Entrepreneurship and the American Dream: How far Does the Upward Mobility Ladder Reach?*

– PRELIMINARY, PLEASE DO NOT CIRCULATE –

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Abstract

We use data from the PSID to present some stylized facts on the co-evolution of entrepreneurship, household wealth formation and intergenerational mobility in the US, between 1968 and 2013. We find that the vast majority of poor households participate solely in wage work, while almost 60 percent of the top 1% are involved in entrepreneurship - defined as either long term self-employment, incorporated business ownership, or un-incorporated business ownership. Households engaged in entrepreneurship experience substantial wealth gains over their observationally equivalent counterparts, regardless of where in the wealth distribution they came from. Specifically, those who own and work for their own incorporated business during young adulthood achieve an advantage of 13 wealth percentiles by middle age when compared to a similar wage employee, and 10 centiles when compared to a similar (but non-entrepreneurial) sibling. Note that this finding derives even when we control for parental status, in effect reflecting not just inherited wealth, but also financial gains from ones own accomplishments. While those who survive in entrepreneurship experience sizable wealth gains, access to this avenue is far from

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uniform. Those born in the top wealth decile are 4 times more likely to own an incorporated business during young adulthood, as compared to those whose parents had below-median wealth. The net effect is that successful entrepreneurial households are even less likely to come from humble-to-moderate beginnings than successful *non*-entrepreneurial households. Less lucrative forms of entrepreneurship, namely short term self-employment and unincorporated business ownership, do not suffer from the same access barriers but also confer much lower gains. This highlights the distinction in how financing constraints might vary by entrepreneurial tier and suggests that we focus not just on the entry (extensive) margin, but also on the survival, growth and incorporation (intensive) margins.

The observed access hurdles suggest analyzing what factors–beyond parental wealth – predict participation and financial success in entrepreneurship. The only consistent predictor throughout is parental experience in entrepreneurship. Education and IQ do correspond to entrepreneurial success, but are far smaller in magnitude than parental resources and appear to enter as a complement to parental financial capital, rather than substitute for it. We conclude that entrepreneurship has increased absolute mobility, but has done little if anything to enable more movement along the social ladder. It in some ways embodies the American Dream, but only for the exceptional, lucky, or wealthy few who do gain access. This study shows that any discussion on the inequality of opportunity in modern societies must take into account entrepreneurship.

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1 Introduction

Entrepreneurship is viewed as a key generator of innovation and economic growth, and as such a wide range of policies from tax policy and financial regulation to labor laws are designed intentionally to encourage such activity. Understanding what entrepreneurs respond to however can be particularly tricky since it is unclear whether policy should target the firm or the household. Entrepreneurship, and business ownership more specifically, is a reflection of individuals making the choice to form legal entities so as to create firms (Spulber, 2014). How to craft optimal policy then requires understanding entrepreneurship at both the household and firm levels. In the recent years, a number of papers in both the macroeconomics and productivity literatures have come focus on the role of new firms/ startups in the economy (Haltiwanger et al., 2013; Foster et al., 2016). Yet we know very little about the role entrepreneurship has played in the welfare of individual households and in facilitating economic mobility across households. Simply plotting the distribution of entrepreneurship against wealth shows a striking and positive relationship between the two, with less than five percent of the poorest households participating in entrepreneurship while over seventy percent of the wealthiest households are involved in such endeavors.[1]

In this paper we provide a detailed description of the coevolution of entrepreneurship in its various forms, and household wealth in the United States between 1968 and 2013. We link parents and children in the Panel Study of Income Dynamics and present a set of stylized facts about the correspondence between long term self-employment and business ownership, and household wealth accumulation and intergenerational mobility. The empirical patterns we present should inform theoretical inquiry and also provide fertile grounds for research on the mechanisms linking entrepreneurship to wealth, and consequently its role in inequality.

We begin by analyzing how entrepreneurship has factored into wealth accumulation for households that have engaged in it. Our use of the term entrepreneurship refers to long term self-employment, and both incorporated and unincorporated business ownership. [2] Simple transition probabilities show that absolute mobility (i.e. moving from the bottom to the top rung) is highest through entrepreneurship. The probability of having come from parents in the lowest quintile to then being in highest quintile oneself is 4 to 6 percent

[1] See figure 2

[2] We do not place emphasis on short-term self-employment as the data show this to be a transitory state where outcomes of households in this category are virtually indistinguishable from ones who never make such attempts.

for children who do not engage in entrepreneurship. For those who do, this probability goes up 4 to 5-fold to about 25 percent. Formalizing this analysis via rank-rank regressions (see Chetty et al. (2014a)), we find that households that spend more than twenty percent of their working lives in entrepreneurship experience substantial gains in their wealth standing relative to observationally similar counterparts. Controlling for both own and parental demographic and employment characteristics, as well as fine grained parental wealth standing, we find that a household that is self-employed more than twenty percent of the time is about four centiles wealthier than wage-employed households. Households that are involved in incorporated business ownership see even bigger gains, being nine centiles wealthier. In effect households that report both owning an incorporated business and being employed there are 13 centiles wealthier than their non-entrepreneurial counterparts. This finding persists in sign and magnitude when we compare across entrepreneurial and non-entrepreneurial siblings. These finding tells us that households that survive in entrepreneurship do see marked wealth gains regardless of where on the wealth distribution their parents were.

While these point estimates allude to the potency of entrepreneurship in wealth accumulation for those households that endure, it captures little information on access to this avenue, and how it relates to variation in economic outcomes across households more broadly. To get at a sense for what access to entrepreneurship by parental wealth looks like, we conduct the following empirical exercise. Rather than simply taking as given the transition probabilities described above, we instead look at it retrospectively and ask what the odds are that an entrepreneurial household observed in a given (wealthiest/ poorest) quintile came from a given (wealthiest/ poorest) quintile. In addition, we also look at the density of data in each of our transition probability nodes. This is in effect the density of business owners in the joint wealth distribution. The logic underlying both these exercises is as follows. If only a small number of poor children have access to entrepreneurship but then end up moving up the wealth ladder as a result, simple transition probabilities and point estimates in regressions will reflect the outcomes of just those who manage to avail of entrepreneurship. The retrospective and density exercises described here get around this limitation. We find that very few children from the poorest fifth of households manage to shift to the top rung of the ladder at all, let alone while accessing business ownership. Children from the wealthiest fifth of households however have remarkable odds of being business owners and remaining wealthy while doing so. Specifically, households who end up in the top quintile are highly unlikely to have come from the bottom 20 percent whether or not

they own a business (1-in-13 vs. 1-in-14). Whereas the odds that a wealthy household came from the top quintile are significantly higher for business owners than non-business owners (1-in-2 vs. 1-in-3). Figure 4 clearly and concisely illustrates this observation. The findings suggest that while individual entrepreneurial households stand to do very well, access is disparate.

Given that there appear to be access barriers, but yet households who manage to sustain as entrepreneurs see significant wealth gains, what then is the role entrepreneurship plays in explaining overall variation in wealth? And how might entrepreneurship stack up against other vehicles for wealth accumulation such as education and employment? To answer these questions, we run an r-squared decomposition. We look at the fraction of variation in wealth standing that is explained by various factors - ones that children have no control over and ones that reflect some element of choice. Factors that children have no control over include where they are born, when they are born, what their gender is and who they are born to - i.e. one can think of this as the birth circumstance, which is in effect completely random (exogeneous). Factors that reflect some element of choice include child's education and employment, which involves the decision to be an entrepreneur, where they live and their own family structure. Our predictive model including all factors, both in and out of ones control, is able to explain about 40% of variation in wealth outcomes. 23% of variation is explained solely by birth circumstance, while an additional 10% is explained by the state where one lives, the industry they work in and their marital status .[3] The three factors we single out for comparison are educational attainment, employment status and entrepreneurial status. Interestingly, all three factors explain very similar amounts of variation in the data; 2.6% by education, 3% by employment status and 2.4% by entrepreneurial status. These three factors appear to enter independently for the most part and are not simply correlated. This tells us that the degree to which entrepreneurship explains variation in wealth outcomes on the whole is very similar to that of education and employment - two factors that have received vastly greater amounts of attention in economics. One thing that is clear is that birth and life circumstance matter most. How much any one factor "should" matter is less clear, and even less so what the "correct" level of variation should be that more influenceable factors like education, employment and entrepreneurship should explain. However, given that these factors directly influence earnings and are arguably susceptible to policy intervention it stands to reason that research should be geared towards these topics, and to that end

[3]The vast majority of this additional 10% comes from marital status.

the role of entrepreneurship in household outcomes is demonstrably of consequence and ought to receive greater attention moving forward.

