the required 5% payout rate if certain eligibility

[10] Johnson (2014).

[11] The ERISA guideline issued in 2008 and in effect until 2015 went even further, stating that pensions that consider noneconomic factors could be challenged later for noncompliance with ERISA absent a written record demonstrating no financial sacrifice was made. The new ERISA guideline issued in 2015 withdraws this language and reverts to the original ERISA restrictions. See: https://www.dol.gov/opa/media/press/ebsa/ebsa20152045.htm.

tests are met.[12] While the policy may have been intended to encourage PRIs, the ambiguity around the test outcome and the perceived threat of tax-exempt status loss may subdue Foundations' demand for impact.

In column six (*Charters*), we identify restrictions against impact investment in the form of organizational charters. We exclude from column six the entities already covered by legal restrictions (column five) under the assumption that legal restrictions are more binding. Charters require organizations to maximize value for shareholders, which may constrain investments into impact funds. Charters govern Banks, Insurance, and Corporations, and ensure that management maximizes value to shareholders. Similarly, non-U.S. private pensions are subject to fiduciary responsibility via their parent corporate charter. Institutional Asset Managers, who manage a pool of capital from these entities, are also required by suitability and fiduciary standards to manage investments in the interests of their clients, thereby imposing these restrictions on their investment allocation decisions on behalf of their charter-bound clients. To the extent that institutional asset managers also manage capital on behalf of other clients, our estimate for Charter Restriction will be conservative.

II. DATA

A. Datasets

We employ three primary datasets. First, we use Preqin's Investor Intelligence data to identify LP investments in funds. 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.[13] We supplement 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 investments.

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), in addition to pursuing financial returns. We summarize the steps used to identify impact funds here, but provide details in Appendix B. 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 that invest primarily in companies located in poverty-stricken countries. We then manually read descriptions and online resources about funds and fund

[12] Specifically, the PRIs must further the foundation's organization mission, and the financial returns cannot be 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 PRI eligibility requirement if it makes too much profit ex post.

[13] We also include fund of funds that primarily invest in VC funds.

families, strictly requiring that a fund must explicitly state an externality objective to be deemed an impact fund in our dataset. We likely fail to designate some funds as impact due to a lack of detailed information, but our coding approach cleanly identifies impact funds as those with a dual objective of generating both financial returns and a positive externality.

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."[14] Bridges has several funds in our sample including, for example, 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 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."[15]

To parsimoniously summarize these diverse impact goals, we construct seven, non-mutually exclusive impact categories: environmental impact, minority and women funding, poverty alleviation, social concerns, social infrastructure development, small and medium-sized enterprise (SME) funding, and geography-focused impact excluding poverty regions. Two categories require further explanation. Social concern funds invest in firms that that address social concerns or measure the social impact of its investments. Geography-focused impact funds are funds that have a clear objective of creating jobs or economic development in a specific region, but we exclude funds with poverty alleviation focus in order to avoid high degree of correlation between the two (geo and poverty) categories. For each impact fund, we read fund descriptions in three databases (Preqin, Capital IQ, and ThomsonOne) as well as in the fund's own marketing materials on their websites and code the impact objectives of the fund using these seven categories, allowing funds to have multiple objectives. Figure 1 depicts the percentage of the 161 impact funds that have a stated impact goal, with the counts of funds displayed at the top of each bar. The smallest impact categories are minority and women funding (11% of funds) and social infrastructure development, which includes health and education as well as other social or physical infrastructure (16%). The remaining impact categories are more common and relatively uniformly distributed with the most

[14] Company website, November 17, 2015 (http://bridgesventures.com/about-us/).
[15] http://www.bloomberg.com/research/stocks/private/snapshot.asp?privcapId=156715

prevalent being poverty alleviation (43%) and SME funding (42%), followed by geography focus excluding poverty (33%), environmental impact (29%) and social concerns (27%).

Our final dataset is a list of UNPRI signatories, which we downloaded from the UNPRI website.[16] As of November 16, 2015, there were 1,422 signatories (297 asset owners, 931 investment managers, and 194 professional service managers) who collectively manage $59 trillion. 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 and Investment Statistics

We categorize each LP to reflect one of ten LP Types (Development Organization, Foundation, Bank, Insurance, Endowment, Corporation/Government Portfolio, Institutional Asset Manager, Wealth Manager, Private Pension, and Public Pension). We accomplish this with manual web searches for each LP in our sample. The goal is to attribute the capital to the constituent (rather than the intermediary). Thus, for asset managers, we search each manager to uncover whether the asset manager specializes in servicing a particular constituent (e.g., public pensions).

In Table 2, 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 investments by LP type generally mirrors the patterns of LP numbers, though both pension categories have more investments per LP while Banks and Corporations/Government Portfolios have fewer. The most active investors are Public Pensions (16.67 funds per investor), Private Pensions (9.35 funds) and Development Organizations (8.14 funds), relative to about 7 investments into funds for the average LP. 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. Overall, 9% of LPs (315) are UNPRI signatories. Institutional Asset Managers are the most likely to sign the UNPRI (19.5%), followed by Insurance (13.8%) and Public Pensions

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[16] 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.*

(13.5%). Foundations, Corporations/ Government Portfolios and Endowment are extremely unlikely to be UNPRI signatories.

The last two rows of panel A present statistics across the 25,435 investments made by the 3,504 LPs. The penultimate row of Panel A reports that in about 1/3rd of all investments, there is a prior relationship between the LP and fund family. Likewise, the home bias rate is strikingly large with 3/4^{ths} of investments made into funds focusing on the home region of the LP headquarters.[17]

In Table 2, Panel B, we present the regional distribution of LP headquarters.[18] Focusing on all LPs (last column of Table 2), 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-Pacific.

*C. **Funds Statistics***

We analyze investments in 5,053 funds with vintage years from 1985 to 2014; about 75% of funds have vintage years of 2000 or later. In Table 3, we present descriptive statistics on the 4,892 Traditional Funds on the left side and the 161 impact funds on the right side.

Because our empirics are at the investment level rather than the capital commitment levels, it is important for inference that the capital commitments per investment for impact and traditional funds are similar. Traditional VC funds are somewhat larger than impact funds ($196 million v. $128 million when comparing the average fund size and $100 million versus $78.7 million when comparing the median fund size). This could be due to the mix of VC and growth capital funds. Thus, we examine the individual commitment amounts. Though we observe 25,435 investments, commitment amounts are available for only 8,587 (33.7%). For this sample, the mean and median capital commitment (first taking the average across investors in a fund and calculating statistics across funds) for traditional VC funds is $21 million and $13 million. Impact funds have larger capital commitments, with the mean and median being $27 and $15 million. One might wonder if the difference arises because we are more likely to observe investment size for traditional funds and thus are more likely to observe smaller capital commitments. This does not

[17] 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-Pacific and Middle East into "Emerging Asia-Pacific." However, to establish an LP-fund geography match we continue to employ the eight-region code first and then combine the eight home-bias dummies into five.

[18] For development organizations, we manually coded geographic foci of their missions and used them instead of the actual headquarters location. For example, Inter-American Development Bank is headquartered in the U.S., but its mission is focused on South and Central America.

appear to be the case as we observe proportionately more investment amounts for impact investments (37.9%) than for traditional funds (33.6%).

