The Accredited Investor Definition, Private Investments, and Wealth Inequality in the US*

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Abstract

I study household finances around the income eligibility rules of the accredited investor definition that allow only high-income households access to private investments. Such investments have recently been linked to higher returns and the increase in wealth inequality. My analysis shows that access to private markets increases private investments. The result provides an answer to an important question in the literature and in politics: differences in private investments are not only caused by differences in abilities and tastes between wealthy and poor households, but also simply by access to private investments. Moreover, I find discontinuities in wealth and returns. Eligible households exhibit relative increases in the private investments to assets ratio, net wealth, and returns by 6.2pp, 39%, and 1.0pp, respectively. A back-of-the-envelope calculation suggests that the accredited investor definition can explain important parts of recent increases in wealth inequality.

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1. Introduction

Wealth inequality has increased rapidly in the US, and the potential causes are a matter of much debate. Recent studies identify heterogeneous returns across households as the prime reason for the increase in wealth inequality. Specifically, wealthy households earn higher returns than poor households, not only but in particular through their investments in private businesses. Whether differences in private investments are entirely because of differences in abilities and tastes between wealthy and poor households or partly because of access restrictions for poor households is a subject of much discussion. Some argue that the differences are mainly due to differences in management skills and tolerance for risk and illiquidity. Others argue that participation constraints may prevent some able but poor households from investing in private businesses.[1]

At the same time, there is a heated debate in capital markets regulation that has so far received little attention from the wealth inequality literature. For decades, the US capital markets are hallmarked by a decreasing number of IPOs and publicly listed firms, while on the other hand private markets are growing rapidly. As a consequence, the accredited investor definition has moved into the center of the discussion, a rule that strictly defines access to private investments based on certain income and wealth thresholds and thus allows private market participation only for wealthy individuals. Similar to the wealth inequality debate, the discussion is whether poorer households miss out valuable investment opportunities. While some argue that poor households are not capable and interested in participating in private markets, others argue that the rule prevents some households from better returns and diversifying opportunities and moreover from entrepreneurial investments such as angel investments. The accredited investor definition is one of the top priorities on the SEC's rulemaking agenda and since years subject to various reform proposals (e.g., SEC, 2023).

This paper helps to fill the gaps in the literature by studying household finances around the income eligibility rules of the accredited investor definition. The accredited investor definition provides access to private investments for households with an income above a certain threshold, specifically, $200,000 individually or $300,000 jointly with the partner. A comparison of households with income just below and just above the eligibility thresholds allows for a regression discontinuity design that controls for differences in skills and tastes and enables a direct estimate

[1] For the wealth inequality literature, see, e.g., Piketty (2014), Gabaix et al. (2016), Saez and Zucman (2016), Bach, Calvet, and Sodini (2020), Fagereng et al. (2020), Xavier (2021), and Smith, Zidar, and Zwick (2022).

of access to private investments. The analysis benefits significantly from the availability of detailed household-level data coming from the Survey of Consumer Finances. The data include various information on income, wealth and investments, and household characteristics. To the best of my knowledge, this is the first paper that studies an exogenous variable of access to private investments and examines household finances around the accredited investor definition.

My analysis shows that access to private markets increases the private investments to assets ratio by 6.2 percentage points. The result provides an answer to the discussions in the literature and politics: differences in private investments are not only caused by differences in abilities and tastes between wealthy and poor households, but also simply by access to private investments. Private business investments can be passive or active. The distinction is important to understand whether access to private markets restricts passive retail investments such as VC or PE investments or active entrepreneurial investments such as angel investments. I find increases in both. Economically, passive investments account for about 10% of the overall increase in private investments and active investments for about 90%.

Next, I find discontinuities in net wealth. The effect is sizable: eligible households exhibit a relative increase in net wealth by 39%. Further analysis shows that most of the increase comes directly from an increase in the unrealized capital gains and income components of private investments. In a back-of-the-envelope calculation, I find that the accredited investor definition can explain important parts of recent increases in wealth inequality. For example, I find that the rule can explain up to 28% of the 10 percentage point increase of the top 5% wealth shares from 2003 to 2013.

I proceed by estimating household returns and analyzing potential sources through which the higher returns from private investments come from. The estimated annual return to assets increases by 1.0 percentage points, which represents a 20% increase. Regarding the sources, it is important to note that I look at realized returns. As such, parts of the higher returns should simply present a compensation effect for more risk, illiquidity, and management efforts related to private investments. For example, I find that the increase in net wealth is stronger for households that rather have actively managed investments compared to households that rather have passive investments. Notably, while some households may just be indifferent and thus do not achieve value by private investments, others may benefit by their heterogeneity in the compensation factors. Other parts of the higher returns may come from higher adjusted returns, consistent with a

widespread view that private markets offer excess returns compared to public markets. Supporting this, I find that eligible households have better risk-adjusted returns, on the one hand because of a diversification effect between public and private markets and on the other hand because of an outperformance of private investments. I argue that rent-extraction may arise naturally because the accredited investor definition restricts the private markets.

My paper contributes to the debate on the causes for the recent increase in wealth inequality. I find that differences in private investments and wealth accumulation are not only caused by differences in abilities and tastes between wealthy and poor households, but also simply by a rule that determines access to private investments, namely, the accredited investor definition. The rule can explain important parts of recent increases in wealth inequality. It is worth noting that similar participations rules also exist in many other countries such as the UK, Canada, and the EU (SEC, 2015).

My paper contributes to the SEC's rule making activity on the accredited investor definition. The rule was introduced in the light of the SEC's mandate of promoting capital formation while ensuring investor protection, using the income and worth tests as proxies for financial literacy. Currently, the SEC is discussing possible changes to the law that range from its complete repeal to an inflation adjustment of the thresholds from now on to an inflation adjustment from 1982 onwards (SEC, 2023). My findings show that the income thresholds prevented many households from optimal behavior and wealth accumulation. From a perspective that neglects potential differences in financial literacy between high- and low-income households, my findings suggest abolishing the law. From a perspective that considers potential differences in financial literacy, my findings have other implications. First, they suggest allowing access to private markets to all households that have sufficient financial knowledge, thereby supporting the 2020 amendment that permits access based on knowledge tests. Second, they suggest rejecting the current proposal to adjust the thresholds regarding 1982, given that such a rule would have restricted obviously capable households in my sample period from wealth accumulation. Third, they enable a more optimal rule setting. For example, I find that during my sample period households with an income of up to $100,000 less than the existing thresholds have similar financial literacy as eligible households, suggesting updated optimal eligibility thresholds that could serve as a starting point for future inflation adjustments.

Finally, my paper contributes to the finance literature concerned with measuring private equity performance. Essentially, the literature is characterized by comparing risk-adjusted returns between private and public equity, with strikingly mixed results that are caused by various measurement problems. I contribute by suggesting a different approach for evaluating private equity returns: looking at the household level and comparing households with and without access to private equity. The approach offers several complementary and novel results. My finding that higher private equity returns are partly a compensation effect for management efforts provides additional evidence to those coming from relatively few studies (e.g., Korteweg and Nagel, 2016). My finding that households start investing in private equity if they are allowed to suggests that households value private investments, raising doubts on conclusions that private equity does not provide additional value and demands for sources of this value. Sources might be that households are primarily interested in absolute returns and do not give as much weight on risk and other compensation factors as previously assumed (Gompers, Kaplan, and Mukharlyamov, 2016; Korteweg, 2019), or that some households achieve value by their heterogeneity in the compensation factors. Additionally, my study shows that eligible households exhibit better risk-adjusted returns, achieved partly from an outperformance of private equity and partly from a diversification effect between public and private markets. I discuss that excess returns may naturally arise because the accredited investor definition restricts the private market.

The remainder of the paper proceeds as follows. Section 2 provides information on the accredited investor definition, the empirical strategy, and the data. Section 3 presents the findings. Section 4 discusses policy implications of the findings. Section 5 concludes.

2. Accredited investor definition, empirical strategy, and data

2.1. Accredited investor definition

In the US, the accredited investor definition determines which investors are eligible to participate in private markets. Specifically, under the time period of this paper (2013–2019), individuals qualify as accredited investors based on the following income and wealth thresholds: (1) income over $200,000 individually or $300,000 with partner, in each of the prior two years and reasonable

expectation of reaching the same income for the current year; or (2) net worth over $1 million (individually or with partner), excluding the value of the primary residence.[2]

The accredited investor definition was introduced in 1982, as part of the adaption of Regulation D. Regulation D was designed to expand the availability of private offerings and provides a number of exemptions from the registration requirements that involve comprehensive disclosure. Recognizing the potential risks associated with unregistered offerings, and in line with its mandate of promoting capital formation while ensuring investor protection, the SEC implemented the income and wealth tests of the accredited investor definition as measures of the extent to which investors have the financial sophistication, ability to sustain the potential losses, and access to information that have been associated with an ability to fend for themselves. The accredited investor definition has been a fundamental component of Regulation D since its introduction.[3]

Regulation D is the most widely used set of exemptions of securities offerings and includes essentially all relevant household investments in private businesses, such as investments in venture or private equity funds or direct angel investments in start-ups. For example, $1.56 trillion of relevant capital was raised in unregistered offerings in 2019, with Regulation D virtually accounting for all of the capital (SEC, 2020).[4] Given that the accredited investor definition falls under the federal law, it applies to all American households. Verification of the accreditation status typically occurs at the investment fund, issuing firm, or angel club by providing a proof of the financial situation or signing a self-verification statement. For each new participation in the private markets, investors must fulfill the accreditation status again.

A key feature of the accredited investor definition is that the income and wealth thresholds have not been inflation adjusted since their introduction. This allows to define a pool of investors that

[2] Unless otherwise specified, most of the information in this section can be found at SEC (2015, 2019, 2020, 2023) and the SEC website regarding offering pathways (here).

[3] Regulation D consists of Rule 506 unlimited offerings that require accreditation, and Rule 504 limited offerings that do not require accreditation. However, the later offering type is rather for investors with whom the company has a relationship. For 2019, over 99.9% of capital raised in Regulation D offerings come from Rule 506 (SEC, 2020). For 2009–2022, about 99.7% of investors that participated in Regulation D offerings were accredited investors (SEC, 2023).