In order to understand what access barriers are and how policy might influence entrepreneurship we need to have some sense for who are most likely to avail of this occupational avenue in the current state of the US, and via what mechanisms. We shed light on both of these issues, focusing especially on the roles of parental employment, parental wealth, education and ability (as measured by IQ). We find that the only factor to systematically predict participation in the various forms of entrepreneurship (long term self-employment, business ownership and incorporated business ownership) is parental entrepreneurship and the data shows that parental entrepreneurship is itself increasing (parent) wealth. Furthermore, even accounting for parent entrepreneurship, we find that having parents from the top decile and especially the top 1 percent has a sizable influence on incorporated business ownership. In effect our results are telling us that parent wealth plays an outsize role in influencing the child's propensity to persist in entrepreneurship - especially the most lucrative kind, incorporated business ownership.

The effect of education varies by type of entrepreneurial engagement. Being a college graduate increases the odds of incorporated business ownership while long term self-employment is most probable for college dropouts and those with graduate degrees. Once we account for parent wealth and various child and parent demographic and occupational factors, education on the whole is neither systematically nor monotonically predictive of entrepreneurship, regardless of type. This squares with our finding in the r-squared decomposition that entrepreneurship and education take on relatively separate roles on explaining variation in overall household outcomes. This lack of a clear correspondence between education and success in self-employment and/or business ownership could reflect a number of mechanisms. The skills valuable to entrepreneurship may not be solely conferred by education, and the signaling value of formal education may be less crucial to succeeding in entrepreneurship. Alternatively, having a good venture idea may itself increase the opportunity cost for higher education. In addition, children who have some certainty of becoming entrepreneurs, in particular ones whose parents are themselves entrepreneurs with a business to pass on, might not rely so heavily on such a signal. While it is beyond the scope of this paper to parse out these various explanations, it is important that more research is conducted on the relationship between education and entrepreneurship - to understand whether they are substitutes or complements to wealth formation, and

why (see Van Praag et al. (2013)).

Since it is arguable that educational attainment might not wholly reflect the skills most important to entrepreneurship, we then look to an alternate measure of ability and one with empirical support for entrepreneurial sucess (Hartog et al., 2010), IQ at childhood.The data reveals that higher IQ at childhood is (weakly) predictive of adult entrepreneurship. We use as a basis for comparison, the relationship between IQ and college completion. Stacking the IQ-entrepreneurship relationship against the IQ-education one, we find the association of IQ to college completion to be much stronger than that to business ownership. However, education is the primary channel through which IQ manifests, where once we account for education IQ no longer predicts business ownership.

Taken together, the findings on parental wealth, education and IQ suggest that social capital and financial capital matter more in predicting entrepreneurship than standard measures of human capital - namely IQ and education.[4] We arrive at this interpretation given that IQ only predicts entrepreneurship through education which itself attenuates greatly in importance once we account for parental wealth. This renders parent entrepreneurship, itself a function of wealth, to be the only factor to consistently predict child entrepreneurship. In addition, very high parent wealth remains predictive of incorporation even accounting for all other factors. Parent occupation confers social capital, while parent wealth suggests that financial capital also plays an important role in influencing a child's likelihood of becoming an entrepreneur.

Given our findings thus far, one might infer that entrepreneurship, while impactful for households that make the attempt and survive, might not enter significantly in facilitating economic mobility economy-wide due to differential access, especially amongst those coming from less wealth. Empirics show this is in fact true for overall mobility. We run a simple test and compare the estimated rank-based inter-generational elasticity (IGE) both with and without entrepreneurs. The IGEs in both circumstances are statistically indistinguishable, at around 0.37 to 0.39. Looking at subsamples of entrepreneurs to test for internal mobility, we find that mobility in the aggregate is no higher for all subsets of entrepreneurs, except for unincorporated business owners where this increased churn is primarily driven by downward shifts of children from wealthy households.

The overall IGE estimates described above capture the averaging of upward and downward mobility

[4] An alternate and very plausible interpretation, is that entrepreneurial ability involves different skills that are not necessarily captured by standard human capital measures.

across all sub-populations in the data. However, it is possible that different groups of people experience different amounts of social mobility through entrepreneurship. To better understand who, if anyone, is more socially mobile by association with entrepreneurship, we look at how mobility relates to ability, parent entrepreneurial status and parent wealth. We find that high ability increases mobility at low initial wealth levels, but this comes through wage employment, and not entrepreneurship. This is not to say IQ is unhelpful in entrepreneurship. IQ certainly corresponds positively in the wealth of entrepreneurial children from poorer households; it just does not offer a differential boost to mobility if you come from a poor versus a richer home. Very interestingly, IQ is much less predictive of various achievements (including wealth outcomes) for children of entrepreneurs, where the higher IQ child sees disproportionately *lower* wealth gains from entrepreneurship than their less gifted siblings. In terms of mobility, those with low IQ who then go on to be entrepreneurs have the same (and small) proportionate wealth increase, regardless of initial wealth. High IQ on the other hand interacts differently with entrepreneurship depending on where on the wealth distribution one comes from. High IQ children from poor households see similar gains though wage-employment and entrepreneurship. High IQ children from wealthy households on the other hand see disproportionately high returns from entrepreneurship as compared to wage work, implying a complementarity between ability and family resources in entrepreneurship. Together, these findings not only reaffirm the prospect of informational and financial barriers to entrepreneurship, but also suggest that business owning parents make differential investments in their children - possibly bequeathing, as a form of insurance, the business to their less gifted child who might not perform as well in wage work.

While this paper is oriented towards describing empirical patterns, rather than identifying causal mechanisms, the findings clearly point to the need for more extensive work on the channels that link entrepreneurship, wealth and mobility. The findings suggest that entrepreneurship can be an effective vehicle for wealth accumulation, even for individuals coming from humble beginnings. Access however is clearly unequal. This finding of unequal access is not unique to entrepreneurship. High status occupations (Hsieh et al., 2017) and inventors (Bell et al., 2016) suffer from similar access issues. One explanation for this is simply that wealth matters for occupation specific human capital accumulation(Hsieh et al., 2017). Another explanation is that in entrepreneurship, financial frictions themselves play a role, independent from human capital accumulation. Access to cash for firm growth and/ or to weather periods of losses might make the difference

between succeeding and failing for entrepreneurs regardless of their skill. One obvious way to manage these risks is to have a buffer of wealth from one's parents. While the literature (Fairlie and Krashinsky, 2012; Hurst and Lusardi, 2004) is inconclusive on the role of financing constraints, our findings suggest looking not just at the extensive margin of entrepreneurship, but also at the intensive survival, growth and incorporation margins. A third explanation is that the institutional details on firm creation and growth are difficult and costly to access. For instance, in order to succeed, an entrepreneur must understand local regulations, the personal finance protections available (Fan and White, 2003) and the tax laws that affect their expected returns (Cooper et al., 2016; Cullen and Gordon, 2007; Gordon, 1998) to name a few factors. In addition, understanding how and when to incorporate and how to access cost effective financial capital are also not obvious issues. None of these factors have to do with the quality of the entrepreneurial idea. They are all institutional details for which there is no "textbook". To that end, having entrepreneur parent advisors, or the financing to get legal and accounting advice a priori could result in the differential access we observe. Fourth, amongst the wealthy, entrepreneur parents could simply be passing on successful businesses to their children. If that is the most effective way to acquire a business, then we should expect to see the access patterns observed in the data. Finally, one could argue that risk preferences vary by parental wealth. While we cannot rule this out, it is important to note that we do not find as stark a parent wealth correspondence in the extensive (ever having tried) margin of self-employment as we do in the intensive (survival and incorporation) margins. While it is beyond the scope of any one paper to parse these mechanisms out, the patterns we present should provide a sound basis for future work on each of these channels.