In other statistics, impact funds are newer with a vintage year average of 2006 versus 2004 for traditional funds. Impact funds are managed by fund families with substantially lower past performance. The past excess IRRs in impact funds are -0.49% versus 4.15% for traditional funds. [19] The past percentile rank for impact funds is also lower than that of traditional funds, 0.42 (i.e., 42nd percentile in performance for the vintage cohort) for impact versus 0.54 for traditional. Similarly, the current fund excess IRR is lower (-5.88% v. 1.08%), which translates to lower fund percentile ranks (0.34 v. 0.49).[20]

Collapsing Preqin codes of the geographic focus of fund investments to eight regions, we designate a fund to have a geographic focus if more than a third of all geographic descriptors are concentrated in a given region. Most funds (84%) focus on only one of the eight global regions. Panel B of Table 3 reports that impact funds tilt more toward developing countries including Africa, Latin America, and Emerging Europe than traditional funds. We do the same exercise for industry foci, collapsing the Preqin codes to 11 different industries (business services, energy, consumer, diversified, industrials, information technology, health care, infrastructure, food and agriculture, real estate, and media/communications) and coding a fund as having an industry focus if more than a third of industry sector descriptors are concentrated in a given industry. Both self-described diversified funds and funds that lack any focus on particular industries (according to our coding method) are categorized as "diversified". Panel C of Table 3 reports that impact funds are more likely to be energy or diversified funds, and less likely to be IT, health care, or media and communication funds than traditional VC funds.

III. RESULTS: THE EFFECT OF IMPACT ON INVESTMENT RATES

Using the investment rate logit model, Table 3 reports that the supply of impact funds is not keeping up with demand for impact. An observation in Table 3 is a potential investment by an LP in a fund, estimated over 3 million observations, which reflect the crossing of all funds of a vintage year with all LPs that make at least one fund investment in that vintage year. Being an impact fund increases the investment rate by 0.00116. The base investment rate into traditional VC funds is 0.0082; an LP chooses

[19] We calculate the past fund excess internal rate of return (IRR) in two steps. First, for each past fund managed by the fund family, we calculate its excess IRR as the fund's IRR minus the average IRR of the funds from the same vintage year, fund type, and region cohort ("benchmark IRR"). For some funds, we observe value multiples but not IRRs. For these funds, we calculate percentile ranks based on value multiples. When we have percentile ranks based on both IRR and value multiples, we use the average of the two percentile ranks. Second, we calculate a weighted average of past fund excess IRRs for the fund family giving more weight to recent funds (using an exponential moving average of all past fund excess IRRs with a smoothing factor of 0.5) and requiring that the past fund be at least 5 years old at the time of the current fund's inception to be included in the calculation.

[20] In work in progress, we analyze the performance differences between impact funds and conventional funds in more depth.

to invest in 0.82 out of every 100 (or 1 out of 122) traditional VC funds offered in the market that vintage year. Thus, an increase of this rate to 0.94 out of every 100 (or 1 out of 106) funds is an economically significant increase of 0.116/0.82 = 14.1% in the investment rate, which we refer to as the scaled marginal effect.

Table 3 also reports the coefficients on other determinants of VC investment, with findings in line with the literature. Higher past fund family performance and larger expected fund size have a positive and significant effect on the investment rate. By contrast, being a first-time fund or a fund missing past performance data has a reliably negative effect on the investment rate. The remainder of the table summarizes the marginal effect of fund industry, fund geography, prior relationship between the LP and fund family, and the location of the LP and fund. Of these variables, the prior relationship between the LP and fund family is clearly the most important economically. Home bias is also economically important; LPs are much more likely to invest in a fund that invests in companies in the same region.

To assess the economic importance of the determinants of fund choice, we propose a new measure to the literature, a partial R^2 version of the Tjur R^2 (Tjur (2013)). The Tjur R^2 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). We calculate a Partial Tjur R^2, by excluding sets of variables and re-calculating how much Tjur R^2 is lost. We find that 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 (2013), among others. Importantly for our design, the LP investment group fixed effects also matter, accounting for 4.4% of the total explained variation in investment rates (or a third of the residual variance explained after excluding the relationship variable).[21]

As a robustness check we estimate Equation (1) using a linear probability model rather than the logit model and use static LP fixed effects rather than LP investment group fixed effects. Column 2 of Appendix Table A1 reports that the coefficient on the *IMPACT* variable is reliably positive and significant, with the scaled marginal effect of 24%, slightly larger but in the same order of magnitude to our logit estimate. Column 3 introduces an even more stringent model, including LP fixed effects crossed with year fixed effects, and yields results on the *IMPACT* coefficient virtually identical to those in column 2.

[21] It is perhaps surprising that the past performance variable has little partial R-square. This statement is not entirely accurate, however. Only a third of the funds have observable past performance. For the missing past performance observations, we put past performance as zero and flag these observations equal to one in a missing past performance variable. When we instead implement this model with only observations that have past performance, we find that our main impact results are robust and the past performance variable explains 20% of the total Tjur R-squared.

Another concern with our binary choice model is that the dependent variable captures only the incidence of a commitment, but not the actual commitment size. We show in the Table 3 that individual commitments in impact funds are larger in dollar amounts, which diminishes this concern. To rule out the possibility that this univariate comparison of LP commitment amounts is driven by differences in fund and/or investor characteristics, we regress the log of observed LP commitment amount (for the actual investments made) on the same set of explanatory variables as in Table 3. In unreported results, we find that LP commitment amounts made in impact funds are not significantly different from those in traditional VC funds. This evidence indicates investment size does not materially differ between impact funds and traditional VC funds and provides comfort that our analysis of the incidence of investment yields accurate inference.

Table 5 investigates whether the finding of demand outpacing supply relative to the traditional VC market varies across the impact categories from Figure 1. Column 1 reports a model including *IMPACT* and separate dummy variables for each type of impact category. The same fund can address multiple impact categories, so the impact category dummy variables are not mutually exclusive subsets of the main impact dummy variable. Column 2 tests the robustness of the column 1 model results by estimating separate logit models for seven subsamples based on the seven impact categories. For example, we form the subsample for the environmental category by combining the sample of traditional VC funds and 46 impact funds with the focus on environmental impact. The first column has better statistical properties, but may suffer from certain categories being highly correlated. Thus, we report column 2 to alleviate concerns that multicollinearity may be generating unusual coefficient estimates given the small sample for some impact categories.

We find (interpreting only column 1) the higher investment rates for impact investing in environmental funds (15.3%), women and minority funding (14.6%), poverty alleviation (18.6%), and fund addressing specific social concerns (19.4%). These are all arguably categories with high public good or externality content. In contrast, SME funds have, if anything, lower investment rates, though only in column 1, in which we control for the other impact categories of a fund. Notably, 57% of impact funds in the SME category also have a poverty focus and are thus captured by the poverty category; SME funds without a poverty focus often target particular geographic areas (e.g. Oregon Investment Fund) and do not attract demand from investors other than local financial institutions and pensions.

To summarize, we find that, for the representative LP and holding other fund characteristics constant, the marginal effect of being an impact fund on the investment rate is positive. Going forward, we refer to this higher investment rate as above market demand, to shorten the wording, however noting that the source of the higher investment rate could well be supply frictions or higher realized demand than expected. Our findings of the four impact categories that exhibit higher investment rates (environmental,

poverty, women and minority, and social concern funds) suggest support for both mechanisms. For example, realized demand for environmental impact funds might have outpaced the prospective fund managers' expectation in recent years, while the inception of women and minority funds might have suffered from scarcities in human resources (for entrepreneurs and fund managers alike). These are merely conjectures and we leave these issues for future research.

IV. RESULTS: INVESTOR ATTRIBUTES AND IMPACT

We explore the heterogeneity in demand for impact among investors by building on the observation that some investors must account for the higher investment rate for impact funds relative to traditional VC funds. Specifically, in this section we use the differential demand for impact (relative to traditional VC) as a yardstick and explore who matters for impact investing and why.