[4] The total amount raised in private markets in 2019 is $2.726 trillion. This includes $1.558 trillion by Regulation D and $0.001 trillion by Regulation A and Regulation Crowdfunding, as well as $1.167 trillion by Regulation S and Rule 144A (SEC, 2020). Regulation Crowdfunding allows small firms to raise capital from accredited and non-accredited investors online and Regulation A, sometimes called mini-IPO, allows SMEs to raise capital from investors through a process similar to, but less extensive than, a registered offering (both Regulation Crowdfunding and Regulation A impose capital raising limits for the firm and investment limits for non-accredited investors). Regulation S is for offers and sales of securities outside of the US and Rule 144A is for the resell of private securities to institutional buyers.

are accredited and non-accredited, and moreover allows for changes in the composition of the accredited investor pool over time that can be used as valuable robustness tests (e.g., households that earn $200,000 in 2013 typically have different characteristics than households that earn the same amount in 2019). Some other changes have been made over time, but these changes have no major impact on my analysis. Regarding the accredited investor definition, e.g., in 1988, the $300,000 joint income test was added; in 2011, the $1 million net worth test was amended by excluding the value of the investor's primary residence; and, in 2020, an additional criterion to the financial tests was introduced under which individuals can qualify by financial sophistication tests. Regarding private offerings other than Regulation D, e.g., in 2015 and 2020, the offering amount in Regulation A was extended from $5 million to $50 and $75 million; and, in 2016, Regulation Crowdfunding was introduced.

The accredited investor definition has recently become the focus of interest. For decades, the US public markets are characterized by a decreasing number of IPOs and listed firms, while on the other side private markets are flourishing (e.g., Doidge, Karolyi, and Stulz, 2017; Hanley, 2017). For example, while Regulation D and public markets already raised the same amount of $1.3 trillion in 2014, Regulation D raised $2.4 trillion and private markets only $1 trillion in 2022 (SEC 2015, 2023). Against this background, several commentators have argued that the accredited investor definition creates inequality by preventing poor households from better return and diversifying opportunities and moreover leaving poor households with already skimmed returns. Additionally, it has been argued that the rule prevents poor households from exploiting their entrepreneurial talent, e.g., by angel investments. On the other side, commentators suggest that poor households are typically unable and not interested in private markets, and further argue that the rule should actually be adjusted for inflation to ensure investor protection. The accredited investor definition is one of the top priorities on the SEC's rulemaking agenda (here) and since years subject to different reform proposals (e.g., SEC, 2023).

2.2. Empirical strategy

My empirical strategy for identifying the effect of access to private business investments is to study household finances around the income eligibility rules of the accredited investor definition. A comparison of households with income just below and just above the eligibility thresholds allows for a regression discontinuity design that controls for differences in skills and tastes and enables a

direct estimate of access to private businesses. More specifically, households just below the eligibility cutoff serve as a control group that have similar characteristics as households just above the cutoff with the only difference between the two groups that households above the cutoff have improved access to private business investments.

Note that income is typically roughly stable over time. As such, households above the cutoff achieved improved access to private businesses at different points in time. For example, some households such as young and low net worth households achieved access through the income test just recently while their counterpart has no access to private investments. Other households such as old and high net worth households achieved access through the income test a couple of years ago while their counterpart may now be eligible via the net worth test but was restricted in the previous years. This is also the reason why I will use a sharp RD design and not a fuzzy one. A fuzzy RD design would rescale the estimates by the number of households that are currently restricted and thus would lead to inflated estimates by ignoring households that were affected in earlier points in time. In contrast, a sharp RD assumes that all households are affected and thus presents conservative estimates.[5]

A problem in estimating the effect is that married households can qualify either individually or jointly under the income test. In the available data, we cannot distinguish between the incomes of the partners and as a result it is not possible to define a precise threshold. I deal with this problem by defining the threshold by the earliest eligible income of $200,000, plus the average wage of a partner around this income level (here, all the income except the partner's wage is assigned to the household head). At this point, there should be a discontinuous increase in the number of households that have access to private businesses. As such, I set the threshold for couples at $240,000, with the average wage of a partner based on an income level between $200,000–$300,000 in 2013.[6] Note that incorrectly setting the threshold only leads to a downward bias of the results. Put differently, incorrectly setting the threshold can eliminate existing jumps, but cannot produce jumps. In Section 3.4.2, I will present several findings that further mitigate potential concerns, such as similar results when looking only at single households, discontinuities when

[5] It might be that the sharp RD design is too restrictive, e.g., when households above the threshold first gained access by the net wealth test, and only later experienced an increase in income.

[6] I round the average wage of the partner to the nearest five thousand for simplicity. I use 2013 to calculate the average wage because wage increase over time and calculating the average based on all years may exclude affected households in 2013. My results are not sensitive to these choices (see Section 3.4.).

comparing couples with an income below $200,000 and above, stronger results when further refining the threshold using individual partner wage (as opposed to the average across households), and exploiting changes in the average wage of a partner across years. To look at the problem from a more positive perspective, the fact that single and married households have different threshold values allows for valuable additional robustness tests.

Specifically, I estimate the following sharp regression discontinuity design:

$$Y_i = \beta_0 + \beta_1 1(I_i \geq \tau) + f(I_i - \tau) + \beta_2 X_i + \epsilon_i, \quad (1)$$

where Y_i is the dependent variable; i indexes households; $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise; $(I_i - \tau)$ accounts for the effect of the income on the dependent variable in the following way $f(\cdot)$; X_i are household characteristics that are possible determinants of the dependent variable; and ϵ_i is the error term. The coefficient of interest is β_1, which measures the change in the dependent variable of households above the threshold relative to households below the threshold (the RD estimate). Standard errors are robust.

My analysis is based on a bandwidth of $100,000. Including households away from the threshold has the benefit of increased statistical properties, while the cost is a bias when the functional form is not correctly specified. The Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth that trades off these benefits and costs is about $98,000 for private investments as the dependent variable. For simplicity, I round this value and use the same value for all dependent variables. Finally, $f(\cdot)$ presents a linear fit at each side of the cutoff. I use a linear function based on the graphical observation that variables around the cutoff mostly run in a linear way. My findings are not sensitive to different bandwidths (in a reasonable range) or functional forms.

2.3. Data

The data source is the Survey of Consumer Finances (SCF), a central database for research regarding household finances in the US. The data include household-level micro information on income, wealth and investments, and household demographics. The survey oversamples high-income households (identified by income tax information), thereby accounting for the lower response rate of wealthy households and allowing for a representative study of the entire US

population. Given that my analysis relies on data for households in top of the income distribution, the oversampling enables a sufficient number of observations for these households.

The SCF is conducted every three years from 1989–2022. I use the survey waves of 2013, 2016, and 2019 for my analysis. I do not consider the waves of 2010 and 2022 because these years may be directly affected by the 2007–2009 financial crisis and the Covid-19 crisis, and I do not consider earlier years because there accreditation rarely occurred by the income tests and more by the wealth tests (leading to limited observations). For each household, the survey provides five imputations to account for missing variables. I use all of these imputations and correct standard errors according to the SCF suggestion (multiplying the errors by the square root of five). My findings are not sensitive to different approaches such as using the average of the imputations. All nominal values are inflation-adjusted to 2022 dollars, while the thresholds are based on the actual dollar value in the specific year. I winsorize all variables at the 0.5 and 99.5 percentiles to account for outliers. The final sample consists of 12,649 imputations for the applied bandwidth. Table A.1 in the Appendix presents detailed variable definitions.

Survey data are typically subject to a selection bias problem. A concern in my study is that households above the threshold may have a different response rate than households below the threshold, with the response decision being related to private investments and net wealth. One example is that surveys are time-consuming and that households participating in private markets have less time by entrepreneurial investments (note that this should actually lead to a downward bias of the results). While it is not possible to exclude the possibility of a selection bias problem, empirically we should see a disproportional change in the number of households above the threshold if this is the case. In Section 3.4.1. below, I will show that the density appears continuous around the threshold.

Table 1 presents some statistics around the accredited investor definition. As shown, about 8.5% of the US households qualified as accredited in 2013. On the other side, the law was binding for 91.5% or 112 million American households. Given that the thresholds are not inflation adjusted, the share of accredited households increased over time, with 10.4% in 2016 and 11.3% in 2019. The table also shows that both accredited and non-accredited households hold a considerable share of the total net wealth. The remaining statistics are on households that qualify by the income test and by the wealth test.

3. Results

This section presents the main results. The nominal dependent variables are based on dollar values rather than logs, given that many variables can take on negative values.

3.1. Effect on private investments

3.1.1. Effect

Panel A of Figure 1 shows private business investments. Besides investments by investors, the variable also includes investments by self-employed households. Each dot is the average value for households in income bins of $30,000. The figure shows investments for households in an income range of $150,000 around the thresholds. The lines show fitted values based on a quadratic fit for each side of the cutoff.

As can be seen, there is a discontinues increase in private investments after the threshold. Private investments are about twice as much for households just above the threshold compared to households just below the threshold. It might be helpful to provide some notes before proceeding. First, as discussed, eligible households may have just qualified but may have also been there for many years. For example, eligible households can have net wealth of few thousand dollars but also of serval million dollars. Second, private investments can indicate the investment amount, but also the outcome of the investment after several years of holding. Third, private investments before the cutoff can be explained by self-employed investments or eligibility through the net wealth test, while we are interested in the additional increase that should come from investments by investors and through the income test. Finally, observations become less and less for high amounts of income, possibly leading to increased variation.

Columns 1–2 of Table 2 present the corresponding RD estimates. Column 1 shows the estimates without controls and column 2 shows the estimates after controlling for age, education, number of kids, race, home ownership, marriage status, willingness to take financial risk, and financial literacy. The columns show that households above the threshold exhibit an increase in private investments relative to households below the threshold. Column 2 shows that households above the threshold exhibit a relative increase in private investments by $804k, which implies an increase of $804k / $442k = 182% based on the average value of households below the threshold.

Panel B of Figure 1 and columns 3–4 of Table 2 repeat the analysis for the ratio of private investments to assets as dependent variable and confirm the findings. Column 4 shows that the ratio increases by 6.2 percentage points. Note that the ratio tends to reduce the effect, given that assets as the denominator may also increase with increases in private business wealth (see below).

Overall, the findings provide an answer to the discussions in the literature and politics: differences in private investments are not only caused by differences in abilities and tastes between wealthy and poor households, but also simply by access to private markets determined by the accredited investor definition.

3.1.2. Passive and active private investments

Private investments can be passive or active. The distinction is important to understand whether access to private investments restricts passive retail investments such as VC or PE investments or active entrepreneurial investments such as angel investments.