The rest of the paper is organized as follows. Section 2 presents a brief overview of the relevant literature. Section 3 discusses the possible channels that might play a role in how entrepreneurial households build wealth. Sections 4 through 6 introduce the PSID data and how the phenomena of interest are manifested in this context. In sections 7 through 9.1 we investigate the data more closely, establishing detailed links between entrepreneurial activity and wealth mobility, and finally examining the implications for overall degree of churning in US society. Section 10 concludes.

2 Literature

This paper relates to a sizable literature that studies income and wealth mobility in the United States (see Solon (1999) and Black and Devereux (2010) for an overview of the literature). Work in this literature focuses on the role of factors like education, child's income and employment, savings behaviors and geographic exposures in facilitating intergenerational mobility (see Charles and Hurst, 2003; Mazumder, 2005; Chetty et al., 2014b; Clark, 2014). However, there hasn't been much focus on the role of *entrepreneurship* in social mobility (see Quadrini, 2000a; Holtz-Eakin et al., 2000; Fairlie, 2004).[5] Papers that have looked at entrepreneurship as a mode of wealth building have either resorted to cross sectional analyses (mainly employing transition matrices), or have focused on income mobility (whereas the income of entrepreneurs faces severe mis-measurement (Pissarides and Weber, 1989; Hurst et al., 2014; Sarada, 2015)). What sets our work apart is that we exploit both cross sectional and longitudinal data, focus on the inter-generational angle, and study shifts in wealth rather than income. In doing so, we get around measurement issues and inference problems that arise from transitory changes in welfare. Unlike most other papers in the literature we break down entrepreneurship into long term self-employment, incorporated and unincorporated business ownership, and show that these categories while overlapping, also have distinctive features that correspond to household outcomes. In addition, we go beyond documenting wealth accumulation and mobility patterns in general but also hone in on three specific channels that manifest in these patterns. Namely, we isolate the roles of parent wealth, parent occupation and child ability. To the best of our knowledge, this is the first paper to comprehensively address the co-evolution of of entrepreneurship, wealth accumulation in inter-generational wealth mobility.

Recent work by Bell et al. (2016) on the lifecycle of inventors is in many ways a closely related paper. While the focus of their paper is on patenting inventors and ours on entrepreneurs, it is common belief that the two occupations go hand in hand in influencing economic growth and development. While patents pick up certain types of inventions, arguably the more technical and quantifiable ones, many process, product and even market innovations are generated by entrepreneurial ventures. To that end, we are interested in entrepreneurs for many of the same reasons the authors of Bell et al. (2016) are interested in inventors.

[5] Note that business ownership does enter as a factor in papers that study savings behaviors. We focus exclusively on this avenue, isolating its role in a comprehensive manner.

At the onset, one might assume that access to entrepreneurship has fewer barriers - it is often viewed as the American Dream (the so-called Horatio Alger symbolization). Since becoming an inventor, at least in the modern day, might require the acquisition of technical skills, and the signals necessary to get jobs at established and known innovative organizations (i.e. Google, Apple, Intel, Pfizer, MIT etc.), it is arguable that entry barriers are more probable. Bell et al. (2016) do in fact find resounding evidence for such barriers, where inventors are more likely to come from wealthy households and to be children of inventors themselves. It is perhaps somewhat surprising is that our conclusions for entrepreneurs are not qualitatively dissimilar, suggesting similar access barriers.

The paper also relates to a large literature on occupational choice. If entrepreneurial firms are ultimately the ones to generate employment and innovations (Haltiwanger et al., 2013; Wong et al., 2005; Baumol, 2002) we then care greatly about whether the best and the brightest individuals are selecting into it, and if not, what barriers they might face. The standard Roy model (Roy, 1951) shows that in a frictionless world, individuals should sort into occupations based off comparative advantage. Following the logic presented in the Roy model, Hsieh et al. (2017) propose a rational sorting model, but one with frictions to show that in the presence of human capital access barriers, misallocations can occur where individuals from disadvantaged populations are less likely to sort into their optimal occupation. One implication is that then, those individuals from disadvantaged populations who do go on to engage in high status jobs, are then of higher calibre. These access barriers to entrepreneurship-specific human capital, as proposed in the Hsieh et al. (2017) model could explain our empirical findings that relate children from wealthy households to entrepreneurship. Bell et al. (2016) depart from rational sorting model and add payoff uncertainties to predict, consistent with their data, that inventors from disadvantaged groups do not appear more talented. The argument underlying this prediction is that disadvantaged groups are less exposed to (i.e. have less accurate information on) the returns on invention and as such tend to "underestimate" the returns from invention (Hoxby and Turner, 2015). The resulting predictions of their inventor specific model are mostly consistent with our empirical findings. Entrepreneurs, like inventors, are more likely to have higher human capital, have been exposed to entrepreneurship, and less likely to be from disadvantaged groups.*Our data however suggests that unlike inventors, entrepreneurs from disadvantaged groups are not of lower (or higher) initial ability.* Figuring out which occupational choice model best fits our data, if any, is our next undertaking and will be added

to future versions of this paper. For the most part however, our findings on entrepreneurship square with those in the innovation literature. As with Celik (2015)'s "missing Einsteins" our evidence suggests looking for ways to create the "missing Jobs [Steve Jobs]" - brilliant children who rise from rags to riches through entrepreneurship.

Finally, this paper also relates to the returns to entrepreneurship literature (Hamilton, 2000; Hyytinen et al., 2013; Sarada, 2015). Our finding, that entrepreneurial households, regardless of starting point, go on to experience substantial wealth gains is consistent with the findings in Sarada (2015), that there likely are positive returns to successful entrepreneurship. While identification remains a challenge, our findings suggest thinking about wealth and income jointly in assessing the financial gains from entrepreneurship.[6]

3 Why might entrepreneurship play a differential role in wealth building?

The main premise of this paper is predicated on the presumption that entrepreneurship facilitates socioeconomic mobility. Why should we expect that entrepreneurship affords differential access to mobility as compared to wage work?

We classify plausible explanations into two categories. Explanations in the first category relate to behavioral changes that enable and are induced by business activity in the face of credit constraints, and those in the second category are the direct consequences of higher returns that stem from successful business ownership (relative to wage work). Note that in this latter category, many elements of public policy that favor business formation affect both the return and the risk profiles entrepreneurs face. In the discussion below we will focus on some of these policy provisions available to entrepreneurs but not wage workers. These include favorable tax treatment of financial gains (and losses) to businesses, and bankruptcy provisions available to incorporated firm owners.

The main behavioral argument that leads to the creation of wealth by entrepreneurs is that of an increased propensity to save. As argued in Quadrini (2000b) and Buera (2009), the sheer act of starting a business could result in an increased propensity to save in the face of constrained credit markets, higher costs of external financing, and uninsurable idiosyncratic risk. Individuals who want to start a business, especially

[6] In fact findings in Charles and Hurst (2003), that wealth and portfolio composition relate only through income, except for business ownership (and real estate) are consistent with this argument.

the less wealthy who cannot easily access formal credit or pre-existing personal wealth, may increase their savings rate so as to fund their enterprise. In addition, if the risks faced in entrepreneurship are un-insurable and credit is limited, such households may engage in precautionary savings so as to secure a larger buffer of wealth to draw upon during negative shocks. This differential saving propensity enables increased wealth accumulation and consequently, mobility.

The second factor that results in increased wealth accumulation amongst entrepreneurs is that they are the residual claimants. The entrepreneur has more agency in directing their investment into their business based off private information on the outcomes. Unlike wage workers who receive a wage and then invest their savings in markets (where they lack an informational advantage and are passive in their investments), business owners can channel both financial and human capital into the most promising investments. Since they get to internalize the full returns from their venture,[7] they are more likely to double down on effort, thereby ensuring better outcomes and higher earnings.

For poorer households, entrepreneurship may be the only credible way to achieve mobility, since access to high paying wage jobs may be a rarity given the systematic barriers to access that exist from the get go. High paying jobs, at least at the entry stages, rely on signals from brand name schools, internship experience and hard to access higher degree fields (economics, finance, law etc.). In contrast, starting a business in many industries (restaurant, laundromat, services - hairdressing, automotive, food services etc.) is less dependent on these expensive signals. While labor wages in these industries are typically low and therefore don't afford much opportunity for mobility, business returns may be relatively high, especially if the entrepreneur is skilled and manages to distinguish herself to become a local monopoly.