A. Characterizing and Validating Demand for Impact

Circumstantial evidence suggests that demand for impact should be higher for investors (i) signing the UNPRI, (ii) active in more recent periods, and (iii) from Europe. For example, in their 2014 report the Global Sustainable Investment Alliance (GSIA) reports that 59% of total managed assets in Europe are in SRI strategies compared to only 18% of assets in the US, 17% of assets in Australia, and 1% of assets in Asia. This suggests that Europeans value externalities more than North Americans.[22] Likewise, those signing the UNPRI are doing so with a cost of compliance, implying that our tests should pick up a higher demand for impact among UNPRI signatories.[23] Finally, investor, governmental, and

[22] Liang and Renneboog (forthcoming) document that the country's legal origin is more strongly correlated with the firm's CSR practice than "doing well by doing good" factors, resulting in civil law firms assuming higher level of CSR than common law firms. Dyck et al. (2016) find that foreign ownership by European institutional investors are associated with higher firm-level environmental and social performance, suggesting that they transplant their social norms into the firms they hold overseas. While a full assessment of culture is beyond the scope of this paper, it is entirely possible that differences in cultural values shape both beliefs and institutions across countries in a way that determines the demand for impact. We use the Hofstede (2010) measures of cultural values at the country level to consider whether cultural values expressed by Europeans differ from those of Americans. We compare the average scores in Europe to those in the United States for three relevant categories – Individualism v Collectivism, Long-Term Orientation, and Indulgence v Restraint. Relative to Americans on a scale of 0 to 100, Europeans have a score tilted at least 25 points toward having a collective agenda versus individualistic agenda, having a long term view of society, and having more restraint versus being indulgent. These values are at least consistent with Europeans putting a higher value on investments that generate positive externalities.

[23] Being a UNPRI signatory may reflect different motives across investor types. For asset managers whose clients do not value the SRI options, the cost associated with UNPRI compliance may be too high relative to its benefits. However, 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 direct (non-intermediated) holders of capital, the motivation for signing the UNPRI could be more transparent as a signal of belief in principles. Likewise, signing may be a form of protection. For example, public pension funds may use UNPRI compliance as protection against potential lawsuits for breach of fiduciary duty, when they face political pressure to invest with impact. Consistent with these motives we find – in an

media attention given to impact investing has grown in recent years (e.g., yielding the 2013 G7 Social Impact Investment Forum, spearheaded by UK Prime Minister David Cameron). Our results should also reflect a heightened demand for impact in more recent periods. We use these markers (UNPRI status, time, and geography) to test the validity of our empirical method and provide more evidence describing demand.

A.1. UNPRI Signatories

In column 1 of Table 6, we present the main impact result from Table 4 and the associated scaled marginal effect on fund demand of 14.1% for reference. In column 2, we augment the main model of Table 4 with a *UNPRI* dummy and the interaction of *UNPRI* with *IMPACT*, reporting marginal effects and scaled marginal effects, which is the marginal effect divided by the investors' baseline investment rate conditional on signatory status. Consistent with conventional wisdom, UNPRI signatories have greater demand for impact relative to supply. The marginal effect estimate is 0.00296, an increase of 25.8% over the baseline investment rate for signers, which is 1.12 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 7.8% of the baseline investment rate for non-signers.

A.2. Temporal Variation

Next we look to validate our model by testing whether the above-market demand for impact shows a secular time trend during our sample period, as one might expect. This is not an obvious prediction because supply is likely evolving as well. In column 3 of Table 6, we report estimates with the key *Impact* variable interacted with a post-2007 dummy (the split of our fund observation sample). The results indicate an above market demand for impact in both subperiods, however the above market demand has increased more than threefold post-2007 relative to pre-2007.

The secular increase in the demand for impact relative to supply is more pronounced among UNPRI signatories. This conclusion comes from column 4 of Table 6, which contains the marginal effects of the triple interaction of impact status, fund vintage years (pre-2007 v. post-2007), and UNPRI signer. Prior to 2007, only UNPRI signers have reliably positive above market demand for impact investments (with a 11.1% scaled marginal effect on impact fund demand). After 2007, above market demand for impact from UNPRI signatories increases more than fourfold (to 48.5%), though in this later period even non-signers exhibit 10.1% of above market demand for impact investment over traditional VC.

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unreported analysis where we interact the UNPRI signatory indicator with each of the ten LP types – that *only* the UNPRI signers have significant above market demand for impact among (i) asset managers, (ii) foundations, and (iii) private pensions.

A.3. European v. Other Locations

We separately estimate our main logit model for five investor regions: North America, Developed Europe, Developed Asia-Pacific, Emerging Asia-Pacific, and the Rest of the World. The results of this analysis are presented in Table 7. Focusing on the first row of the table, we find that investors in Europe have 23.7% more demand-relative-to-supply for impact funds than for Traditional Funds. North American investors have a more modest 8.5% above-market demand, a third the size of the above-market demand for impact by Europeans.

When we run our second model, which interacts UNPRI signatory status with impact funds, we find that all of the demand for impact in North America comes from UNPRI signatories, which echoes our earlier finding that the secular increase in above market demand is driven primarily by UNPRI signatories. In Developed Europe, both signatories and non-signatories have positive demand for impact (although the demand is somewhat stronger among European signatories). In the remaining three regions, we find evidence of significant demand for impact by UNPRI signatories in the Rest of the World, which includes Emerging Europe, Africa, and Central and South America.

B. Demand by LP Type

Figure 2 is a pie chart representation of the composition of investors in impact and traditional VC funds. For traditional VC funds, Public and Private Pension Funds together comprise 42% of the investments, followed by Foundations (11.5%) and Institutional Asset Managers (14%). For impact funds, Development Organizations (28.3%) and Public Pensions (25.1) are by far the most important sources of capital. This simple pie chart reflects considerable variation in the types of investors who choose impact funds versus traditional VC funds, but does not reveal whether the demand for impact is positive for a particular LP type once we control for investor and fund characteristics. It is plausible that all investor types have a positive demand for impact, but that effect of impact on demand varies across investor type yielding the differences we observe in Figure 2. Thus we further examine these differences across LP types in the logit model setting as before.

In Table 8, we present the main logit model results estimated separately for the ten LP types. Consistent with the heterogeneity in the clienteles that we observe in Figure 2, investment rate results confirm considerable variation in the demand for impact by LP type. In reporting the estimates, we scale the marginal effects by the investor-specific investment rates since base investment rates vary across LP types. We find above market demand for five LP types: Development Organizations (with a scaled marginal effect of 17.7%), Foundations (11.1%), Banks (22.2%), Insurance (24.0%), and Public Pensions (17.3%). In contrast, Endowments exhibit below market demand for impact, with 31.1% less demand for impact funds relative to traditional VC funds. Corporations and Private Pensions also exhibit a negative

logit coefficient, but the results are not statistically significant. Having shown that there is considerable heterogeneity across different LP types in their demand for impact, we now turn to our LP attribute model results to examine what factors if any explain this variation.

C. Investor Attributes and the Demand for Impact

To identify which of the six LP attributes from Table 1 affect the demand for impact, we modify our main logit model to include the level effect of the six LP attribute dummy variables and their interactions with the *IMPACT*. After estimation, we calculate the scaled marginal effects as the sum of the marginal effect of *IMPACT* (the direct effect) and the marginal effect of *IMPACT* interacted with the attribute, dividing by the baseline investment rate (conditional on LP types with the attribute). The results are presented in Table 9. With the LP group fixed effects and fund characteristic controls included in the model, we interpret the attribute results as reflecting the sources of investor variation in impact demand that cause the differential investment rate for impact in our investment rate model.

C.1. *Main Attribute Results*

In Table 1, we group the attributes into those that are inherent to the LP (*Households*, *Mission-Oriented* and *Intermediated*) and those that come from external sources affecting the LPs' decisions (*Pressured*, subject to *Legal Restrictions*, and subject to *Charter Restrictions*).