The SCF includes questions that provide insights into whether the respondent's level of involvement is active or passive. Specifically, the survey asks "Do you (or anyone in your family living here) have an active management role in any of these businesses?" and "[virtually the same as above] not have an active management role?". The latter question should indicate passive investments, mainly like VC and PE investments (and partly also passive start-up investments). The former question should indicate active investments, mainly like active angel investments in start-ups (and partly also other active direct investments).

Figure 2 shows active and passive investments. As shown, there is a discontinuous increase in both. Columns 1–4 of Table 3 show the corresponding RD estimates. Column 2 shows that active investments increase by $689k, and column 4 shows that passive investments increase by $48k. Regarding the overall increase in private investments, active investments account for $689k / $804k ≈ 86%–90% of the increase, while passive investments account for $48k / $804k ≈ 6%–10%. Note that active and passive investments do not fully add up to private investments due to separate winsorization of the variables.

An interesting question is whether passive investments are only undertaking by active (experienced) investors or whether they are relevant for the common retail investor. In columns 5–6 of Table 3, I exclude all households that have active investments (note that this also excludes

households that are no active investors but common self-employed persons). As shown, passive investments increase among retail investors.

Appendix A.1 provides several helpful discussions on the results of this subsection. The discussions include the need of accreditation for angel investors, the active management role of angels in start-ups, the market sizes of VC and PE funds and angel investments regarding households, and additional evidence on whether the observed increase in active investments comes from investments by investors (rather than investments by self-employed founders).

3.2. Effect on net wealth

3.2.1. Effect

Next, I study whether the increase in private investments has an effect on net wealth. Panel A of Figure 3 depicts net wealth. As can be seen, there is a discontinues increase in net wealth around the accredited investor definition.

Columns 1 and 2 of Table 4 show the RD estimates and confirm the increase. The economic effect is sizable: column 2 shows that eligible households exhibit an increase in net wealth by \$1,082k / 2,766k = 39%. Columns 3 and 4 additionally report the results for assets and show that assets increase by 35%.

If the increase in net wealth is caused by an increase in private investments, we should see an increase in the unrealized capital gains and income components of private investments that directly translate into net wealth. Panels B and C of Figure 3 respectively present unrealized capital gains and income from private businesses. There is a discontinuous increase in both. Columns 5–8 of Table 4 present the RD estimates. The results show that private unrealized capital gains increase by \$498k and private income by \$13k (although statistically insignificant). Note that while unrealized capital gains typically sum up over years, income is for a single year; for an ongoing investment over 10 years, income increases by \$130k. The components can thus directly explain about \$628k / 1,082k = 58% of the observed increase in net wealth. The remaining part should be explained from the proceeds of previous private investments that were distributed across different assets.[7]

[7] For example, Table 6 below shows that there is no difference in direct stock holdings and the associated unrealized capital gains and dividend income components between eligible and non-eligible households. Assuming that in a certain point of time eligible households invested in private firms rather than in stocks, the result suggests that proceeds of private investments were partly distributed into stocks.

3.2.2. The accredited investor definition and wealth inequality

The literature suggests that heterogeneous returns explain most of the recent increase in wealth inequality. Heterogeneous returns come from differences in abilities and tastes. Yet, the results above show that they also partly come from the accredited investor definition. A question is how much of recent increases in wealth inequality can be explained by the accredited investor definition?

Saez and Zucman (2016) show that, e.g., the top 5% wealth shares (that are roughly all accredited households) increased from 55% to 65% from 2003 to 2013. A back-of-the envelope analysis can give a rough idea about the importance of the accredited investor definition. First note that the documented increase in net wealth of 39% is a local estimate that compares households around the threshold, and can be marginal when looking at households with lower income. Panel A of Figure 4 depicts the ratio of private investments to assets for an extended income range and shows that private investments decrease with lower income. A reasonable assumption may be that only households just below the threshold are restricted, that is, households with an income up to $100,000 less the cutoff. In unreported results, I find that for 2013 these households account for about 31% of the total net wealth of households that have an income below the threshold. Under this assumption, the accredited investor definition can explain as much as 0.55 – [55 / (55 + 45*0.69 + 45*0.31*1.39)] = 2.8 percentage points, or 2.8 / 10 = 28% of the increase in wealth inequality. The rest is by heterogeneous returns through differences in tastes and abilities.

Alternative evidence on the role of the accredited investor definition comes from Panel B of Figure 4, which shows net wealth of households for an extended income range. Theoretically, heterogeneous returns through abilities and tastes should lead to an exponential increase in net wealth, rather than a linear one. The figure shows that while there is some exponential increase in net wealth, the increase also appears partly linear across many income levels. This suggests an important role of the accredited investor definition.

3.3. Estimated returns

3.3.1. Effect

Next, I estimate the effect of increased private investments on household returns. For simplicity, I only consider streams from private investments and direct stock holdings. These two variables should be the main options when households decide how to invest in risky capital.

I estimate returns in the following way. I assume that each household has held the current investment for 10 years. Then, the portfolio's compounded stream = (private income + public dividends)*10 + (private unrealized gains + public unrealized gains). To get the initial assets, I discount the assets by 1.050^{10}, based on Xavier (2021, Figure 3) who show that the average annual return on assets for US households for the 70-97% wealth percentiles is about 5.0%. For eligible households, I additionally discount the assets by 1.35, given that assets for these households increased by 35% (see columns 3–4 of Table 4) and I assume that this would not have been the case without access to private investments. Finally, the annualized return = [(compounded stream + discounted assets) / discounted assets]$^{1/10}$ – 1.

Panel A of Figure 5 depicts the estimated returns. As shown, eligible households exhibit a discontinuous increase in returns. Notably, although my analysis is based on a simple calculation, my estimates are very similar to those of Xavier (2021, Figure 3), who finds that returns are relatively stable across the first 90% percentiles of the wealth distribution, jump by roughly 1.2 percentage points for the 90–95% percentiles, and increase across the remaining percentiles. Table 5 shows the corresponding RD estimates. The returns increase by 1.0 percentage points, or 1.0 / 5.0 = 20% based on an average return to assets of 5%.

For robustness, in unreported results, I also estimate the returns when including other assets such as pension funds, real estate other than the primary residence, and debt.[8] The results are unchanged.

3.3.2. Sources of the higher returns from private investments

An important question is through which sources the higher returns from private investments come from. It is essential to note that my study is based on realized returns. As such, parts of the higher returns should simply present a compensation effect for more risk, illiquidity, and management efforts related to private investments. In other words, the observed increase in net wealth is a mechanic effect. In unreported results, I examine compensation for management efforts by studying whether the increase in net wealth is stronger for households that have actively managed investments compared to households that rather have passive investments (i.e., households without

[8] The compounded stream for retirement funds and real estate = current value / 2 * 0.1 * 10, assuming a 10% annual return on the average amount over ten years. The stream for debt payments is = current value * 0.027 * 10, assuming an annual interest rate payment of 2.7% (Xavier, 2021, Table 3) over ten years.

active investments). I find that the percentage increase in net wealth is 10 percentage points larger among households with active investments compared to households without active investments.

Notably, in the context of a compensation effect, some households may just be indifferent and thus do not achieve value by private investments (they receive more money but also "pay" for it). Yet, other households may benefit by their heterogeneity in the compensation factors. An example may be a household that receives compensation for risk, illiquidity, and management efforts, but has no personal discount for these factors. Heterogeneity seems to be a particularly powerful source to explain the rise in private markets.

Other parts of the higher returns may come from higher adjusted returns, consistent with a widespread view that private markets offer excess returns compared to public markets. In Panel B of Figure 5, I study risk-adjusted returns (returns over standard deviation of returns). As shown, there is discontinuities increase, suggesting that access to private markets allows households to earn better returns after accounting for risk. To understand where the increase comes from, in unreported results, I calculate risk-adjusted returns only for private investments and only for stocks among households that are just eligible (and can thus invest in both). I find that while stocks have risk-adjusted returns of 0.60, private investments have risk-adjusted returns of 0.72, suggesting that private investments outperform public investments. A portfolio of both private and public equity has the best return of 0.89 (see the figure), suggesting an additional diversification effect between private and public markets. Note, however, that the returns are only adjusted for risk, but not for illiquidity and management efforts.

A question is, if private markets offer excess returns, why do private and public markets do not equilibrate? An intuitive explanation may be that rent-extraction can naturally arise because the accredited investor definition constraints the private markets. A first look at anecdotal evidence suggests a highly constrained private market, with a lot of bargaining power for investors and very little for firms. For example, only about 10–25% of start-ups are accepted to pitch in an angel club (here), and less than 5% of those who pitch actually receive funding (here); similarly, only less than 1% of start-ups receive VC funding (here). Additionally, angel clubs and VC funds have been pushing for the inclusion of capital from retail investors for years to meet the ever-increasing capital demand of private companies (here, here, and here). It seems conceivable that firms accept any offer from investors, even if they are unfair.

3.4. Internal validity and robustness tests

3.4.1. Internal validity

I estimate the effect of access to private investments by studying household finances around the income eligibility rules of the accredited investor definition. A comparison of households with income just below and just above the thresholds allows to control for differences in skills and tastes with the only difference between the two groups that households above the cutoff have better access to private investments. To strengthen the validity of my findings, I will first study whether there are changes in other household characteristics around the income threshold. Second, I will check whether there is manipulation of income around the threshold.

First, columns 1, 2, and 3 of Table 6 respectively show the estimates of the intercept, change in the intercept at the cutoff, and *t*-values of regression (1) for different household characteristics. As can be seen, there are no discontinuities in other household characteristics, confirming that the characteristics are balanced around the threshold. The results suggest that households above and below the threshold have similar skills and tastes, and additionally suggest that no jumps in other characteristics have caused the previously documented changes.

Second, households may try to gain access to private investments by trying to manipulate their income. For example, households may lie about their income, with self-verification of some offerings allowing them to do so. Or, households may actively influence their income, e.g., by redeeming unrealized capital gains.[9] However, manipulation seems to be costly and not that easy. The issue of lying is mitigated by the fact that some offerings require proof of income, that angel clubs and investment funds typically require proof of income, and that lying increases litigation risk or reduces the possibility of taking legal actions against the issuer. The issue of influencing the income is mitigated by the fact that the income threshold must be reached not only in one year but at least in three years, that private investments typically occur over many years (accreditation must be renewed for every new participation), that there are adjustment costs like taxes on capital gains, and that influencing income actually only leads to minor income changes.[10]

The identification problem of manipulation is that households above the threshold may have different unobserved characteristics than households below the threshold that are related to private

[9] All households have an incentive to increase their income, addressing the concern that only those who want to participate in private markets try to have high income.