In addition, taxes are typically favorable to the self-employed and business owners. Both have discretion in where and whether to report income, and are incentivized to use equity which is subject to lower capital gains tax rates.[8] Finally, local governments and the Small Business Administration provide subsidized loans to businesses. This cheaper avenue of financial capital cannot be accessed by the wage worker looking to invest in public stocks. Preferential tax treatment and subsidies therefore alter returns to entrepreneurs in

[7] This is of course subject to the contract terms negotiated with investors, but it is arguable that in the vast majority of cases, the entrepreneur internalizes the returns from her efforts to a higher degree than that offered in wage work – where profits are more broadly shared and where it is harder to attribute efforts entirely to any single individual.

[8] There is variation in these policies over time. See Clarke and Kopczuk (2016) for a discussion of how these tax policies have varied over time.

ways that may allow them to build wealth more easily. These policies also factor in on the risk mitigation end, by increasing risk sharing with the government (see arguments in Domar and Musgrave, 1944).

While many factors point to increased wealth building for entrepreneurs, and particularly so for the poor who have less access to high paying wage work, the issue of downside risk and financial frictions that may inhibit entry need to be factored in.

As regards downside risk, how it might affect mobility is less obvious, and is likely to vary by where on the wealth distribution we were to start looking. First, at a very basic level, losses are limited by the assets one possesses.[9] For those at the lowest end of the wealth distribution nominal losses are limited, but can be very costly to household well-being, given their low ability to absorb risk; in addition, these households may lack the capital to enter entrepreneurship in any capacity. Therefore, we shouldn't see much downward movement, but we will also see less entry amongst this group. As people get wealthier, the odds of entry should increase, but so long as personal assets are not protected (sole proprietor-ships and unincorporated firms), the downside risk of falling in wealth standing should be higher than that faced by wage workers. As people get wealthier and have the information and financial capacity to incorporate, the downside risk should fall, since bankruptcy laws now protect personal assets. In the presence of tax policy and bankruptcy laws that facilitate risk sharing with the government, only those who are not at the bottom to begin with, and who are at the same time in a non-protected form of business ownership, will experience downside. The poorest and the wealthier folks with incorporated businesses are – for different reasons – less exposed on average to entrepreneurial risk.

Between tax policy and bankruptcy laws, the downside risk of owning an incorporated businesses is shared with the government, in ways that are not available to wage workers. Unincorporated businesses and sole proprietors face the biggest downside risk - but given the lack of government oversight and flexibility in reporting, they are also the most likely to avail of the tax benefits to income under/misreporting, which feeds into the upside.

Financial frictions would imply that pre-existing wealth is the primary barrier to access to entrepreneurship. This should vary across geographies with differential credit availability. However, both equity and

[9]That said, it should be noted that defualting on credit cards debt, a source of financing commonly used to start/sustain a business, can result in wages being garnished in the event of default. In addition, poorer households may access informal credit channels which can have large negative effects in the event of default. Both of these more expensive avenues are ones that are more likely to be availed of by the less wealthy – though not *the* poorest.

debt are more expensive (due to lemons and principal-agent problems) than using ones' own capital for a given risk profile. This means that all else equal, the wealthy would be more likely to start businesses and given the lower cost of capital, their businesses would likely fare better.

Overall, one should expect that for the poor, those who self-select into entrepreneurship should fare better than wage workers in enabling socioeconomic mobility. Part of this is due to the lower bound on downward mobility, and part to the fact that the entry threshold is higher and so more capable individuals will select into entrepreneurship. The likelihood of becoming a business owner should increase in wealth - and the desire to shield pre-existing wealth also increases the likelihood of incorporating amongst those with assets to shield. Tax policy and flexibility in private business valuation both act as shields to wealth, presenting business owning households an even bigger upside. Downside is limited by bankruptcy laws and risk sharing with the government and investors. So at the household level, we should expect entrepreneurship to result in a sizeable upside, with limited downside, except for sole-proprietors and unincorporated businesses.

4 Empirical Objectives

Given the multi-faceted interaction between entrepreneurial endeavors and family transmission of wealth, we argue that the basic version of the question – "does entrepreneurship facilitate social mobility?" – is incomplete. Yes, we want to know whether households who own businesses are better able to climb the social ladder. But an affirmative answer still conveys only limited information. After all, being drafted into professional sports leagues or starring in big-budget movies meets this criterion as well. The reason we don't talk about the NFL or Hollywood as engines for social mobility is that they are necessarily ultra-selective and thus inconsequential in macro-scale mobility patterns. Might entrepreneurship play a similar role? The second question therefore is: "how much explanatory power does entrepreneurship have in social mobility outcomes?" Finally, we ask: to the extent that there are systematic patterns to be found, "which households are more likely to benefit from this avenue?"

Addressing all three questions involves a multi-pronged empirical approach. A key element throughout is that we exploit *inter-generational* changes in *wealth* standing. We first look at transition matrices, namely the probability that an individual shifts up or down the wealth distribution relative to where their parents

were. In addition, to get a sense for how likely one is to actually avail of these transitions, we also look at the density of data at the various nodes. This naturally leads to asking what the odds are that a wealthy entrepreneur came from a poorer (equivalent/ richer) household? We address this by looking at a conditional transition matrix wherein we compute the probabilities of having coming from a particular wealth quintile conditional on being observed at certain point of the wealth distribution. Second, we look at not just the averages as captured in the transition probabilities, but also at the distribution of the changes in wealth decile between parents and children. Third, we employ regressions to look more formally at the effect of entrepreneurship on wealth accumulation. In these regressions, we attempt to say something more pointed by exploiting the difference in wealth accumulation across siblings that make different occupational choices. Finally, in keeping with the literature, we look at how entrepreneurship affects inter-generational wealth elasticities. All components of our analysis are run across different cuts of the data depending on what specifically we seek to learn.

We now discuss the rationale that underlies our focus on wealth, rather than income or consumption, and on inter-generational rather than inter-temporal assessments. At the core of our paper is the desire to understand welfare and what facilitates access to increased well-being.

Welfare, or at least, financial welfare can be measured using income, consumption, savings or wealth. Observed over the correct time frame and absent measurement issues, all three measures should result in the same conclusion as to the role of entrepreneurship in wealth creation. Changes in welfare can be assessed by looking at changes in any of these measures over time - either within a persons' lifetime (inter-temporally), or across generations (inter-generationally).

Our focus on wealth rather than income or consumption derives primarily from the data limitations we face. First, none of the datasets we have available to us, even long panels such as the PSID, would allow us to observe individuals over their entire lifespans. As such, a focus on income or consumption, both flow measures, are subject to transitory changes that may not be reflective of overall well being. Furthermore, if we focus solely on immediate returns we may miss or mis-attribute delayed returns from entrepreneurial activity. Second, income is particularly biased in ways that relate systematically to occupational choice.[10] For these reasons, we focus on the only stock measure available to us, wealth.[11]

[10] See Sarada (2015), Hurst et al. (2014) and Pissarides and Weber (1989)

[11] Look at footnote 3 in Charles and Hurst - "Standard life cycle models of wealth accumulation suggest that wealth depends on

This emphasis on wealth leads us to then concentrate on inter-generational, rather than inter-temporal changes in welfare. Since wealth is a stock measure, it makes most sense to compare wealth standing at points wherein they are stable and reflect a substantial portion of the gains one can hope to amass over their lifetime. Given this, we look to comparing the wealth standing of children between the ages of 40 and 55 – when wealth is arguably stabilized – to the wealth ranking of their parents at the same stage in their lives. While defensible for a variety of reasons, it is important to bear in mind that inter-generational analyses risk conflating the role played by personal traits and non-financial resources with that of employment and investment choices, since we are not able to make use of individual fixed effects. Instead, we rely on controlling for parent and child observables and comparisons across siblings who make different employment choices. In addition, it is important to note that while the assessment of inter-generational wealth standing is one way to assess welfare changes, it is not necessarily the only or even best way to measure wealth building. One could as easily argue that wealth changes within a lifetime are as important to utility. This nuance should be kept in mind in thinking through the implications of our findings.