Among inherent attributes, we find three results relating attributes to impact demand. First, *Households* as ultimate constituents have greater demand for impact investment vehicles than organizations do. In particular, *Households* on the margin have 13.1% higher investment rates into impact funds relative to that into traditional VC. Households may derive utility from externalities (e.g., because they enjoy the externality of a thriving local economy or they desire environmental protection for the next generation). Because we show that Europeans have higher demand for impact than investors in North America, we re-run the household attribute result by region. In unreported results, we find that European households have twice the investment rate of North American households in impact funds. This echoes prior studies (e.g., Liang and Renneboog (forthcoming) and Dyck et al. (2016)) that suggest Europeans place a higher value on generation of positive externalities.

Second, investors with *Mission* objectives have 39.5% higher investment rates in impact funds. It is perhaps not surprising that mission-based organizations (foundations plus governmental and non-governmental development organizations), ceteris paribus, have greater demand for impact. However, given the magnitude of this result, one plausible conjecture (not examined in this paper) is that *Mission* investors support the impact funds as anchor investors to enable them to reach above a threshold scale, thus allowing provision of more impact investment opportunities to other investors than would be

possible otherwise. The role of *Mission* investors is little considered by finance research outside of their role in philanthropy markets.

Third, *Intermediated* capital exhibits 16.2% lower investment rates. This result is weaker statistically in that the interaction coefficient of Intermediated*IMPACT alone is not statistically significant, but the sum of this with the IMPACT level effect is significantly negative. Thus, we conclude that intermediation on average does not encourage impact investing and that the distance between the providers of capital and managers who allocate capital may dilute the demand for impact.

We now turn to the external attributes affecting LP decisions. These external attributes are critically important to contributions of our paper because not only is the effect of these external attributes large, but they are also potentially changeable aspects of the investment environment—not features baked into a specific organizational form. We have two additional findings.

Fourth, investors facing *Pressure* from political or regulatory institutions exhibit 26.1% higher investment rates into impact funds. Some investors are not driven to impact in a vacuum but by the structure deliberately built into their environment by regulation and politics. The number of investments accounted for by the institutions in this category is large, implying that *Pressure*, explicit or implicit, may imply real economy effects for certain geographic areas. More evidence is needed as to the welfare implications of these investment outcomes.

Fifth, we find that LPs with *Laws* against impact investing have significantly lower investment rates into impact funds. The magnitude is a large 41.8% reduction. This finding is particularly interesting because we find that having *Charter* Restrictions against impact alone does not materially affect their demand for impact on average. Laws like ERISA and UPMIFA matter. In contrast, shareholders' recourses (e.g., lawsuits and management turnover) do not seem to bind against impact investing in a way that we can identify.

C.2. *Economic Magnitude of Attribute Results & Robustness of Interpretation*

The fourth and fifth results above provide a lens through which to frame the economic importance of impact investing because these two mutable characteristics generate large effects on the demand for impact. On the one hand, *Pressure* – whether it stems from positive rules designed to generate impact (e.g., CRA on *Banks*) or local political forces (e.g., *Public Pensions*) – is associated with elevated demand for impact investments. On the other hand, *Laws* that restrict impact investment (e.g., ERISA and UPMIFA rules regarding fiduciary responsibilities) are associated with significantly dampened demand. While we only claim that these results may plausibly be causal, our empirical method carefully accounts for investor-specific base investment rates (via inclusion of grouped LP fixed effects) and a myriad of fund and investor characteristics, thus allowing us to interpret the *IMPACT* coefficient as

the incremental effect of being an impact fund on the representative LP's investment rate. Thus these LP attributes results strongly suggest that changing the laws and regulations that govern investment can materially alter the demand for impact investment.

At the bottom of Table 9, we calculate the economic magnitude of these investor attribute results. We quantify the number of investments gained/lost as the product of the combined marginal effect on the investment rate (first column of the bottom panel) with the number of potential matches between LPs and impact funds. For example, if investors representing households are 1% more likely to invest in an impact fund than other investors and there are 10,000 potential matches between impact funds and household investors, then not having this increased investment probability by household investors would imply 10,000*0.01=100 fewer impact investments, or equivalent to 12% of the actual 829 investments observed in the data. These counterfactual gains/losses are reported in the last two columns of the bottom panel.

Households have an investment rate that is 0.0013 higher in impact funds than in traditional funds. There are about 40,000 potential investments in impact funds by *Household* LPs. If households had no greater investment rate in impact funds, the *Household* investors would have made 51.6 fewer investments in impact (= 40,000*0.0013), or 6% of the total impact investments in our sample. *Mission* and *Pressure* investors each accounts for about 9% of total demand for impact. *Laws* turns out to be an economically sizable hindrance, accounting for 25% of the total demand. The magnitude is large both because of the large number of LPs affected by the legal restrictions (1,258 out of 3,504), and because of the large magnitude of the negative coefficient (-41.8%). Extrapolating our results on impact funds to the overall sustainably and responsibly managed assets (estimated to be $13.6 trillion by the World Economic Forum (2014)), it is possible that we could increase private capital tilted towards generating public goods by as much as $3.4 trillion (25% of $13.6 trillion) by removing the legal impediments.

Finally, we conduct another robustness check to validate our investor attributes results. We argue that the investors' desire to generate externalities *locally* drives the *Household* and the *Pressure* effect but not the other effects. Households might derive greater utility from seeing local impact investments stimulating the local economy than those in remote areas far from their locales; that is, they might "internalize" the externalities more if they feel they belong to the same communities as the beneficiaries of the impact. Likewise, institutions facing *Pressure* (U.S. Banks, U.S. Insurance and Public Pensions worldwide) face regulatory or political pressure specifically to invest in underserved communities within their home markets or jurisdictions. In contrast, Foundations may have their headquarters in locations related to the source of the original wealth (e.g., New York) yet pursue their *Mission* in places where such missions are most valuable. Similarly, *Laws* such as ERISA do not differentiate between local and non-local investments. Thus, by analyzing the extent to which each of the individual LP attributes results

depends on local investments, we can further infer the validity of our interpretation for the main LP attributes results.

In Table 10, we include the triple interactions of *IMPACT*, each of the six LP attributes, and *homebias*, which equals one if the funds' geographic focus and the LPs' geographic location match. The model includes the level effects of each variable plus all double interactions. We find that, indeed for *Household* LPs and LPs under regulatory or political *Pressure*, their positive demand for impact is driven entirely by local investments. In contrast, for *Mission* investors and LPs facing *Laws* that restrict impact, local investments are not the drivers of their above market demand for impact.

V. CONCLUSION

We study the determinants of investor demand for impact funds, which are structured as VC funds with long lives and have a dual objective of generating a positive externality and earning a financial return. Using LP and fund data for over 5,000 funds and over 3,500 investors, we examine whether the impact funds face above or below market demand using a fund choice framework, which employs dynamic LP fixed effects and a battery of control variables (fund characteristics, LP characteristics, and fund-LP match characteristics) designed to isolate the marginal effect of being an impact fund on the representative LP's investment rate in the fund. The main result to emerge from our analysis is the observation that, ceteris paribus, impact funds have 14.1% greater probability of attracting investment than traditional VC funds. Assuming the market for traditional VC funds is complete, we refer to this increased probability as above market demand.

While all impact funds seek to earn a financial return, the impact goals of impact funds vary. We categorize the impact objectives into seven broad categories: environmental impact, minority and women funding, poverty alleviation, social concerns, social infrastructure (e.g., schools, health, or microfinance), economic development through small and medium enterprise (SME) funding, and geography-focused funds (excluding poverty). Of these categories, we document the above market demand for funds where the impact objective is environmental impact, minority and women funding, poverty alleviation, or addressing social concerns (with greater probabilities of attracting investment that range from 14.6% to 19.4%).