[10] For accumulated capital gains of $50,000, a redemption over three years would result in an increase in yearly income of less than $20,000.

investments and net wealth. Fortunately, lying should not be a problem in my setup. The reason is that, if households lie, they should only lie in the verification process of private investments, but not in the SCF (which is anonymous and unrelated to the verification). For influencing the income, if this is the case, we should empirically see bunching just above the threshold. Figure 6 shows the number of imputations for all households and separately for couples and singles around the thresholds. As shown, the densities appear continuous around the threshold.

3.4.2. Imprecise cutoff for couples

Couples can qualify either individually or jointly under the income test and the available data does not allow to distinguish between the incomes of the partners. Throughout the paper, I define the cutoff by the earliest eligible income of $200,000, plus the average wage of the partner. At this point, there should be a discontinuous increase in the number of households that have access to private investments. Importantly, while incorrectly setting the threshold can eliminate existing jumps, it cannot produce non-existing jumps. To further mitigate concerns, I will first study whether the results are similar results when looking only at single households for which a precise threshold is available. Second, I will check for discontinuities when comparing couples with an income below $200,000 and above. Third, I will study whether the results are stronger when further refining the sample around the threshold using individual partner wage. Fourth, I will exploit changes in the average wage of the partner across years.

First, Panel A of Figure 7 shows the main variables, i.e., private investments, net wealth, and private unrealized capital gains around the threshold only for single households. As shown, discontinuities exist around the given threshold value of $200,000. Columns 1–3 of Table 7 show the corresponding RD estimates and confirm the statistical significance of the changes. In Panel B of Figure 7 and in columns 4 to 6 of Table 7, I additionally show the results only for couples. The results show that discontinuities exist after the expected threshold value of $200,000, plus the average wage of the partner. To look at the problem from a more positive perspective, the fact that singles and couples have different threshold values allows actually for a valuable robustness test.

Second, while we cannot determine a precise eligibility value for couples, we can at least say that there should be discontinues changes in the variables from $200,000 onwards. Panel B of Figure 7 shows that there are discontinuous changes within the income range in which access to private investments begins.

Third, the results should be stronger when couples with an income between $200,000–$300,000 are excluded if they are defined as untreated but likely are treated and if they are defined as treated but likely are untreated. Specifically, the results should be stronger when excluding from the untreated sample those couples where the income minus the partner's wage is greater than $200,000 (low wage of partner suggests that the head has high individual income) and from the treated sample those couples where the income minus the partner's wage is less than $200,000 (high wage of the partner suggests that the head has low individual income). Columns 7 to 9 of Table 7 report the results. As shown, the RD estimates are considerably larger compared to those from the main analysis (the estimates regarding private investments, net wealth, and private unrealized capital gains from the main analysis respectively are $804k with *t*-value=3.47, $1,082k with *t*-value=2.60, and $498k with *t*-value=3.42).

Fourth, instead of using the average wage of the partner in 2013 for all years, we can set year-specific thresholds based on the average wage of the partner in a given year. The results should then be stronger. The (rounded) individual thresholds are $240,000 for 2013, $245,000 for 2016, and $250,000 for 2019. As shown in columns 10–12 of Table 7, the RD estimates are larger compared to those from the main analysis.

3.4.3. Individual years

A feature of the accredited investor definition is that the income threshold is not inflation adjusted, leading to changes in the composition of the accredited investor pool over time (see Table 1). For example, households that earned $200,000 in 2013 typically have different characteristics than households that earn the same amount in 2019. Looking at individual years therefore provides a valuable robustness test. Additionally, it gives an understanding of whether the results are driven by a single year or exist over several years.

Figure 8 shows the main variables for individual years. For couples, I use the adjusted thresholds for the specific year, that is, $240,000 for 2013, $245,000 for 2016, and $250,000 for 2019. As can be seen, discontinuities exist for each individual year. Table 8 shows the RD estimates and confirms the results.

3.4.4. Survey weights

The SCF provides weights that indicate how many similar households exist in the whole population for each rare observation in the SCF. I do not use weights because I am primarily interested estimating changes in private investments and net wealth around households that have an income just below and just above the threshold, which can be done without weights. There is no reason to assume that the SCF suddenly selects disproportionally more households with more private investments and net wealth after the income threshold. Additionally, weighted regressions suffer from imprecise weight estimates and difficulties to correctly estimate standard errors.

Figure 9 shows the main variables based on weights. Specifically, for each income bin, I calculate the population averages of the variables. As can be seen, the findings are unchanged. Similar to the main findings, the figure suggests changes in private investments, net wealth, and private unrealized capital gains by roughly \$350k / \$200k = 175%, \$700k / \$1,900k = 37%, and \$200k / \$100k = 200%, respectively.

4. Policy implications for the accredited investor definition

The accredited investor definition is a matter of much debate. Some argue that the rule prevents poor households from better returns, diversifying opportunities, and entrepreneurial investments, while others argue that poor households are typically unable and not interested in participating in private markets, and further note that the rule should actually be adjusted for inflation to ensure investor protection. The SEC is currently discussing possible changes to the law that range from its complete repeal to an inflation adjustment of the thresholds from now on to an inflation adjustment from 1982 onwards (SEC, 2023).

My study informs the debate around the SEC's rule making activity on the accredited investor definition. The rule prevented many households from optimal behavior and ultimately hampered their wealth accumulation. From a perspective that neglects potential differences in financial literacy between high- and low-income households, my findings suggest abolishing the law. The fact that wealth accumulation does not seem to be too strongly related to income (i.e., that we do not see strong exponential growth in wealth across income) suggests that income, financial literacy, and wealth accumulation are not too strongly correlated and presents some support for ignoring differences.

From a view that considers potential differences in financial literacy, my findings have other implications. First, they suggest that access to private markets should be given to all households that have sufficient financial knowledge. As such, they support the 2020 amendment that permit access based on financial literacy tests. Second, they suggest rejecting the proposal to adjust the thresholds since 1982 (e.g., the thresholds would have been about $750,000 and $500,000 for couples and individuals for 2016). Such a rule would have restricted many households in my sample period from wealth accumulation and these households were obviously on average capable of making good financial decisions. Third, they enable a more optimal rule setting. For example, in unreported results, I find that during my sample period households with an income of up to $100,000 less than the existing thresholds have the same level of financial literacy as eligible households. This suggests updated optimal eligibility thresholds that could serve as a starting point for future inflation adjustments. Note that the SCF measure of financial literacy only consists of three simple questions, and it should be worthwhile to repeat this exercise with a better measure of financial literacy.

5. Conclusions

In this paper, I study household finances around the income eligibility rules of the accredited investor definition. My analysis shows that access to private markets increases private business investments. Both passive retail and especially active entrepreneurial private investments increase. Furthermore, I find increases in wealth and returns. Economically, eligible households exhibit relative increases in the private investments to assets ratio, net wealth, and returns by 6.2pp, 39%, and 1.0pp, respectively. A back-of-the-envelope calculation shows that the accredited investor definition can explain as much as 28% of recent increases in wealth inequality.

My study offers several important insights. First, my study informs the wealth inequality debate by showing that differences in private business investments and returns are not only caused by differences in abilities and tastes between wealthy and poor households, but in important parts also simply by the accredited investor rule that determines access to private investments.

Second, my study also informs the debate around the SEC's rule making activity on the accredited investor definition. From a perspective that ignores potential differences in financial literacy between high- and low-income households, my findings support abolishing the law, as it has prevented many households from optimal behavior and wealth accumulation. From a more

perspective that considers potential differences in financial literacy, my findings have other implications, such as supporting laws that permit access to private markets to all households with sufficient financial knowledge, rejecting proposals to adjust the thresholds regarding 1982, and providing more optimal eligibility thresholds that could serve as a starting point for future inflation adjustments.

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Tables and figures

Table 1
Statistics on the accredited investor definition

	2013		2016		2019	
	Qualifying households as % of all households (millions) (1)	% of total net wealth (2)	Qualifying households as % of all households (millions) (3)	% of total net wealth (4)	Qualifying households as % of all households (millions) (5)	% of total net wealth (6)
Overall	8.5% (10.4)	70.7%	10.4% (13.1)	76.3%	11.3% (14.5)	76.9%
Income test	4.6% (5.7)	50.0%	5.8% (7.3)	57.2%	6.7% (8.7)	58.4%
Wealth test	7.0% (8.6)	68.4%	8.9% (10.4)	74.6%	9.2% (10.4)	74.8%

This table presents statistics on the accredited investor definition for different years. Refer to Table A.1 in the Appendix for variable definitions.

Table 2
Accredited investor definition and private investments

	Private investments		Ratio of private investments to assets	
	(1)	(2)	(3)	(4)
$1(I_i \geq \tau)$	816.1***	803.8***	0.063***	0.062***
	(3.44)	(3.47)	(3.01)	(3.00)
Constant	442.0		0.085	
Controls	No	Yes	No	Yes
Imputations	12,649	12,649	12,649	12,649
R^2	0.034	0.053	0.024	0.045

This table presents RD estimates around the accredited investor definition. The dependent variable is private investments (thousands $) in columns 1–2, and the ratio of private investments to assets in columns 3–4. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Table 3
Accredited investor definition and active and passive private investments

	Active investments		Passive investments			
	(1)	(2)	(3)	(4)	(5)	(6)
$1(I_i \geq \tau)$	698.6***	688.5***	48.1**	47.5**	57.4*	57.8*
	(3.36)	(3.38)	(2.00)	(1.98)	(1.89)	(1.92)
Constant	406.0		15.8		6.4	
Controls	No	Yes	No	Yes	No	Yes
Imputations	12,649	12,649	12,649	12,649	9,053	9,053
R^2	0.032	0.046	0.011	0.017	0.014	0.023

This table presents RD estimates around the accredited investor definition. The dependent variable is active private investments (thousands $) in columns 1–2, and passive private investments (thousands $) in columns 3–6. Columns 1–4 present the results for the main sample, and columns 5–6 present the results when households with active investments are excluded. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Table 4

Accredited investor definition, net wealth, assets, private unrealized capital gains, and private income

	Net wealth		Assets		Private unrealized gains		Private income	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$1(I_i \geq \tau)$	1,129.0**	1,082.0***	1,145.4**	1,104.7***	505.1***	498.2***	12.6	12.5
	(2.56)	(2.60)	(2.55)	(2.59)	(3.40)	(3.42)	(1.57)	(1.57)
Constant	2,766.3		3,119.0		227.3		41.6	
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Imp.	12,649	12,649	12,649	12,649	12,649	12,649	12,649	12,649
R^2	0.097	0.182	0.101	0.176	0.033	0.052	0.089	0.099