5 Data, Entrepreneurial Definitions and Summary Statistics

Our primary analysis employs the Panel Study of Income Dynamics (PSID) dataset – a longitudinal survey which has been tracking households and their offspring since 1968, recording family composition and status, work circumstances (including hours, pay, whether self-employed, industry, etc), education, health care, housing, consumption patterns, etc. Starting in 1984, the survey also collects detailed financial information.

Because all individuals born to households in the survey are tracked when they establish households of their own, we are able to connect employment, income, and wealth realizations across generations, comparing offspring to their parents and grandparents, as well as siblings and cousins.

The survey started with two samples: one that is representative of the US population at the time (SRC sample, consisting of 2930 original families), and one that oversampled low socio-economic status families (drawn from the US Census Bureau's SEO sample, consisting of 1872 initial households, primarily African American families). Since entrepreneurial participation and outcomes vary strongly with race, we choose to

(1) the level of lifetime income, (2) the trajectory of lifetime income, and (3) the propensity to save out of given lifetime income levels and trajectories (see Modigliani and Brumberg (1954); Friedman (1957)). Extensions to the basic model argue that the expected future variance of income matters as well – Deaton (1989),Carroll and Weil (1994).

manage the number of moving parts by focusing on the core representative (SRC) sample in this paper. In a future project we plan to use the disadvantaged (SEO) sample to explore racial differences.[12]

What this data lacks in number of observations, it makes up for that in detailed household information, thus in some ways presenting benefits even over the comprehensive IRS data.

Entrepreneurial definition

Two main variables are available in the data, by which we can classify entrepreneurs: whether the individual is self-employed, and whether they own (part of) a private business.[13] The two criteria have imperfect overlap and it is not obvious *a priori* whether one is strictly preferable to the other. Thus, we will investigate both.

Two further dimensions are found to be helpful: the incorporation status of the private business, and duration in either self-employment or business ownership.

6 Cross sectional link between wealth and entrepreneurship

Micro-level US data reveals a strong cross-sectional correlation between wealth and entreprenership, as illustrated by figure 1. Rates of both self-employment and business ownership rise steeply with net worth: while less than 5% of the households in the bottom quintile have a self-employed adult family member at any given time, the rate goes up to 8% for the middle quintile, and then increases even more dramatically to around 35% for the top decile excluding the top 1%, and 55% for the top 1%. Business ownership is also positively associated with household wealth, and the dependence is particularly striking for *incorporated* businesses: while at most 2% of households in the bottom half of the wealth distribution own a stake in a private corporation, the rate is around 12% for the 9th decile, 23% for percentiles 90 to 99, and 50% (!) among households in the top one percent.

This initially observed pattern is driven by multiple factors, some of which may simply be compositional – for instance, both wealth and entrepreneurial propensity increase with age, and age is not explicitly

[12] We do not employ the smaller samples added later (latino and immigrant waves).

[13] While self-employment is determined at the individual level, business ownership is asked at the household level. To maintain consistency, we will typically aggregate self-employment to the household level as well (hence the notation "HH") after some variables.

considered in the cross-sectional wealth ranking. It could also be that the link between self-employment or business ownership and wealth is transitory and does not result in lifetime changes in social ranking.

To investigate further, table 1 summarizes entrepreneurial activity over one's youth (18-40), along with demographic characteristics, by realized wealth ranking as measured during middle age (40-55). Among households that end up in the bottom wealth decile there is a 31% chance that a spouse was self-employed at some point. However, the average share of years during which someone was self-employed was only 8%. For households in the top one percent, the odds that someone tried self-employment are higher, but by a factor less than 2 (56% vs 31%), and are not increasing as dramatically with wealth at the top. However, in any given year these households have a 30% chance of having a self-employed household member, which is almost 4 times as high as households in the bottom decile (30% vs 8%). In other words, the association of self-employment with wealth goes along both the extensive and intensive margins: wealthier individuals are more likely to have ever been self-employed, and conditional on attempting, are likely to have persisted in self-employment longer. The same pattern holds for business ownership, and is further amplified for businesses who achieved incorporation status: the average share of time spent as an incorporated business owner is *twenty-five* times higher for the top 1 percent than for those in the bottom decile. Figure 2 illustrates these patterns graphically.

The last few columns of table 1 report average demographic indicators: schooling completion rates, race, and parental wealth decile.[14] The direction in which these vary is hardly surprising, but the *degree* of variation bears mentioning: for households who are below median wealth during middle age, college completion is around 15%. By contrast, 4 out of every 5 individuals in the top 1 percent finished college. In an even more dramatic pattern, 18% of bottom decile households are African-American, but only 1 % of the top decile ones are. Other minorities appear to include both disadvantaged groups and more successful ones. The last column reveals that households who end up higher in the wealth distribution tend to come from wealthier parent families – the average parent wealth rank for a top 1% family, for instance, is the 84th percentile. This is hardly surprising, but it does bring into question the link we are attempting to establish from entrepreneurship to wealth accumulation. Looking only at outcomes is evidently not sufficient – we

[14] In couples, this is the parental wealth of just *one* family member – whoever was born into the PSID sample. We do not restrict gender, and in informal tests we found that wealth is transmitted similarly through sons and daughters. Assortative mating likely plays a part as well, ensuring that in-laws have similar socio-economic status.

need to examine the way households *transition* within the wealth distribution.

7 Does Entrepreneurship Help Build Wealth?

7.1 Suggestive evidence

We've found that people at the top of the wealth distribution are more likely to have owned and operated their own business, and done so for longer. But on average, they also come from wealthier households. So the question remains of whether entrepreneurship itself facilitates upward mobility.

We begin by examining mobility in the sample overall. Table 2 shows the proportion (in percentage points) of individuals from parental households in each of the 5 wealth quintiles (listed in rows) who end up in each of the 5 quintiles (listed in columns). For instance, we find that an individual with parents in the bottom quintile has a 7.7% chance of ending up in the top quintile.[15]

Next, we ask whether mobility differs by self-employment or business ownership. Table 3 splits the sample into individuals who were never self-employed (left), who did so only briefly (middle), and those who were self employed for at least one fifth of their young working years (right), and report transition probabilities within each subsample. Since a brief stint may indicate necessity entrepreneurship or a failed venture, we expect outcomes to be relatively poor for the individuals in the middle category. Indeed, longer self-employment tenure is associated with much higher odds of moving up and lower odds of sliding down the wealth distribution. Outcomes from brief self-employment are broadly on par with those of individuals who were never self-employed. In other words, while persistence in entrepreneurship is rewarded, limited incursions are not always penalized – at least, not for those starting in the 3rd quintile or higher.[16]

Table 4 divides the sample by business ownership and type of business. It becomes obvious that owning an incorporated business predicts outcomes which are superior not just to unincorporated business ownership or to no business ownership at all, but also to prolonged self-employment (compare the right-most panel in tables 3 and 4). Owning a stake in a private corporation puts the odds that someone from the bottom

[15] Our findings are consistent in magnitude with other recent US ones in the literature, for instance by Chetty et al. (2014b). However – since we look at wealth rather than income – we estimate more stickiness at the top and bottom of the distribution than they do).

[16] Here we must also remember the limitations of assessing mobility on the basis of quintile shifts, since by definition we cannot observe if a bottom quintile household becomes worse off.

quintile will move up at 84% (1-16%), compared to 56% for non-business owners. Unincorporated business ownership, on the other hand, appears to exhibit a less clear-cut pattern, with some outcomes being worse and some better than for non-business owners.[17]

Note that, just as with prolonged self-employment, incorporated business ownership is associated with movements to the *top* of the wealth distribution, rather than just movements *up*: in a striking pattern, households from below the 20th percentile of wealth have a 27% chance of ending up above the 80th percentile – the same odds as a household which started in the top quintile but owned only an unincorporated business. Families from the bottom quintile who did *not* own a business at any point have only a 4% chance of making it into the top quintile. What's more, this huge boost comes with no apparent risk, since the odds of ending up in the bottom quintile are also reduced. See figure 3 for an illustration of this remarkable pattern.