Several empirical results provide reassurance that our fund choice framework yields reliable inferences. The demand for impact is three times as strong for UNPRI signers versus non-signers. The demand for impact is three times as strong for European investors versus North American investors. Thus, being a UNPRI signatory is a marker for demand for impact, and European investors have on average higher demand than the U.S. and the rest of the world. Moreover, the demand for impact has grown more

than threefold after 2007, a result that is primarily driven by a more than fourfold increase in the demand for impact funds by UNPRI signatories after 2007 versus earlier years.

Who holds capital affects the demand for impact. We categorize LP investors into ten broad categories and find considerable variation in the demand for impact by these investor types. Being an impact fund elevates investor demand most significantly for development organizations (17.7% increase in demand), foundations (11.1%), banks (22.2%), insurance companies (24%), and public pensions (17.3. In contrast, some investors eschew impact funds, including endowments (-31.1%) and (with less precision) private pensions and corporate/government portfolios.

Most importantly, we analyze the determinants of the variation in demand across investor types and provide evidence regarding the mechanisms that generate this variation. To do so, we identify six attributes of investors that plausibly modulate the demand for impact. In our multivariate fund choice model, we find plausibly causal evidence consistent with the view that demand for impact is generated by (i) investors whose ultimate constituents are households (e.g., wealth managers who serve households v. corporations who serve shareholders), (ii) investors whose primary objective is impact (e.g., development banks or foundations), and (iii) investors that face political or regulatory pressure to invest in impact (e.g., banks in the U.S. that face CRA requirements). In contrast, we find that legal and regulatory restrictions (e.g., U.S. ERISA and UPMIFA) that impose strong fiduciary standards on investors dampen the demand for impact. These results suggest that implementing U.S. CRA-like regulation for non-U.S. financial institutions, and relaxing the strict ERISA interpretation of fiduciary duty in the U.S.,[24] could potentially dramatically increase demand for impact investments.

[24] The relaxation of ERISA in 2015 did not alter the requirement that consideration of noneconomic benefits in investment decisions is allowed only when the financial value is at least as good or better than the alternative choices. Our findings suggest that relaxing this requirement could induce the demand for impact among U.S. pensions to move more towards that of European pensions.

Appendix A: Robustness Checks

Table A1: Robustness of the Investment Rate Estimation

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. Column 1 is identical to Table 4 except the model excludes performance variables. Thus, column 1 is a logit model with dynamic group LP fixed effects. Columns 2 and 3 present estimation results from linear probability model. Column 2 includes LP fixed effects rather than the LP group fixed effects in column 1. Column 3 includes LP fixed effects crossed with vintage year. Impact equals one for impact funds. 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 plus one. Relationship is a dummy variable that equals one if the LP invested in a prior fund managed by the same fund family. Included but not displaeyed are fund-LP geography match, fund geography (5 regions), fund industry (12 sectors), and vintage year fixed effects.

	(1)	(2)	(3)
Estimation	Logit	Linear Probability	Linear Probability
Impact	0.00121***	0.00195***	0.00195***
	[0.000155]	[0.000263]	[0.000263]
Past Fund Performance Rank		0.00187***	0.00185***
		[0.000484]	[0.000482]
Missing Performance Dummy		-0.000294	-0.000289
		[0.000280]	[0.000279]
First Fund Dummy	-0.000600***	-0.000871***	-0.000862***
	[6.30e-05]	[0.000280]	[0.000279]
Expected Fund Size	-0.000201	0.000287	0.000279
	[0.000201]	[0.000461]	[0.000461]
Relation Dummy	0.0161***	0.396***	0.397***
	[0.000157]	[0.00340]	[0.00339]
Years in PE Investing	-0.000292***	0.00255***	
	[3.95e-05]	[0.000151]	
Dynamic LP Group Fixed Effects	Yes	No	No
LP Fixed Effects	No	Yes	No
LP x Year Fixed Effects	No	No	Yes
Other Fixed Effects in All Columns: Vintage Year, Industry, Geography, Geography*Home Region			
Observations	3,091,816	3,089,112	3,089,112
R2 (Tjur R2 in column 1)	0.1579	0.1420	0.1480

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Appendix B: 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 B1 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) 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) 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) 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) 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 B1: 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 B2: 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) Types and Attributes related to Impact Motives

The table lays out attribues of the LP investor types listed in the first column. Column 2 indicates whether the primary constituents of the capital are households (v. organization). Column 3 indicates whether the constituent capital is intermediated as opposed to directly invested by the constituent or an administrator (e.g., foundations and pensions). Column 4 indicates whether impact is a primary goal of the constituent. Column 5 identifies legal and political pressure to invest with impact. Finally, hte last two columns identify laws (e.g., ERISA) and charters (e.g., corporate charters) that restrict impact investment.

Limited Partner	Household	Intermediated	Mission	Pressure toward Impact	Laws Restricting Impact	Charters Restricting Impact
Development Organizations	--	--	yes	--	--	--
Foundations	--	--	yes	--	yes UPMIFA and PRI (U.S.)	--
Banks	--	--	--	yes Community Reinvestment Act (U.S.)	--	yes
Insurance	--	--	--	yes State regulation modeled after CRA (U.S.)	--	yes
Endowments	--	--	--	--	yes UPMIFA (U.S.)	--
Corporate & Government Portfolios	--	--	--	--	--	yes
Institutional Asset Managers	--	yes	--	--	--	yes
Wealth Managers	yes	yes	--	--	--	--
Private Pensions	yes	--	--	--	yes ERISA (U.S.)	yes (non-US)
Public Pensions	yes	--	--	yes Political pressure	yes State & National Laws	--

Table 2: 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 (measured at the time of each investment and averaged across all investments for a given LP). The % Prior Relationship is the percent of capital commitments where the LP and fund's general partner (GP) had a prior investment relationship. The % Home Bias is the percent of capital commitments by the LP type where the region of the LP and fund are the same (using the eight major global regions of Panel B). In Panel B, we present the regional distribution of LPs by LP type. Standard deviations are in parentheses.

	Dev. Org.	Found-ation	Bank	Insurance	Endow-ment	Corp. & Gov't	Institu-tional	Wealth Manager	Private Pension	Public Pension	Total
	Panel A: LP Descriptive Statistics										
# 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
# 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)	(18.65)
Vintage Year	2006.93	2005.44	2006.07	2004.79	2004.44	2006.46	2005.24	2005.77	2004.10	2004.38	2005.31
	(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)
# 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
% Prior Relationship	23.5	41.8	10.9	26.8	38.8	22.9	25.5	24.1	38.5	41.3	33.5
% Home Bias	59.0	78.2	82.1	82.4	81.9	71.9	61.1	68.8	78.2	84.4	75.7
	Panel B: Regional Distribution of LPs by LP Type										
North America	19	83	15	49	83	23	30	34	73	60	48
Developed Europe	29	15	40	33	15	27	42	38	20	31	29
Emerging Europe	6	0	3	0	0	1	1	2	1	0	1
Africa	5	0	4	3	1	1	3	1	1	2	2
Central and South America	6	0	1	1	1	2	1	1	3	2	2
Developed Asia-Pacific	8	1	15	6	0	19	9	18	2	3	8
Emerging Asia-Pacific	25	0	15	6	1	24	11	3	0	1	9
Middle East	3	1	7	2	0	2	5	3	1	1	2

Table 3: Fund Descriptive Statistics

This table presents fund summary statistics for all funds (left columns) and impact funds (right columns). Capital Commitment is the average capital commitment across investors within a fund. Past Fund Excess IRR is the weighted average (recent funds are weighted more than past funds) of the excess IRR for prior funds managed by the same fund family; excess IRR is a fund's IRR less the mean for similar cohort funds (year, region, and fund type). Past Fund Percentile Rank is a weighted average of percentile ranks for prior fund managed by the same fund family. Fund Excess IRR and Fund Percentile Rank are performance measures for the current fund. 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. 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.