This table presents RD estimates around the accredited investor definition. The dependent variable is net wealth (thousands $) in columns 1–2, assets (thousands $) in columns 3–4, private unrealized capital gains (thousands $) in columns 5–6, and private income (thousands $) in columns 7–8. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Table 5
Accredited investor definition and return on assets

	(1)	(2)
$1(I_i \geq \tau)$	0.011**	0.010**
	(2.18)	(2.08)
Constant	0.034	
Controls	No	Yes
Imputations	12,644	12,644
R^2	0.047	0.068

This table presents RD estimates around the accredited investor definition. The dependent variable is return on assets. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Table 6
Balance of covariates

	Constant (1)	$1(I_i \geq \tau)$ (2)	t-value (3)
Age	54.22	0.698	0.58
Education	11.86	-0.042	-0.25
Number of kids	0.907	0.069	0.62
Race	1.44	-0.084	-0.86
House	1.06	0.011	0.45
Married	1.15	0.020	0.57
Risk	0.089	-0.005	-0.20
Literacy	1.98	-0.101	-0.85
Direct stock holdings	366.0	18.50	0.20
Unrealized gains stocks	82.7	-2.6	-0.10
Interest and dividend income	13.5	0.70	0.21
Controls	No	No	No
Imputations	12,649	12,649	12,649

This table presents RD estimates around the accredited investor definition for different household characteristics. Stock holdings, unrealized capital gains, and interest and dividend income are reported in thousands $. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. t-values are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Table 7
Robustness for imprecise cutoff

	Singles			Couples			Wage by household			Wage by year		
	PI	NW	PUG	PI	NW	PUG	PI	NW	PUG	PI	NW	PUG
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$1(I_i \geq \tau)$	783.0**	1,414.7**	591.8**	849.6***	1,084.2**	519.8***	1,317.3***	2,306.4***	783.5***	957.0***	1,408.7***	614.3***
	(2.26)	(2.04)	(2.17)	(2.99)	(2.16)	(2.89)	(4.47)	(4.50)	(4.26)	(3.80)	(3.19)	(3.82)
Mean	227.7	2,113.0	112.8	501.8	2,946.4	263.3	301.2	2,138.6	149.3	449.2	2,822.8	229.4
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Imputations	2,610	2,610	2,610	10,039	10,039	10,039	11,277	11,277	11,277	12,194	12,194	12,194

This table presents RD estimates around the accredited investor definition for different robustness tests. The dependent variable is private investments (thousands $) in columns 1, 4, 7, and 10, net wealth (thousands $) in columns 2, 5, 8, and 11, and private unrealized capital gains (thousands $) in columns 3, 6, 9, and 12. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. The reported means are the estimated constants of the corresponding regressions without controls. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

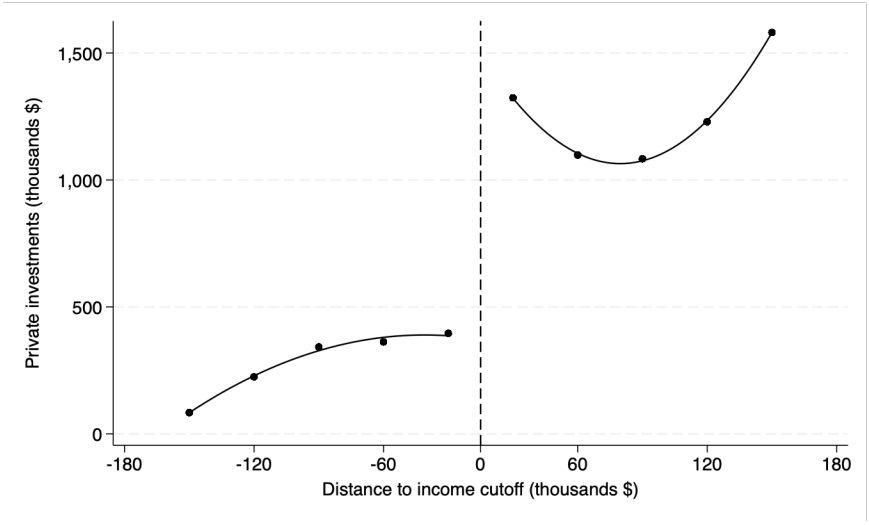
Table 8

Robustness for years

	2013			2016			2019		
	PI	NW	PUG	PI	NW	PUG	PI	NW	PUG
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$1(I_i \geq \tau)$	1,157.7**	2,121.9**	791.2**	1,081.9***	1,051.5	664.0***	736.5*	1,315.7*	535.6**
	(2.22)	(2.16)	(2.02)	(2.91)	(1.57)	(2.74)	(1.76)	(1.89)	(2.11)
Mean	476.8	2,581.1	242.0	304.8	3,045.8	143.6	562.0	2,800.0	307.0
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Imputations	3,633	3,633	3,633	4,190	4,190	4,190	4,371	4,371	4,371

This table presents RD estimates around the accredited investor definition for different years. The dependent variable is private investments (thousands $) in columns 1, 4, and 7, net wealth (thousands $) in columns 2, 5, and 8, and private unrealized capital gains (thousands $) in columns 3, 6, and 9. $1(I_i \geq \tau)$ is a dummy variable that equals one if the household has an income I_i above the threshold τ, and zero otherwise. The reported means are the estimated constants of the corresponding regressions without controls. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Panel A. Private investments



Panel B. Ratio of private investments to assets

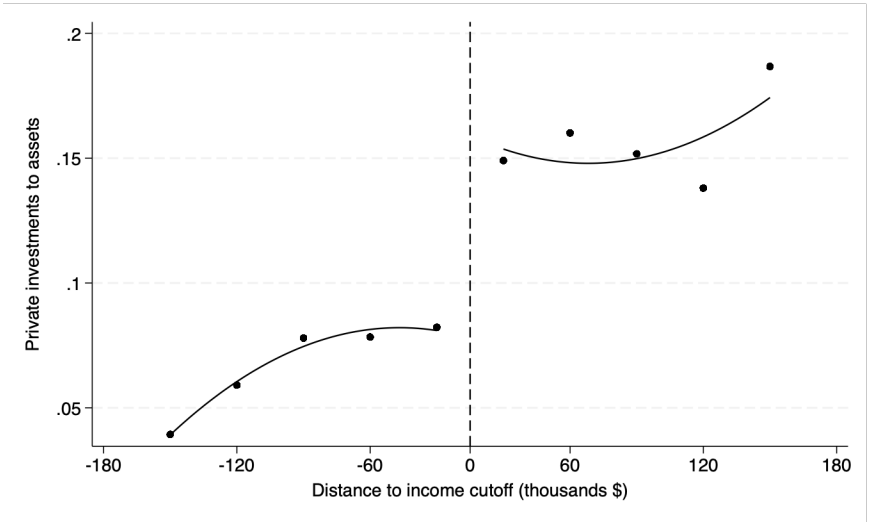
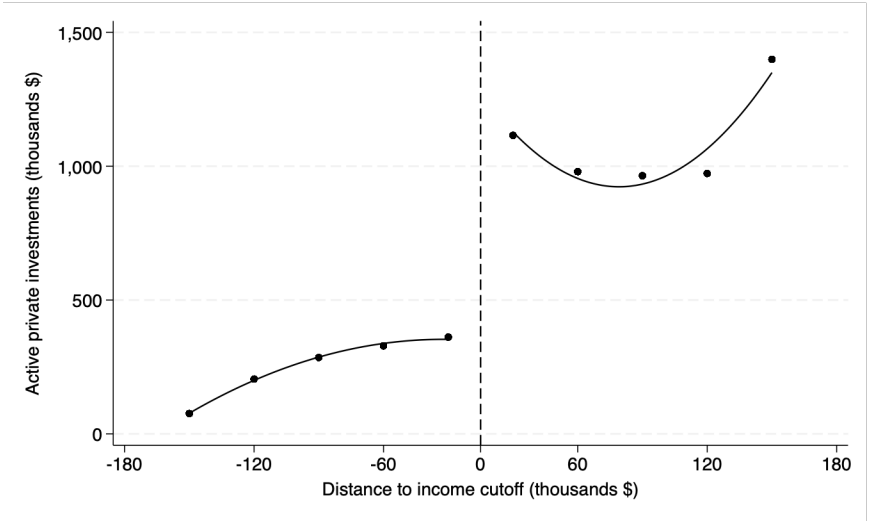


Figure 1

The accredited investor definition and private investments

Panel A plots private investments (thousands $) and Panel B plots the ratio of private investments to assets. Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Active private investments



Panel B. Passive private investments

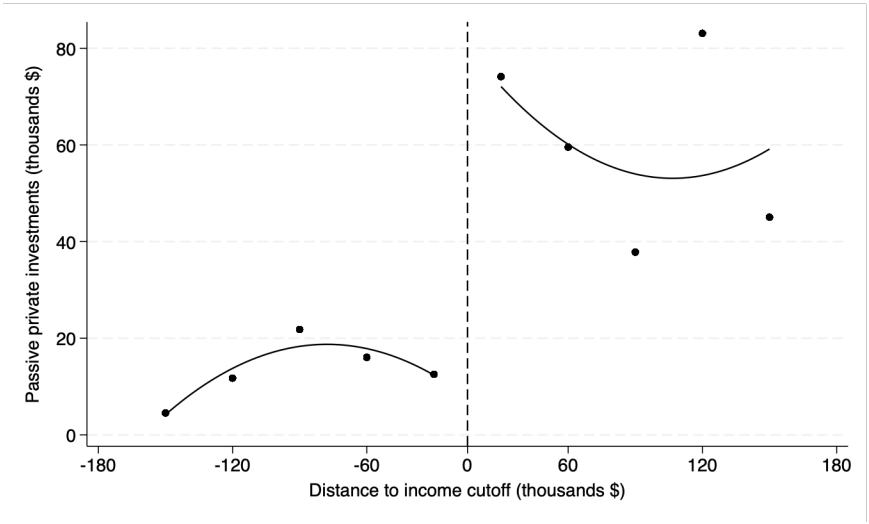
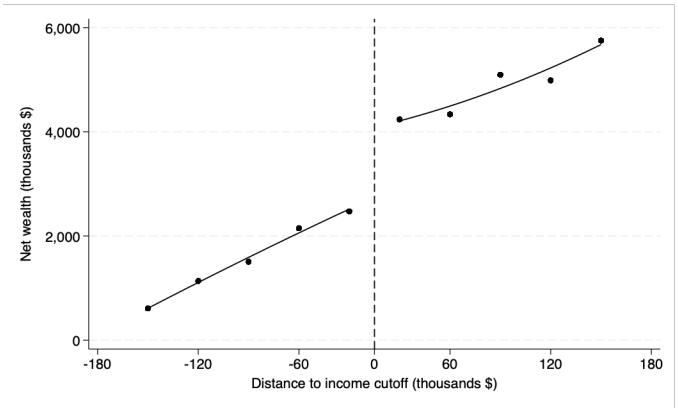