7.2 How do the entrepreneurial definitions relate?

In table 5 we show the overlap between the main dimensions by which we define entrepreneurial activity: self-employment and business ownership. Of the 1,983 individuals for whom we have all the requisite information (including their parents' employment and wealth), in 789 (40%) of the cases either they or their spouse[18] has attempted self-employment by the time they are 40 years old. But in just over half of those cases, self-employment lasted less than one fifth of their adult years. Looking at the Total for the rows, we see that almost half (47%) of households owned a stake in a private business at some point, but only 17% ever owned a part of an incorporated business.[19]

We also note that – while they are highly correlated – self-employment and business ownership are not equivalent. Even among households which include a self-employed adult more than 20% of the time, 4% never declare owning a business. This number is much higher (29%) among those with only brief self-employment stints. Conversely, in 88 (so 25%) out of the 345 households who declare owning an incorporated business (and 33% of those with unincorporated businesses) neither spouse ever declares that

[17] Note that unincorporated business owners from the bottom 60% have a better chance of reaching the top quintile than non-business owners. However, unincorporated business owners from the top 40% have a *worse* shot at ending up in the top quintile than non business owners, implying a churning effect among entrepreneurs who never incorporate their businesses.

[18] Throughout most of the discussion we will employ household- rather than individual-level self-employment. This is to mirror the business ownership and wealth data, which are available at the household level.

[19] Some firms become incorporated over time, and some households own both an incorporated and an unincorporated business at the same time – those households are under the "incorporated" heading.

they work for themselves before 40 years old.

The last two lines show that those who spend more time in self-employment are more likely to own a business, but this effect comes solely from incorporated businesses.[20]

In the remainder of the analysis, we will control for time spent in both self-employment and for time spent in business ownership, without explicitly controlling for the overlap. Because in PSID questions about employment and business ownership don't always refer to the same time period, identifying the years when both conditions are met is prone to errors and for now we will refrain from doing so.[21]

To more precisely investigate the difference in outcomes across employment/business ownership modes, we turn to multivariate regression analysis.

7.3 Regression analysis

In our initial regressions, reported in table 6, the dependent variable is outcome wealth percentile,[22] while the main explanatory variables are indicators for self-employment and business ownership. Because entrepreneurial activity correlates with a number of demographic dimensions, we control for a wide range of variables in order to limit any potential bias: in columns 1 and 2 we account for own and parental education, own industry, state of residence during middle age and during childhood, indicators for being a 2nd or 3rd generation immigrant, race fixed effects, [23] birth year fixed effects, gender, and (average) age when wealth was measured.[24] What's more, starting in column 3 we control for parental wealth with individual indicators for each centile. In *all* specifications, we control for the share of young working years when someone in the household was unemployed, and the share of years when someone was out of the labor force. We do this in order to prevent the introduction of a mechanical positive bias, at the risk of attenuating our coefficients.

[20]The odds of owning only unincorporated businesses is roughly the same (50% vs 51%) for households with less time (<20% yrs) in self-employment than for those with more. However, the odds of owning an incorporated business more than double (21% vs 45%) with persistence in self-employment.

[21]We considered interacting the self-employment and business ownership variables at the individual level (collapsed across years), but found that it was not predictive.

[22]At this stage there is no inherent reason for using rank rather than nominal outcome, since we are not explicitly asking about *relative* mobility. We choose rank rather than logged wealth so as not to lose negative and zero values. The general take-aways of the analysis are unchanged regardless of the measure.

[23]Because race is recorded imprecisely and we have a limited number of observations, we utilize just 3 categproes: white, African American, and an "other" category grouping all remaining races and ethnicities together.

[24]Because of the way we construct wealth ranking – by comparing individuals within narrow age groups – the age and age squared variables are not significant in these regressions. We include them to ensure consistency with later log wealth elasticity estimates, and also as a way to check that the rank is computed as intended (meaning that we expect the coefficients on these variables to be insignificant).

Initially (col 1) we include only self-employment to indicate entrepreneurship, and find that a household wherein at least one adult was even briefly self-employed before 40 is predicted to end up 2.65 percentiles higher in the wealth distribution, as measured between 40 and 55 years old. Once we account for business ownership, however, self-employment ceases to matter from a statistical standpoint. Instead, we find that business ownership predicts a half decile higher placement in the wealth distribution (col 2). However, a case could be made that the result is driven by the fact that business owners benefit from greater parental resources – be they wealth, reputation, entrepreneurial know-how, etc. In column 3 we add further controls intended to account for such parental factors: fixed effects indicators for parental wealth percentile, the share of years when the mother was married, both the mother's and father's education level, as well as indicators for the main working parent's business ownership, self-employment, and modal industry of employment. Inclusion of these variables reduces our sample slightly and increases the number of independent variables substantially, nonetheless the estimates of the main coefficients (self-employment and business ownership) remain remarkably stable.

So far our target variables have been the simple binary indicators for self-employment and business ownership. But – as with everything else – we expect returns to increase with the level of engagement in entrepreneurship if it is indeed this channel that allows for wealth building. Thus, we include controls for being self-employed a non-trivial number of years (at least 20% of the time) and for owning a corporation – rather than a sole proprietorship, partnership, or another unincorporated form. Adding these controls has the added benefit for eliminating potentially confounding effects of personality: for instance, perhaps less risk averse individuals are able to amass greater wealth on average simply because they take greater risks in whatever they do; these their risk tolerance also makes them more likely to try entrepreneurship. If this was in fact the primary channel, there is no reason to expect for instance that prolonged self-employment is any more predictive of wealth than self-employment is in general.

In column 4 we introduce these additional controls of more intensive entrepreneurial and, remarkably, we find that they completely absorb the previously observed positive correlation with wealth. For instance, although having a self-employed household member at least 20% of the time is associated with 4.3 centile higher wealth rank, a shorter duration is associated with at best zero and at worst negative outcomes. The same broad pattern holds for business ownership: incorporated businesses predict an almost full decile better

placement in the wealth distribution, whereas owning exclusively unincorporated businesses predicts a mere centile increase, and very noisily at that.

Nonetheless, even though we control for the level of parental wealth, education, the broad sector, whether they owned a business or were self-employed, etc., all these variables are fairly crude – not distinguishing for instance between college degrees from Ivy Leagues vs low-ranked universities. We believe the combination of all these measures of parental resources does add up to a full pictures, even if each variable on its own is imperfect. But there is a way to make *sure* we account for all relevant parental characteristics – and that is by accounting for the parent. One of the advantages of the PSID dataset is that it allows us to track families from generation to generation. We restricted the sample to individuals born between 1950 and 1973, which means they were either minors in their parents' household when the data collection began in 1968, or were born within the following 5 years. A majority of these individuals have siblings who are also in the data, thus allowing us to control for each individual parental household. This is precisely what we do in the last two columns of table 6. To be specific, we introduce individual fixed effects for each subject's main working parent (usually the father if present), thus effectively comparing paternal siblings against each other.[25] This quasi-experimental evidence – while less precisely estimated – also strengthens our findings: column 5 reports that,in families where such variation exists, the sibling who owns a business at some point is predicted to end up 3.9 percentiles wealthier than the sibling who did not. This coefficient is very close to the analogous 4.6 percentile predicted by column 3, although as expected standard errors are much larger. In the last column, we again introduce the indicators for prolonged self-employment and incorporated business ownership, thus mirroring the specification from column 4. And once again, the fixed effects estimates are very similar to the OLS ones: the sibling who owned an incorporated business could be expected to end up 6.8 percentiles higher than the sibling who did not – lower numerically, but not statistically, than the earlier estimate of 9.4,[26] even after controlling for education, industry, time in the labor market, etc.

[25]The sample in this case is restricted only to individuals with one or more siblings in the data. Alternatively, we can introduce fixed effects at the level of the original household–which allows us to use a slightly larger sample–but results are essentially identical.

[26]There is no indicator in the data for whether the firm was inherited, but based on other studies, the share of families who run an inherited business is quite small (around 2 percent). We also run the analysis from table 6 but using rank based on wealth without the net value of private businesses, and find slightly smaller coefficients but unchanged qualitative results (see table 23 in the appendix.)