	Traditional VC Funds				**Impact Funds**			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
	Panel A: Descriptive Statistics							
Vintage Year	4892	2004.14	2005.00	6.58	161	2006.51	2007.00	4.77
Fund Size ($mil)	4282	196.41	100.00	293.74	149	127.98	78.71	146.91
Capital Commitment ($mil)	3013	20.93	13.00	32.90	126	26.89	15.00	32.82
Past Fund Excess IRR (%)	1201	4.15	2.45	11.06	40	-0.49	1.39	7.91
Past Fund Percentile Rank	1319	0.54	0.56	0.22	52	0.42	0.42	0.23
Fund Excess IRR (%)	1450	1.08	0.00	15.19	76	-5.88	-4.50	12.00
Fund Percentile Rank	1815	0.49	0.50	0.30	95	0.34	0.28	0.30
First-time Fund	4892	0.34	0.00	0.48	161	0.38	0.00	0.49
Missing Performance Data	4892	0.38	0.00	0.49	161	0.30	0.00	0.46
	Panel B: Geography Focus of Fund Investments							
North America	4892	0.51			161	0.34		
Developed Europe	4892	0.23			161	0.17		
Emerging Europe	4892	0.06			161	0.09		
Africa	4892	0.02			161	0.23		
Central and South America	4892	0.02			161	0.12		
Developed Asia-Pacific	4892	0.07			161	0.01		
Emerging Asia-Pacific	4892	0.16			161	0.14		
Middle East	4892	0.03			161	0.00		
All Regions	4892	1.10			161	1.09		
	Panel C: Industry Focus of Fund Investments							
Business Services	4892	0.03			161	0.03		
Energy	4892	0.06			161	0.19		
Consumer Discretionary	4892	0.05			161	0.03		
Diversified	4892	0.28			161	0.49		
Industrials	4892	0.04			161	0.06		
Information Technology	4892	0.45			161	0.06		
Health Care	4892	0.22			161	0.06		
Infrastructure	4892	0.01			161	0.05		
Food and Agriculture	4892	0.01			161	0.04		
Materials	4892	0.00			161	0.04		
Real Estate	4892	0.00			161	0.04		
Media and Communications	4892	0.12			161	0.03		
All Industries	4892	1.28			161	1.12		

Table 4: The Effect of Impact on Investment Rate Probabilities

The two columns present marginal effects from a single 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 equals one for impact funds. 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 plus one. 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. The Tjur R^2 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 R^2 is calculated as the improvement in the Tjur R^2 from adding the indicated variables to the baseline model.

Group	Variable	Marginal Effects
Fund Attributes	Impact	0.00116***
		[0.000154]
	Past Fund Performance Rank	0.00117***
		[0.000195]
	Missing Performance Dummy	-0.000230*
		[0.000125]
	First Fund Dummy	-0.000510***
		[0.000129]
	Expected Fund Size	0.000676***
		[0.000222]
LP Attributes	Years in PE Investing	-0.000273***
		[0.0000394]
Fund Industry	Business Services	0.000972***
		[0.000147]
	Energy	0.000172
		[0.000120]
	Consumer	0.000314**
		[0.000127]
	Diversified	-0.000435***
		[0.0000941]
	Industrials	-0.000263*
		[0.000159]
	IT	-0.000050
		[0.000073]
	Health Care	0.000152**
		[0.000075]
	Infrastructure	0.000887***
		[0.000229]
	Food & Agriculture	0.000000
		[0.000295]
	Materials	-0.00114**
		[0.000448]
	Real Estate	0.00127***
		[0.000491]
	Media and Communications	-0.000105
		[0.0000814]
Relationship	Relation Dummy	0.0157***
		[0.000156]
Fund-LP Geography Match	North America	0.00520***
		[0.000101]
	Europe	0.00719***
		[0.000117]
	Developed Asia-Pacific	0.0117***
		[0.000243]
	Rest of World	0.0109***
		[0.000305]
	Emerging Asia-Pacific	0.00780***
		[0.000175]
Fund Geography	North America	-0.00241***
		[0.000216]
	Developed Europe	-0.00149***
		[0.000104]
	Developed Asia-Pacific	-0.00158***
		[0.000153]
	Rest of World	-0.000396***
		[0.000116]
	Emerging Asia-Pacific	0.000043
		[0.000099]
Vintage Year Fixed Effects		Yes
LP Investment Rate Fixed Effects		Yes
Observations		3,089,112
Tjur R2		0.1579

	Tjur Partial R2	Tjur Parital as % of Total Tjur
Fund Attributes	-0.00021	-0.20%
LP Attributes	0.00020	0.13%
Relationship	0.13410	87.56%
Fund Geography	0.00012	0.07%
Fund-LP Geography Match	0.01017	6.68%
Vintage Year	0.00173	1.15%
Fund Industry	0.00034	0.22%
LP Investment Group Effects	0.00671	4.39%

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 5: The Effect of Impact on Investment Rate Probabilities by Impact Category

The table presents marginal effects from logit models for the full sample (column 1, a single estimation with all the impact category interactions) and impact category subsamples (column 2, traditional funds and only impact funds with the row's impact category). 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 equals one for impact funds. Impact categories are determined by manual classification of promotion material of each fund. Impact funds can, and often do, have multiple impact categories. Estimations include all control variables from Table 4. Scaled marginal effects include the addition of the impact dummy logit marginal effect plus the category logit marginal effect, divided by the baseline investment rate for all funds (0.00823).

	Single Logit: Impact plus Cateogry Interactions	Seven Subsambles: Traditional Funds plus Row's Impact Funds
Impact Dummy	0.00034	
	[0.000467]	
Environmental Impact	0.000915**	0.00204***
	[0.000435]	[0.000249]
		obs = 3,014,438
Minority & Women Funding	0.000857*	0.00118***
	[0.000473]	[0.000394]
		obs = 2,992,514
Poverty Alleviation	0.00119**	0.00150***
	[0.000507]	[0.000230]
		obs = 3,024,220
Social Concerns	0.00126***	0.00247***
	[0.000351]	[0.000253]
		obs = 3,010,840
Social Infrastructure Development	0.000026	0.00167***
	[0.000388]	[0.000346]
		obs = 2,997,979
SME Funding	-0.00108***	0.000500**
	[0.000348]	[0.000251]
		obs = 3,023,922
Geography (non-poverty) Impact	-0.000175	0.000187
	[0.000506]	[0.000288]
		obs = 3,015,688
All Controls from Table 3	YES	YES
Observations	3,089,112	see above

	Combined Marginal Effect	p-value from z-test	Scaled Marginal Effect (%)	Scaled Marginal Effect (%)
Impact + Environmental Impact	0.001260	0.001***	15.3%	24.8%
Impact + Minority and Women	0.001201	0.008***	14.6%	14.3%
Impact + Poverty Alleviation	0.001535	0.000***	18.6%	18.2%
Impact + Social Concerns	0.001601	0.003***	19.4%	30.0%
Impact + Social Infrastructure	0.000370	0.558	--	20.3%
Impact + SME Funding	-0.000737	0.227	--	6.1%
Impact + Geography	0.000169	0.612	--	--

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 6: The Demand for Impact by UNPRI Signatories and Time

The table presents marginal effects from logit estimations. 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) present results with Impact only. Model (2) interacts Impact and UNPRI. Model (3) interacts Impact and a time dummy (prior to 2007 v. 2007 or later). Model (4) presents the triple interaction of impact, UNPRI signatory, and time. All lower order interactions are included in the estimation. Controls (fund attributes, LP attributes, and relationship variables) include all those reported in Table 4.