Figure 2

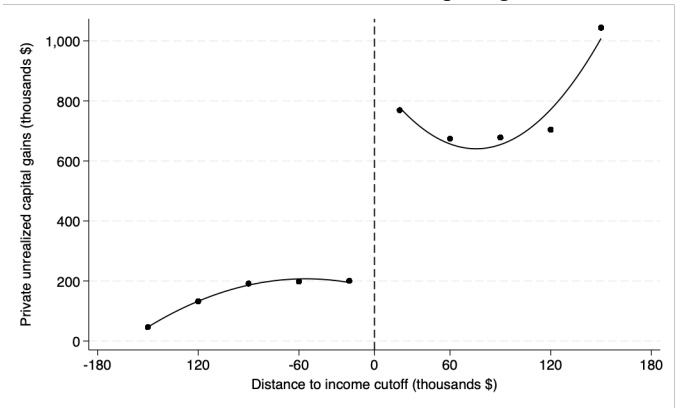
The accredited investor definition and active and passive private investments

Panel A plots active private investments (thousands $) and Panel B plots passive private investments (thousands $). Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Net wealth



Panel B. Private unrealized capital gains



Panel C. Private income

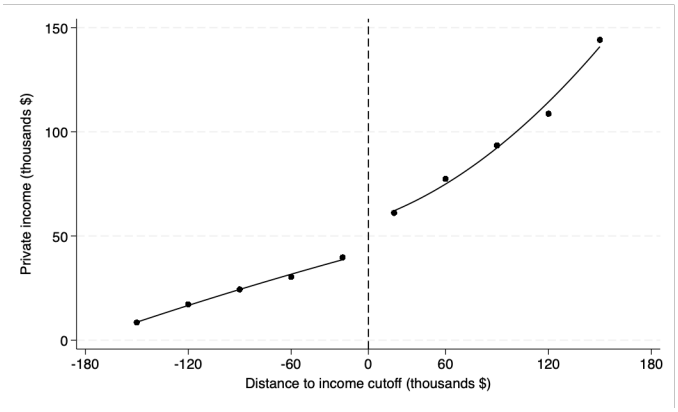
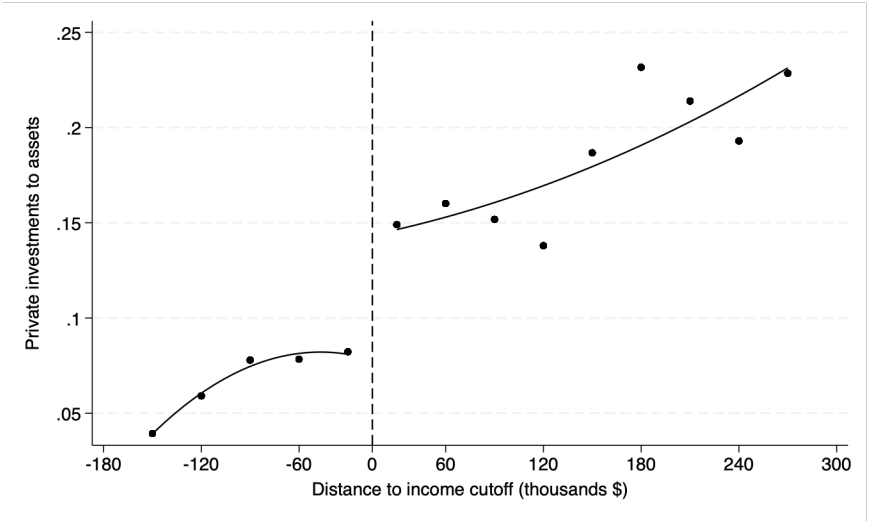


Figure 3

The accredited investor definition, net wealth, private unrealized capital gains, and private income

Panel A plots net wealth (thousands $), Panel B plots private unrealized capital gains (thousands $), and Panel C plots private income (thousands $). Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Ratio of private investments to assets



Panel B. Net wealth

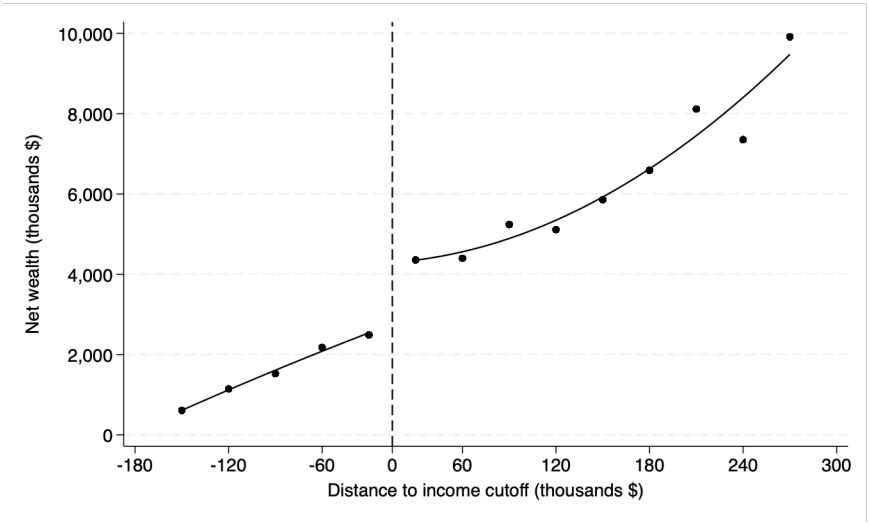
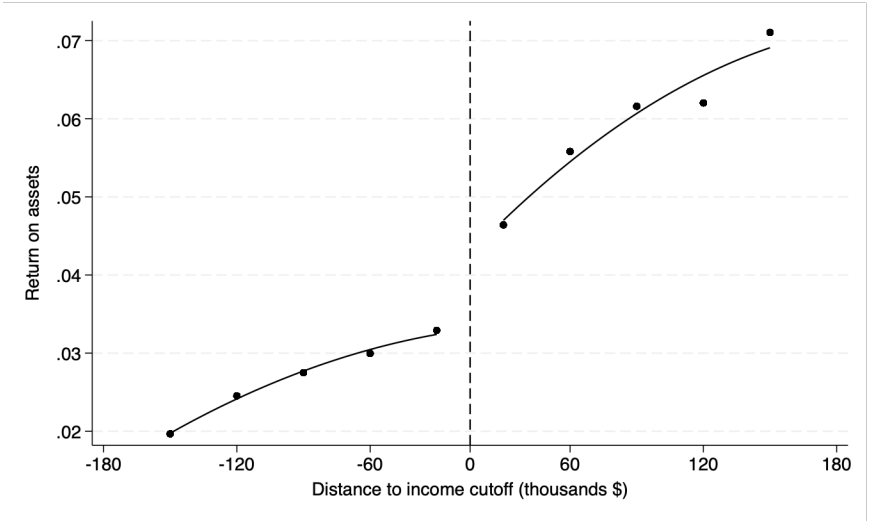


Figure 4

The accredited investor definition, private investments, and net wealth for an extended income range

Panel A plots the ratio of private investments to assets and Panel B plots net wealth (thousands $). Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Return on assets



Panel B. Risk-adjusted return on assets

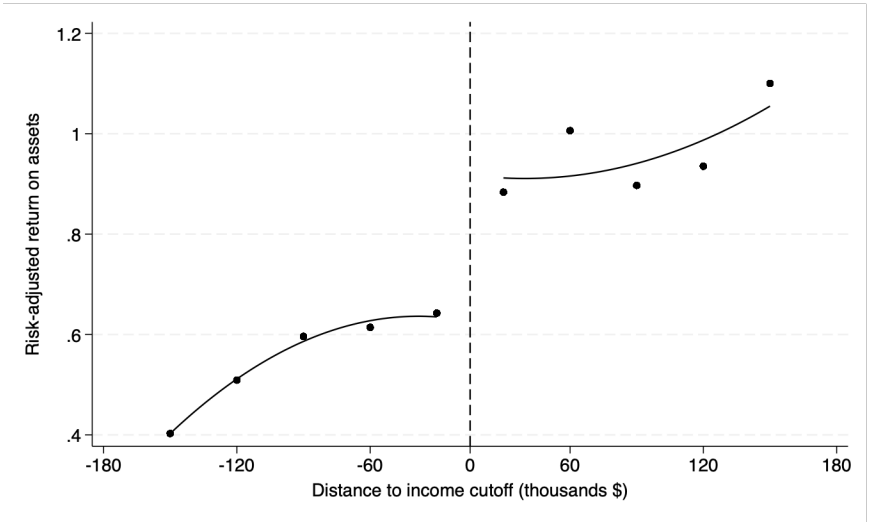
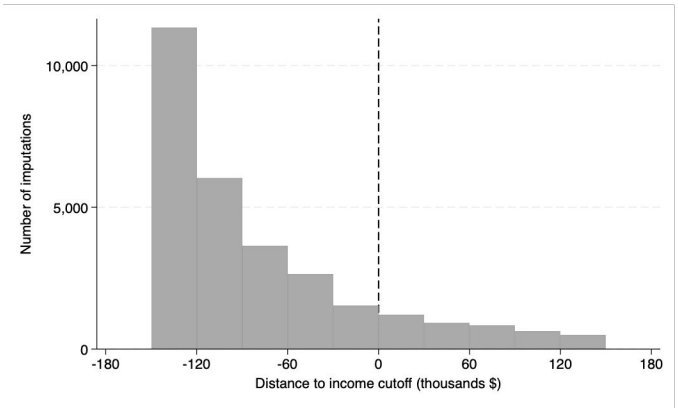