Overall, estimates presented in table 6 strengthen the case made by figure 2 and tables 3 and 4: first, entrepreneurs do indeed amass more wealth. Second, this is unlikely to be driven by some other correlate – including parental household. And third, the degree of wealth building is linked to persistence in self-employment and/or incorporation.

7.4 Beyond the transition matrix: does everyone have equal access?

Earlier we reported wealth quintile transition matrices, which showed the high likelihood of making it into the top 20% for even the entrepreneurial households starting in the bottom quintiles. But these transition probabilities only tell half the story, since they condition on already *being* an entrepreneurial household.

In figure 4 we seek to present the bigger picture, by indicating the number of households in each transitional category through the area of the circle. The sample is split so that the left panel includes both non-business owners and households who owned an *un*incorporated business only, while the right panel includes only households who owned an incorporated business at some point. Examining the top row, we notice that, although the offspring of bottom quintile parents tend to have very good outcomes if they own an incorporated business (i.e. are in the right panel), only a small minority of them ever do so. We capture some of this differential selection issue by reporting the transition matrix *backwards* in the bottom panel: here we list retrospective probabilities, showing for example that a business-owning top quintile household has a greater than 50% probability that their parents were in the top quintile as well, whereas among households who don't own an incorporated business, those who end up in the top quintile have a nearly 70% chance of having climbed up the ladder themselves. Figure 5 conveys the same information as figure 3, plus the relative size of the category subsamples through the marker areas. Just as with the transition matrix, this additional piece of information changes the interpretation substantially. Viewed from this new angle, business ownership appears to be less a channel for mobility and more a tool for wealth consolidation.

Figure 6 is another attempt to visualize the interplay between wealth transmission and entrepreneurship: it shows the share of households who are business owners, at each point in the transition matrix. Informally, we can verify that in order to move *up*, it helps to own a business, in particular an incorporated one. Of those who climb into the top quintile – starting from any point along the distribution – less than half do so by wage work alone. Among households who are top quintile stayers (meaning that both their parents and

they themselves place in the top 20%), more than half own an incorporated business; by contrast, only 4 percent of *bottom* quintile stayers do.[27]

Figure 7 and table 8 report cuts of the data by parental wealth, to mirror the earlier summary statistics by own wealth. As we can see, the pattern of positive correlation between entrepreneurship and wealth is again present, in particular when it comes to prolonged self-employment and ownership of a corporation: 2 out of every 3 children of families in the top 1 percent own a piece of an incorporated business, as compared to only 1 out of every 10 children born in the bottom 40 percent. In other words, while it is true that business owners tend to end up much higher in the wealth distribution, they also typically start higher.

This is potentially concerning. Given this restricted access, entrepreneurship may indeed stifle – rather than facilitate – overall mobility. Before we jump to conclusions, however, we expand our analysis in the following directions: we will investigate whether access is enabled indeed by parental wealth – as opposed to other, more meritocratic – factors. We will ask who are the groups most helped through this channel: who gains access and who does well, conditional on access. Finally, we will ask whether these groups experience higher relative mobility, and whether this has an effect on the aggregate churning in the economy.

First, however, we want to test whether entrepreneurship *matters* from an explanatory standpoint for wealth outcomes.

7.5 Does entrepreneurship help explain sample variation in wealth outcomes?

We found that business ownership is associated with better wealth outcomes for households from all rungs of the ladder, but access is highly selective by parental wealth. So does entrepreneurship actually make a difference? One way to approach this question is to ask how much of the variation in realized wealth is explained by entrepreneurial controls.

Table 7 reprises the outcome wealth rank analysis, this time holding the sample fixed and attempting different OLS specifications, with the goal of making direct R^2 comparisons. It turns out almost one third of the total variation in outcome wealth decile is explained by observable exogenous factors (see column 3). Adding in marital status, state in which one settled and modal industry improves explanatory power, bringing the R square to 0.43. In the next 3 columns we introduce individually controls for education

[27] In the appendix we present a similar view of this joint distribution, through scatter plots that portray all individual households in the sample, both in logs and in rank, once again grouped by business ownership.

(col 5), time spent unemployed or outside of the labor force (col 6), and indicators for self-employment and business ownership (col 7). Interestingly, these 3 components each contribute a similar amount to the model's explanatory power: education explains an additional 2.4%, employment an additional 2.6%, and entrepreneurship 2.2%.[28] Finally, we include all these controls in the last column: this is simply the specification from column 4 of table 6.

Naturally, many of these indicators are correlated with each other and we cannot draw quantitatively-specific conclusions from this analysis. However, a handful of interesting patterns bear mentioning: first, basic demographic descriptives along with parental wealth rank are sufficient to explain 29% of variation in own outcome wealth.[29] Second, adding several other parent characteristics which we generally deem important (education level, average marital status, industry, etc) explains only a small additional fraction of variation (.025). We don't take this to mean that factors such as parental education are necessarily unimportant, but rather that they are so tightly linked to wealth standing that we do not see them make a difference in practice. Third, some very basic personal choices (marriage, state, and industry) explain much of the remaining variation.[30]

Fourth, other choices people make (more or less freely) have a relatively small impact: education, years worked, and self-employment/business ownership have comparable explanatory power, with each between 2.2 and 2.6 percentage points of the remaining variation in accrued wealth. This makes for an interesting dilemma: is entrepreneurship simply not relevant to households' outcomes? We certainly think education and sustained employment matter. As it turns out, the similarity is not accidental: just as a 4-year degree opens new doors for the child of a working class family, business ownership has the potential to do the same. In both cases, however, access is limited.

[28] We introduce them separately at first because they are correlated.
[29] As a matter of fact, parent wealth *alone* accounts for 22.6% of variation (regression not reported).
[30] Average marital status is by far the most explanatory.

8 Who benefits from entrepreneurship?

8.1 What explains differential access?

We have seen that participation in entrepreneurship is heavily associated with higher parental wealth. But this does not mean that it is *driven* by parental wealth, although that is certainly one of the possibilities. There are three broad alternative scenarios we will try to distinguish between:

1. Starting a business is costly for a number of reasons, and given the imperfections in credit markets, parental wealth confers a large advantage.

2. Wealthy parents are more likely to be business owners themselves, and we know offspring are disproportionately likely to follow in their parents' occupation. Occupation stickiness in entrepreneurship, in particular, is high because of inherited values, specific knowledge, networks, etc.

3. Wealthy parents have higher general human capital, as embodied by both innate ability and formal education, and high human capital households are more likely to overcome the hurdles to entrepreneurship.

Distinguishing between these 3 channels is important because they have vastly different policy implications: if channel 1 dominates, that would in general suggest that credit access is a disproportionate hurdle to entrepreneurship and we may consider expanding loan guarantee programs such as those offered by the Small Business Administration.[31]

If channel 2 dominates, that would suggest that we need to expand our entrepreneurial-education programs, along with initiatives that help would-be entrepreneurs navigate the practical aspects of setting up a business, including obtaining permits, connecting to suppliers and distributors, etc.

If channel 3 dominates, we would want to distinguish between formal education and innate ability. Access to formal education regardless of initial resources is already recognized as an important policy goal. If, on the other hand, *ability* is what drives differential access to entrepreneurship, this would indicate a meritocratic system. The policy implications are less clear, and may in fact be to do nothing.

[31] Here, it will also be important to know at what point in the wealth distribution the advantage kicks in – to establish if corrective public policy is even feasible.

Before exploring these channels in earnest, we test the underlying premise supporting channels 2 and 3: are wealthy parents more likely to have been entrepreneurs and to have had higher human capital? Table 9 shows summary statistics by parental wealth, similar to table 8. Here we see that wealthier parents were indeed much more likely to be business owners: over three times as many parents in the top decile owned a business at some point, compared to parents from the bottom decile.[32] Parental ability and education are also positively linked to wealth: for instance, fathers in the top 1% were more than 10 times more likely to have finished college than those from the bottom decile. This means channels 1, 2 and 3 are all plausible mechanisms to explain why individuals with high initial resources are much more likely to enter business ownership. Thus, we proceed with trying to tease out their relative importance.

The next questions to ask are: first, are human capital and parental experience predictive of business ownership (i.e. do channels 2 and 3 play a role)? If so, does this hold for all parental wealth levels? Third, is parental wealth still predictive of business ownership after we've accounted for parental experience and human capital (i.e. does channel 1 play a role, in addition to channels 2 and 3)?