Model	(1)	(2)	(3)	(4)
Impact	0.00116***			
Standard Error	[0.000154]			
Scaled Marginal Effect	14.1%			
Nonsigner*Impact		0.000606***		
Standard Error		[0.000176]		
Scaled Marginal Effect		7.8%		
UNPRI*Impact		0.00296***		
Standard Error		[0.000292]		
Scaled Marginal Effect		25.8%		
Impact*Prior to 2007			0.000682***	
Standard Error			[0.000249]	
Scaled Marginal Effect			7.1%	
Impact*2007 and Later			0.00143***	
Standard Error			[0.000189]	
Scaled Marginal Effect			21.8%	
Nonsigner*Impact*Prior to 2007				0.000441
Standard Error				[0.000283]
Scaled Marginal Effect				4.9%
Nonsigner*Impact*2007 and Later				0.000639***
Standard Error				[0.000219]
Scaled Marginal Effect				10.1%
UNPRI*Impact*Prior to 2007				0.00152***
Standard Error				[0.000505]
Scaled Marginal Effect				11.1%
UNPRI*Impact*2007 and Later				0.00421***
Standard Error				[0.000373]
Scaled Marginal Effect				48.5%
Controls	YES	YES	YES	YES
UNPRI Fixed Effect	NO	YES	NO	NO
UNPRI*Pre, UNPRI*Post, Nonsigner*Post Effects	NO	NO	NO	YES
Vintage Year Fixed Effects	YES	YES	YES	YES
LP Investment Rate Fixed Effects	YES	YES	YES	YES
Observations	3,089,112	3,089,112	3,089,112	3,089,112

Robust Standard Errors are in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 7: The Demand for Impact by Investor Location

The table presents marginal effects from logit models. The data sample differs by columns according to the geography of the investor (LP). 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. Scaled effects divide marginal effects by baseline investment rates for all investor-funds in model (1) and conditional on UNPRI signatory status in model (2). Model (1) presents results with Impact only; model (2) interacts Impact and UNPRI. Control variables are those in the main logit model of Table 4.

	North America		Developed Europe		Developed Asia-Pacific		Emerging Asia-Pacific		Rest of World	
Variable	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Impact	0.000818***		0.00172***		-0.000103		-0.000444		0.000149	
Standard Error	[0.000263]		[0.000225]		[0.000606]		[0.000361]		[0.000108]	
Scaled Marginal Effect	8.5%		23.7%		--		--		--	
Nonsigner*Impact		0.000327		0.00122***		0.000041		-0.000438		0.000054
Standard Error		[0.000289]		[0.000272]		[0.000643]		[0.000361]		[0.000120]
Scaled Marginal Effect		--		18.8%		--		--		--
UNPRI*Impact		0.00306***		0.00266***		-0.000944		n.a.		0.000498**
Standard Error		[0.000562]		[0.000358]		[0.00171]				[0.000220]
Scaled Marginal Effect		18.3%		28.5%		--				10.8%
UNPRI		0.000272**		0.000077		0.000125		0.000629		0.000018
Standard Error		[0.000134]		[0.000127]		[0.000184]		[0.000705]		[0.000152]
Scaled Marginal Effect		2.8%		--		--		--		--
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
Total Capital Commitments	17,090	17,090	5,826	5,826	900	900	1,182	1,182	437	437
Commitments to Impact	371	371	353	353	9	9	22	22	73	73
Observations	1,802,258	1,802,258	801,294	801,294	167,742	167,742	228,064	227,994	89,238	89,238

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 8: The Demand for Impact by Investor Type

This table presents the estimation results of our main logit model by investor (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 logit model. Scaled effects divide marginal effects by baseline investment rates for each LP type. Impact equals one for impact funds. Controls include all variables from the main logit model presented in Table 4.

	Dev. Org.	Foundation	Bank	Insurance	Endowment	Corp. & Gov't	Institutional	Wealth Manager	Private Pension	Public Pension
Impact										
Coefficient	0.00142***	0.000809**	0.00101***	0.00171***	-0.00225***	-0.000303	-0.000463	0.000152	-0.000707	0.00199***
Standard error	[0.000228]	[0.000409]	[0.000254]	[0.000437]	[0.000839]	[0.000497]	[0.000534]	[0.000597]	[0.000564]	[0.000358]
Scaled Marginal Effect	17.7%	11.1%	22.2%	24.0%	-31.1%	--	--	--	--	17.3%
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	395,606	147,497	271,168	187,812	228,724	445,153	126,202	452,592	557,650

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 9: LP Attributes and the Demand for Impact

The table presents marginal effects from a single 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. The key independent variables are an impact dummy (equals one for impact funds) and the interaction of impact and investor attributes (household, intermediated, mission, pressure, laws, charter). Estimations include all control variables from Table 4. Scaled marginal effects include the addition of the impact dummy logit marginal effect plus the interaction of impact with the investor attribute, divided by the baseline investment rate for investors with the attribute.

	Logit Estimation with Invested Dependent Variable
Impact Dummy	-0.000863
	[0.000902]
Household*Impact	0.00216***
	[0.000662]
Intermediated*Impact	-0.000328
	[0.000513]
Mission*Impact	0.00387***
	[0.000878]
Pressure*Impact	0.00364***
	[0.000400]
Laws*Impact	-0.00317***
	[0.000514]
Charter*Impact	0.000996
	[0.000800]
All Controls from Table 3	YES
Vintage Year Fixed Effects	YES
LP Investment Rate Fixed Effects	YES
Observations	3,089,112

	Combined Marginal Effect	p-value from z-test	Scaled Marginal Effect (%)	Implied effect on the demand for impact (in # of LP investments)	Implied effect (as % of actual impact investments)
Impact + Household*Impact	0.001299	0.027**	13.1%	51.63	6%
Impact + Intermediated Impact	-0.001191	0.000***	-16.2%	-23.80	-3%
Impact + Mission*Impact	0.003010	0.000***	39.5%	76.72	9%
Impact + Pressure*Impact	0.002780	0.001***	26.1%	71.47	9%
Impact + Laws*Impact	-0.004035	0.000***	-41.8%	-205.21	-25%
Impact + Charter*Impact	0.001325	0.711	--	--	

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table 10: LP Attributes, Home Bias, and the Demand for Impact

The table presents marginal effects from a single 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. The key independent variables are impact (equals one for impact funds), homebias (equals one if the investor and fund are in the same region), and investor attribute dummy variables (household, intermediated, mission, pressure, laws, and charter). Estimations include all control variables from Table 4 plus the direct effects of investor attributes. The first column of numbers presents the direct effect of impact, direct effect of homebias, and the interaction of investor attributes and impact. The second column presents the triple interaction of investor attribute, impact, and homebias.