Figure 5

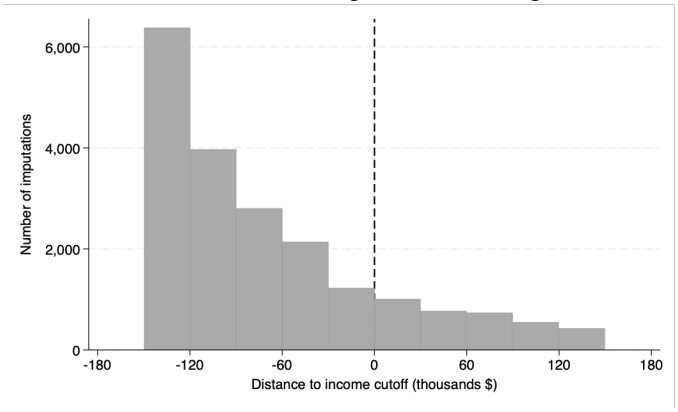
The accredited investor definition and return on assets

Panel A plots return on assets and Panel B plots risk-adjusted return on assets. Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Number of imputations for all households



Panel B. Number of imputations for couples



Panel C. Number of imputations for singles

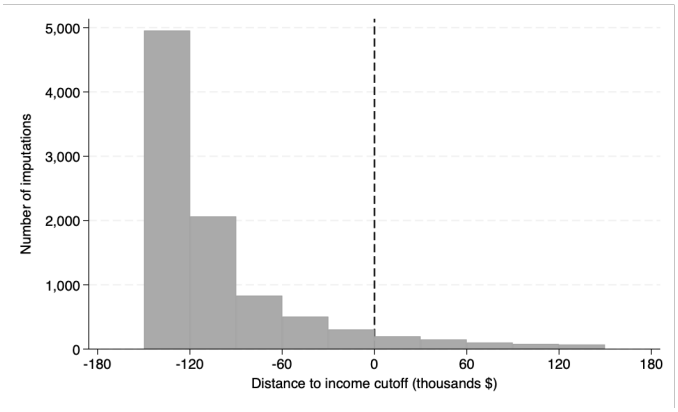


Figure 6

The accredited investor definition and number of imputations

Panel A plots number of imputations for all households, Panel B plots number of imputations for couples, and Panel C plots number of imputations for singles. Each bar is the number of imputations for households in income bins of $30,000. The vertical lines represent the accredited investor definition cutoffs.

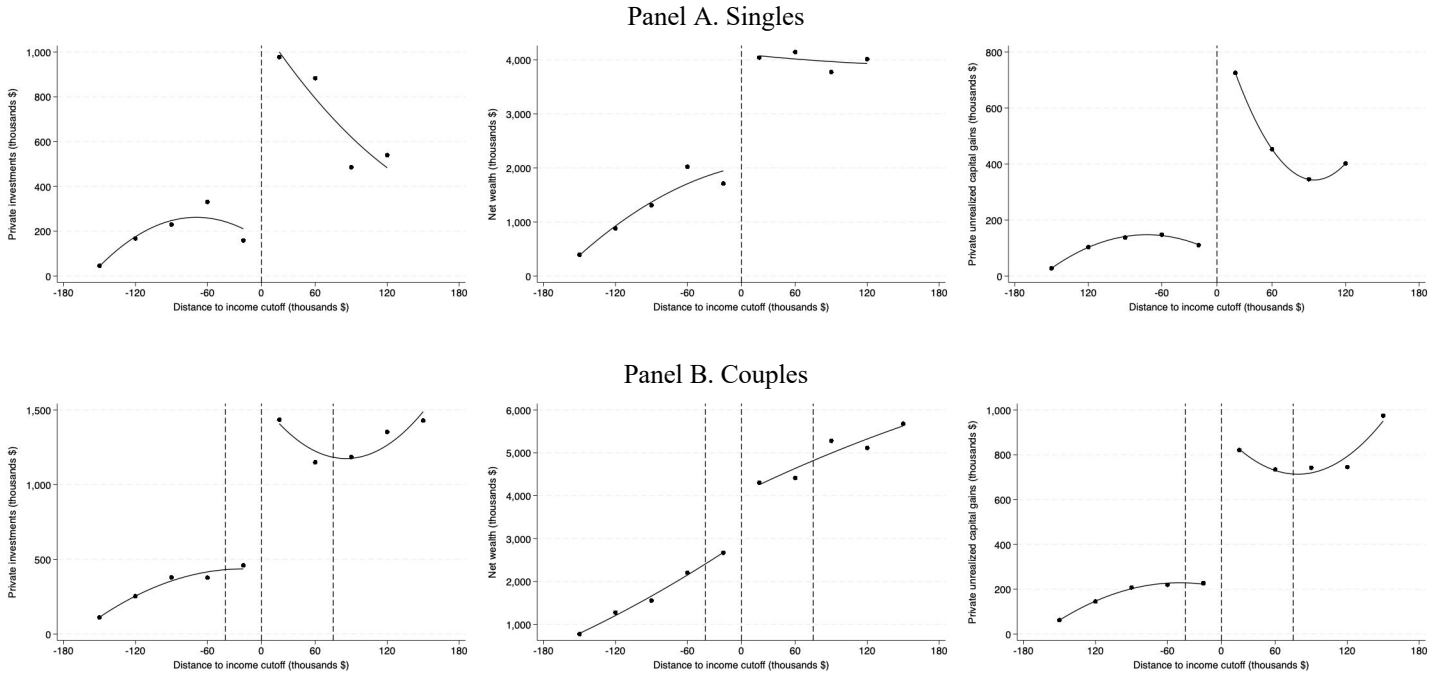


Figure 7

The accredited investor definition and main variables for singles and couples

Panels A and B plot private investments (thousands $), net wealth (thousands $), and private unrealized capital gains (thousands $) for singles and couples, respectively. Each dot is the average value for households in income bins of $30,000. The vertical lines represent the accredited investor definition cutoffs. The lines show fitted values based on a quadratic fit for each side of the cutoff.

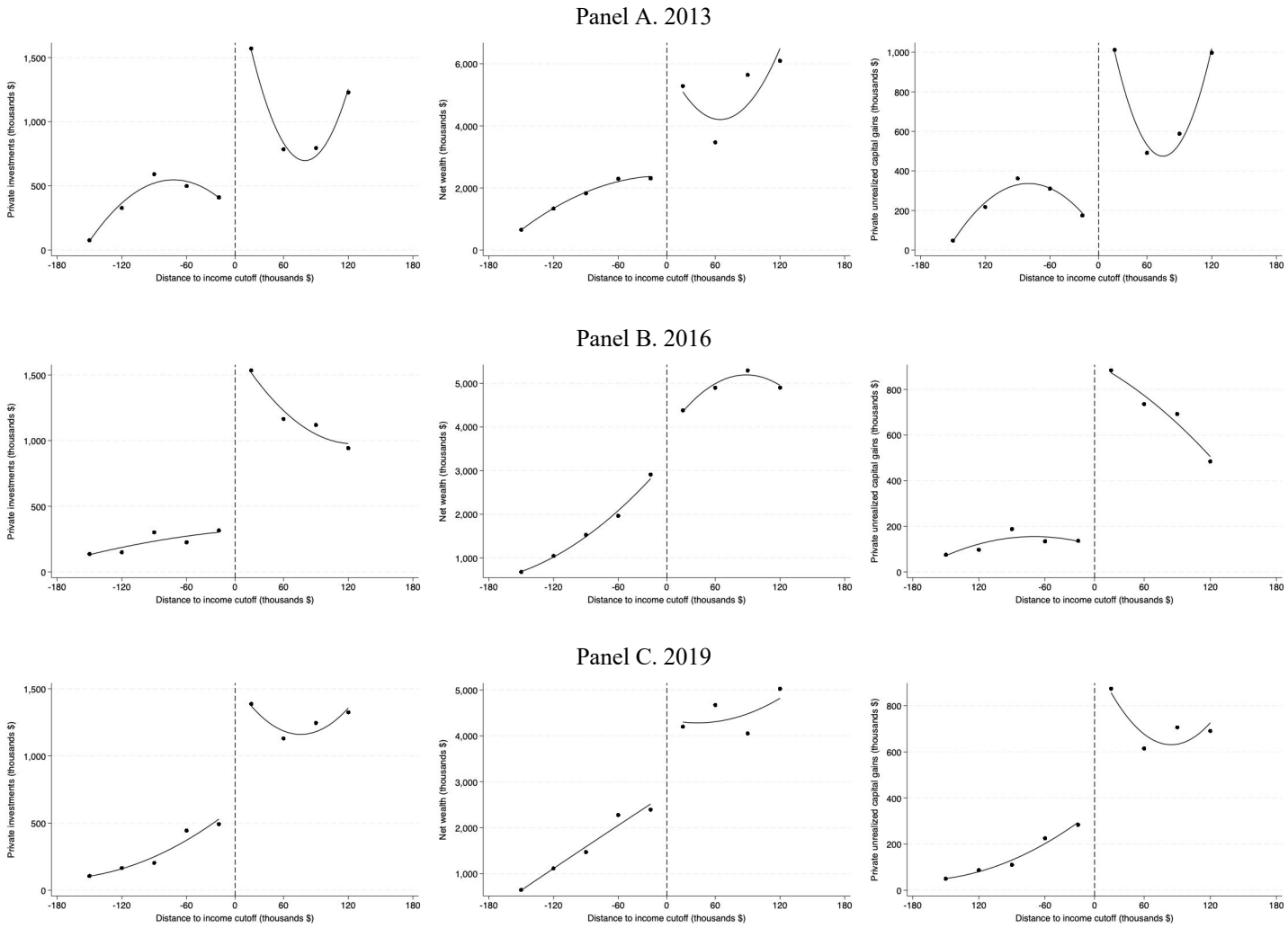
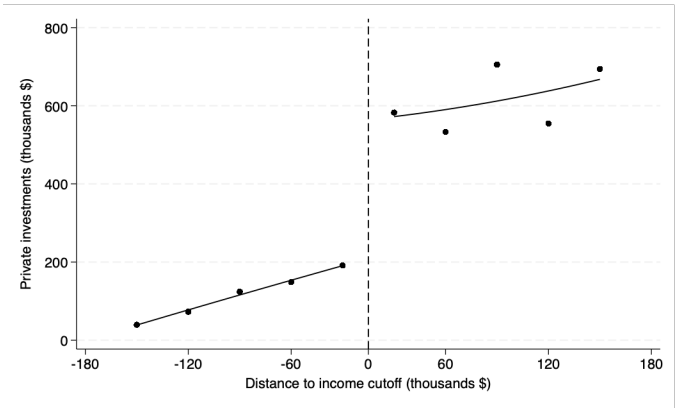