Impact	-0.00112		
	[0.000941]		
Homebias	0.00686***		
	[0.000071]		
Household*Impact	-0.000783	Household*Impact*HomeBias	0.00410***
	[0.00111]		[0.00108]
Intermediated*Impact	-0.000059	Intermediated*Impact*Homebias	-0.000407
	[0.000802]		[0.000970]
Mission*Impact	0.00520***	Mission*Impact*Homebias	-0.00205***
	[0.000973]		[0.000607]
Pressure*Impact	0.000338	Pressure*Impact*Homebias	0.00389***
	[0.00105]		[0.00112]
Laws*Impact	-0.00345***	Laws*Impact*Homebias	0.000511
	[0.000745]		[0.000930]
Charter*Impact	0.000653	Charter*Impact*Homebias	0.000928
	[0.000997]		[0.000668]

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

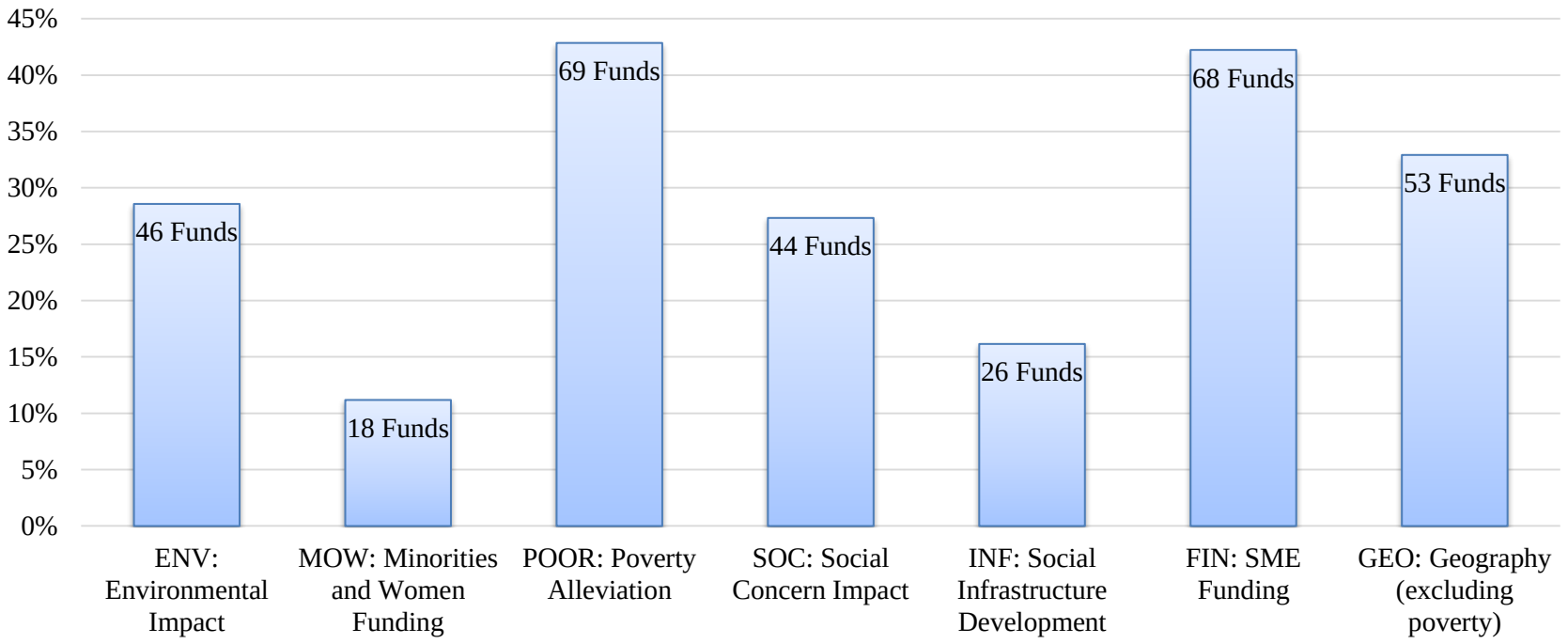

Figure 1: Distribution of Impact Categories that Impact Funds Target

For the sample of impact funds, we identify the impact categories targeted by each impact fund. The figure presents the percentage of sample funds that target each category. The numbers in the bars reflect counts of funds. Funds can have multiple impact categories. The categories are as follows:

Environmental Impact, delivers positive environmental impact (e.g., agriculture, energy, water, and forestry)

Minorities and Women Funding, funds firms run by minorities or women

Poverty Alleviation, funds firms in impoverished areas

Social Concern Impact, addresses social concerns or measures the social impact of its investments

Social Infrastructure Development, develops infrastructure for societal benefit (e.g., microfinance, health care, schools, and housing)

SME Funding, provides capital to SMEs and undercapitalized markets

Geography (excluding poverty), imposes a material geographic constraint on its investment criteria but is not focused on poverty alleviation

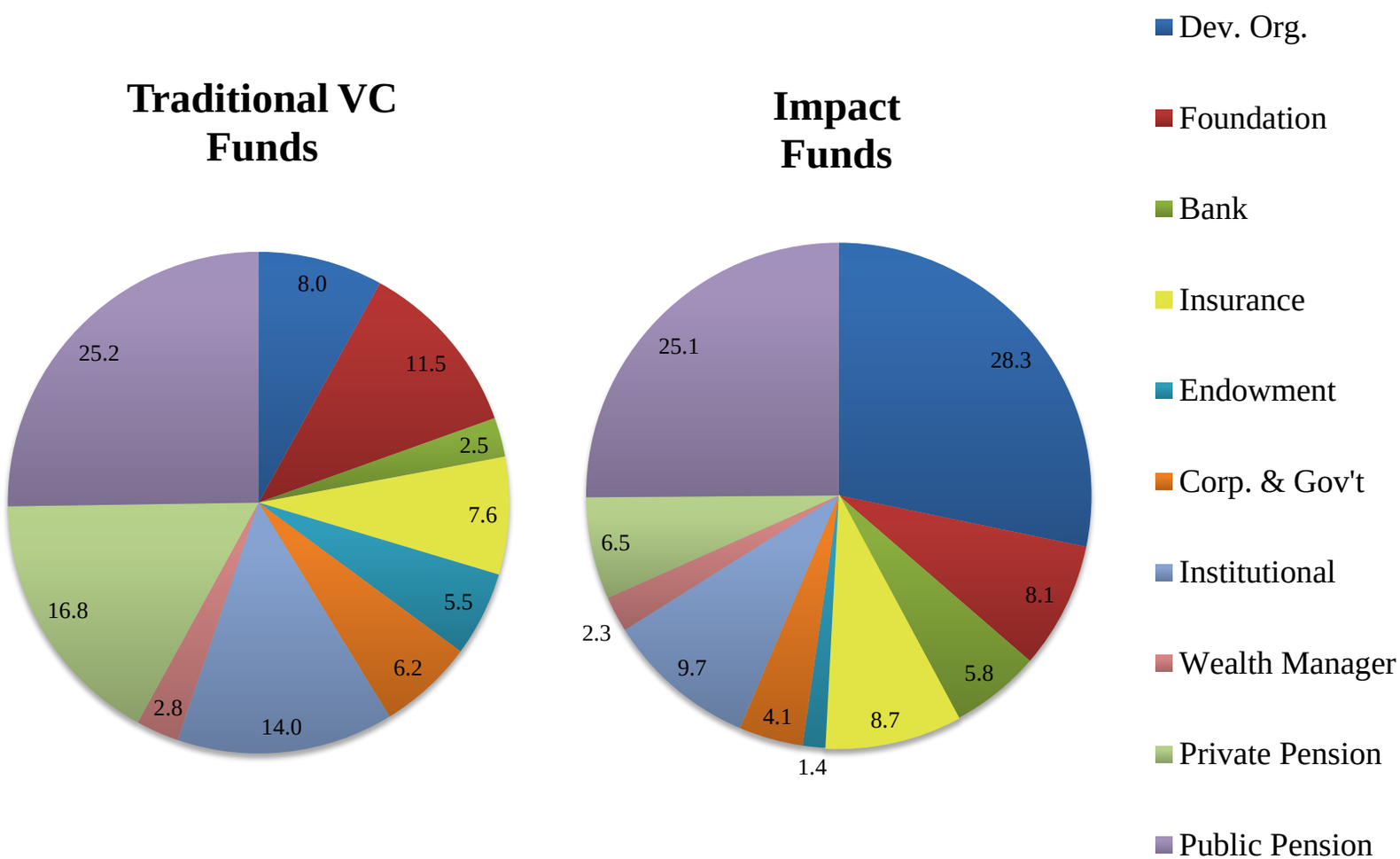

Figure 2: Investor Type Market Share for Investments in Traditional VC Funds v. Impact Funds