Figure 8

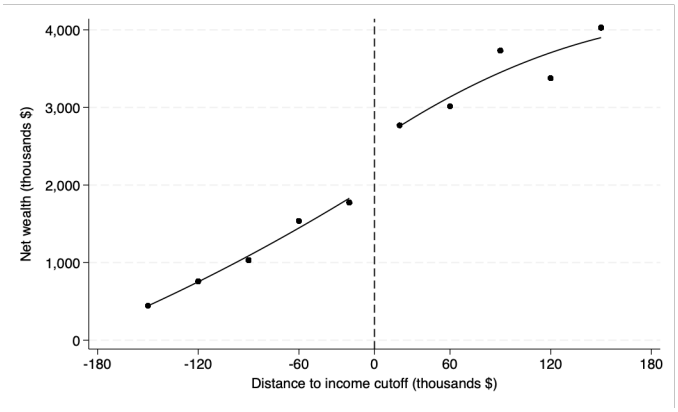
The accredited investor definition and main variables for different years

Panels A, B, and C plot private investments (thousands $), net wealth (thousands $), and private unrealized capital gains (thousands $) for 2013, 2016, and 2019, respectively. Each dot is the average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Panel A. Private investments



Panel B. Net wealth



Panel C. Private unrealized capital gains

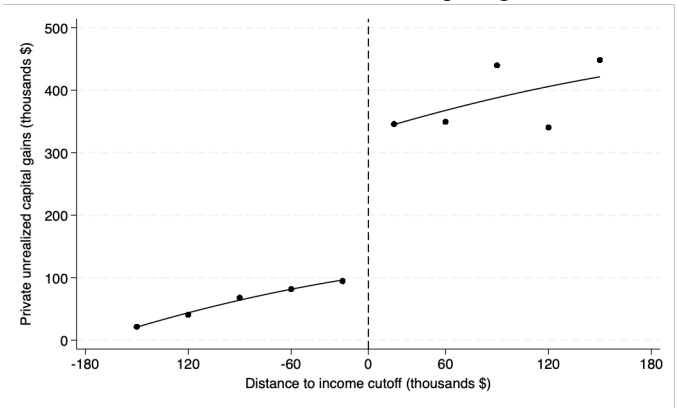


Figure 9

The accredited investor definition and main variables for different weights

Panel A plots private investments (thousands $), Panel B plots net wealth (thousands $), and Panel C plots private unrealized capital gains (thousands $). Each dot is the weighted average value for households in income bins of $30,000. The vertical line represents the accredited investor definition cutoff. The lines show fitted values based on a quadratic fit for each side of the cutoff.

Appendix

Appendix A.1

This appendix provides discussions on the results of Section 3.1.2.

First, do angel investors need to be accredited? Angel investors typically need to be accredited. They participate in Rule 506 offerings of Regulation D, which is the standard offering of start-ups, and which require accreditation. Additionally, angels often find start-ups through local angel clubs in which start-ups pitch their ideas, and the clubs typically require accreditation. There are some cases where accreditation is not needed when investing in start-ups, e.g., in Rule 504 offerings of Regulation D. However, this offering type is rather for investors with whom the company has a relation. Recall from Section 2.1., over 99.9% of capital raised in Regulation D offerings come from Rule 506, and about 99.7% of investors that participated in Regulation D offerings were accredited investors. For anecdotal evidence that discuss the need of accreditation and the active role of angels discussed below, see here, here, here, here, here, here, here, here, here, here, here, Lerner et al. (2018), here, here, here, and here.

Second, do angel investors play an active management role in start-ups (in other words, would angels say yes to the corresponding SCF question)? The SCF does not specify what constitutes an active management role, but in general it is understood as having a significant level of ownership and involvement in the decision-making process or day-to-day operations of the business. While some angels may play a passive role, the typical case is that angels seek an active role. While they are not involved in day-to-day operations, angel investors often take an active role by providing guidance, mentorship, and relations to customers and other investors, and also owning a seat on the board. Moreover, angels have a significant level of ownership in the business, often ranging between 10% to 20% at the beginning, and further increasing over time if the start-ups is doing well. For example, the CFI (here) describes angels as: “In most cases, they play an active role in the management of the new business as a way of protecting their investment and helping the owner build a thriving business.”. Notably, actively engaged investors should increase the probability that start-ups succeed, which should be reflected in higher values in the SCF data (while start-ups backed with passive angels may end up with zero value).

Third, Table 3 shows that active investments increase considerably more than passive investments, specifically, active investments account for about 90% of the overall increase in

private investments and passive investments for about 10%. At a first sight, this may seem counterintuitive as you might think that VC and PE funds raise more money than angel investments. However, a closer examination mitigates this concern. For example, in 2013, angel investments, VC funds, and PE funds respectively raised $25 billion (here), $29 billion (here), and $225 billion (here and here). Importantly, however, investors in VC and PE funds are typically not individuals but rather institutional investors; direct household investments account only for about 10% of the fund capital (here and here). As such, the relevant volume in VC and PE funds is about $3 billion and $23 million, which is roughly the volume of angel investments. Furthermore, PE investments should actually not be relevant for households that are just above the threshold, as it demands very high investment volumes. When only comparing angel investments with VC funds, angel investments account for 25 / 28 = 89% and VC funds for 11% of the relevant capital, which is close to what we see in Table 3. Other aspects that can additionally explain the issue is that active investments should lead to higher valuation after the initial investment as a form of management compensation, and that the holding period of active investments should be longer (VC and PE may just have cashed out and show zero investments).

Finally, in unreported analyses, I obtain several results that are consistent with the notion that the increase in active investments in fact comes from additional investments from investors rather than the possibility of additional investments by self-employed founders. Specifically, I find that the number of firms increases (as opposed to same number of firms with just a higher investment amount), and that the firms are bought instead of self-started; that the found effects disappear when only considering households that have self-started the businesses; and that households with active investments often hold have ownership in many firms as opposed to one.

Table A.1
Variable definitions

Variable name	Variable definition	Source
Income and wealth		
Income (*INCOME*)	Household income in previous year. Income includes wages, business income, interest and dividends, realized capital gains, food stamps and other programs, pension income and withdrawals, social security income, alimony and other support payments, and miscellaneous income. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Assets (*ASSET*)	Value of assets held by household. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Private investments (*BUS*)	Sum of the value of private active and private passive investments, calculated as net equity if businesses were sold today. Private investments come from the survey question "Now I would like to ask you about businesses you may own. Do you (and your family living here) own or share ownership in any privately-held businesses, including farms, professional practices, limited partnerships, private equity, or any other business investments that are not publicly traded? Do not include corporations with publicly-traded stock or any partnerships that have already been recorded earlier". The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Active private investments (*ACTBUS*)	Value of actively managed private investments, calculated as net equity if businesses were sold today. Active private investments come from the survey question "Do you (or anyone in your family living here) have an active management role in any of these businesses?". The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Passive private investments (*NONACTBUS*)	Value of non-actively managed private investments, calculated as net equity if business were sold today. Passive private investments come from the survey question "Do you (or anyone in your family) own or share ownership in any other businesses, business investments or other private equity that are not publicly traded and where you do NOT have an active management role?" The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Net wealth (*NETWORTH*)	The difference between value of assets and value of debt. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Private income (*BUSSEFARMINC*)	Income from private businesses, sole proprietorship, and farm. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Private unrealized capital gains (*KGBUS*)	Unrealized capital gains or losses from private investments. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Unrealized capital gains stocks (*KGSTMF*)	Unrealized capital gains or losses from stocks and mutual funds. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Interest and dividend income (*INTDIVINC*)	Income from interest and dividends. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Wage of partner (*X4712*)	Wage of partner of head of household in previous year.	SCF (full data set)
Direct stock holdings (*DEQ*)	Value of equity in directly held stocks, stock mutual funds, and combination mutual funds. The variable is inflation-adjusted to 2022 dollars.	
Inflation rate	Inflation rate based on the Consumer Price Index for All Urban Consumers. The data can be found here. I use the July values.	U.S. Bureau of Labor Statistics
Equity in house (*HOMEEQ*)	Value of equity in primary residence of household. The variable is inflation-adjusted to 2022 dollars.	SCF (summary data set)
Weights (*WGT*)	Weight indicating the number of similar households.	SCF (summary data set)
Income test	Dummy variable that equals one if the household has an income above the income thresholds, and zero otherwise. The income thresholds are $200,000 for singles and $240,000 for couples. The relevant income is calculated by deflating the 2022-dollar income to the previous year of each SCF wave (e.g., 2012 for the 2013 wave). Specifically, the relevant income is calculated by dividing the 2022-dollar income of the SCF waves of 2019, 2016, and 2013 by 1.176, 1.251, and 1.293, respectively.	SCF (summary data set) and U.S. Bureau of Labor Statistics
Wealth test	Dummy variable that equals one if the household has a net wealth minus the value of equity in primary residence above 1$ million, and zero otherwise. The relevant value is calculated by deflating the 2022-dollar value as for the income test.	SCF (summary data set) and U.S. Bureau of Labor Statistics
Household characteristics		
Age (*AGE*)	Age of head of household.	SCF (summary data set)
Education (*EDUC*)	Highest completed grade by head of household. The index ranges from -1 to 14 and higher values indicate higher education. For example, -1 is less than 1st grade, 8 is high school graduate, and 14 is doctorate.	SCF (summary data set)
Kids (*KIDS*)	Number of children in household.	SCF (summary data set)
Race (*RACE*)	Race of head of household. 1 indicates White, 2 African American, 3 Hispanic, and 5 Other.	SCF (summary data set)
House (*HOUSECL*)	Dummy variable that equals one if head of household owns house or equivalent, and zero otherwise.	SCF (summary data set)

Literacy (*FINLIT*)	Number of financial literacy questions answered correctly. The index ranges from 0 to 3 and higher values indicate better literacy. The survey asks questions about the understanding of risk and diversification, the compound interest effect, and inflation and purchasing power.	SCF (summary data set)
Risk (NO*FINRISK*)	Dummy variable that equals one if head of household is not willing to take financial risk, and zero otherwise.	SCF (summary data set)
Married (*MARRIED*)	Dummy variable that equals one if head of household is married or living with partner, and two otherwise.	SCF (summary data set)

This table presents variable definitions for the main variables used in the paper. The variable names in italics indicate the specific item in the SCF data. Detailed variable definitions for the summary data sets can be found here and here and for the full data sets here.