Table 10 shows that the children of business owners are generally more likely to be self-employed or to own a business, although the difference across these categories is not as stark as with respect to wealth: 40% of the children of non-entrepreneurs ever own a business, whereas 55% of the children of entrepreneurs do.

On the other hand, the extent to which education predicts entrepreneurial ambitions is less clear: in table 11 we see that self-employment does not have a strictly positive correlation with education level: those with only some college or with post-graduate education are somewhat more likely to try self-employment than the other categories, but all are within the 37-45% range. Business ownership does increase monotonically with education, but the differential is only pronounced once we look at the intensive margin – the ratio of business ownership attempts between those with post-graduate education and high-school dropouts is less than 1.4 for attempt (any business ownership), 2.4 for length in business ownership, 3.4 for attempt at incorporated business ownership, and 5.7 for duration in incorporated business ownership.

Tables 11 and 29 have thus shown that there is some positive correlation between human capital and entrepreneurship, but it is only substantial when it comes to corporations – precisely the type of venture we found to be associated with the largest wealth gains. This is then our best shot at finding a merito-

[32] This seems obvious given that the same pattern exists in their children's generation, but the comparison seems worth making given concerns about decreased opportunity and increased inequality.

cratic system at play: perhaps highly educated or talented individuals truly have a better shot at owning an incorporated business, even after controlling for other factors.

The graphs in figure 8 look into precisely that question. In each case the quantities being plotted are the percentage of households within the respective category who owned an incorporated business at some point. The first panel on the left reprises a pattern introduced earlier, this time grouping the observations by parental wealth quintile for the bottom 80% and decile for the top 20%. As we've seen before, the rate of incorporated business ownership climbs at first linearly with parent wealth rank, doubling from around 9% for the bottom quintile to 18% for the fourth quintile. The rate of increase rises slightly over the next decile, then spikes for the top decile. From the 9th to the 10th decile the increase in the frequency of incorporated business ownership increase 17 percentage points (from 26% to 43%), the same absolute increase as from the bottom quintile to the 9th decile (9% to 26%).[33]

The middle panel shows us that parental business experience is predictive of entrepreneurship even after we control for wealth (although perhaps not at the top of the wealth distribution). Conversely, parent financial resources continue to be highly predictive even after we account for parental experience – although it is worth noting that there is some variation in the wealth level beyond which resources matter most. For instance, for individuals whose parents were *not* business owners, increased wealth is particularly impactful in the top quintile, and comes close to erasing the parental experience advantage for the top few centiles.

The right-most panel of figure 8 shows us a similar pattern: formal education increases the odds of owning an incorporated business even after we account for parental wealth – although only college graduates have strictly higher odds at all levels of parent wealth. Similarly, parental wealth continues to be highly predictive even after we accounting for education.

Figures 9 and 10 examine the interaction between the role of parental experience and that of education. It turns out that having business owning-parents confers an overall advantage only to college graduates, and only up through the 9th decile. Similarly, a college degree is particularly helpful only if the parent was an entrepreneur, increasing the odds that one owns an incorporated business by between 7 and 13 percentage points, depending on starting wealth.

But, formal education is just one measure of human capital. For a subset of the sample, as discussed,

[33] We know from earlier analysis that there is another large jump for the top 1%, but omit that distinction here.

we have the scores from cognitive tests of the household's children. The problem-solving score was found to be particularly indicative of financial success, and is thus used as a measure of that household's ability. Before we ask whether this IQ score predicts participation in entrepreneurship, we might test its validity by asking whether it is predictive of some more obviously linked outcomes. Figure 11 shows not just the rate of incorporated business ownership, but also the rate of college completion, against IQ, by IQ decile. The left-most panel shows that both these outcomes are positively associated with ability, although college degree is much more so. However, we know that general intelligence has a substantial genetic component - and presumably higher ability among the parents' generation allowed them to amass more wealth on average. And wealth, of course, enables both entrepreneurial activity and formal education.

So a basic test we can conduct is whether the positive association between IQ and college/business ownership still holds when we control for wealth. The next 2 panels split the sample into the bottom and top 50% of parental wealth. Examining the middle and right-most panels of figure 11 we note that, while increased ability is associated with higher college completion rates, the same cannot be said for incorporated business ownership. In fact, the rightmost panel reveals virtually no correlation between ability and entrepreneurship once we conditioned on being above median parental wealth. [34].

It is remarkable that even this very crude distinction into above- or below the median resources eliminates nearly all the correlation between IQ and incorporated business ownership. In fact, that point is demonstrated even more strongly if we control for education rather than treat it as an outcome: figure 12 illustrates how, conditional on education level, ability has a virtually zero overall correlation with incorporated business ownership.

Complicating matters further, there are non-trivial interactions between human capital and parental experience in determining engagement in entrepreneurship.

While these graphs and statistics have been suggestive, they are limited in the number of dimensions they can account for at any one time. We use regression analysis in order to identify the factors most predictive of entrepreneurial participation; how *do* parental households ease the path to entrepreneurship for their offspring? Table 12 regresses indicators of entrepreneurial activity (business ownership and incorporated

[34]The only remaining link is at the extremes of the ability distribution: someone with above average resources but in the bottom 10% of ability has much lower odds of owning an incorporated business than the rest of his well-off peers, and on par with most children of below-average means. Similarly, among individuals coming from below-average parental wealth, only the top 2 deciles by IQ have similar odds of owning a corporation as the group of above-average means.

business ownership)[35] on parental business ownership, as well as parental wealth and the usual demographic controls. We find that for all categories considered, parental experience is a plus.[36] There are hints that experience within the same sector as their offspring is particularly helpful, but estimates are noisy and not reported here.

Both the children of business owners and college graduates appear to have higher odds of owning an incorporated business; in column 6 we determine that only the *interaction* of the two enters positively, even though when it comes to more generic business ownership (column 3) non-college graduates benefited equally from parental experience. This speaks to the fact that owning a corporation requires *both* formal education *and* less-easily formalized know-how (since the coefficient on the stand-alone college graduate term in column 6 is zero), consistent with our graphical representations.

This is consistent with our graphical representations – as are the coefficients on the top decile and top centile in columns 4-6. In a sample where the dependent variable has mean 0.177, having parents in the top decile has a coefficient of .17 even after controlling for parental experience. Having parents in the top 1% has an effect almost double the sample mean. Note also that the magnitude of these coefficients barely changes from column 4 to 5, which makes it unlikely that the apparent effect of wealth is in fact driven by some unobserved family business (such as that of the in-sample individual's in-laws). Equally remarkable is that there are no measurable effects of parental wealth below the 10th decile.

Complicating the interpretation of the interaction between college degree and parental experience is the fact that education is chosen by the individual, and may be driven by some of the same factors (e.g. parent's career) as the decision of whether or not to start a business. [37]

The fact that parental wealth does not seem instrumental in owning *a* business (when including those unincorporated) leads us to believe that – consistent with the findings in Buera (2009) – credit constraints introduce inefficiencies primarily along the *intensive* rather than the *extensive* margin: individuals are able to work for themselves or start a small-scale business but, – lacking abundant financial resources – they will typically not be able to invest enough to turn the business into a significant vehicle for wealth creation.

[35] For a similar analysis that also includes self-employment, see tables 26 and 27 in the appendix.

[36] We investigated whether parental experience interacts with wealth in a meaningful way, but could not measure a significant effect.

[37] In fact, there is evidence that college graduation is in part driven by parental entrepreneurship: see figure 13 and table 19, which will be discussed later.

There will always be, of course, exceptions to this general pattern, and in order to judge the ultimate value of the entrepreneurial mechanism we need to dig into the details.

An important question is whether other factors beyond parental wealth and experience is predictive of access to *impactful* entrepreneurship. Table 13 analyzes the effect of ability on incorporated business ownership (cols 1-3) and on being self-employed more than 20% of the time (cols 4-5). In the first regression we find that one standard deviation higher IQ is predictive of a 3 percentage points increase in the probability of owning an incorporated business. However, as soon as we account for education level, the link to IQ is all but gone. Adding any number of other controls doesn't change things substantially.[38] With regard to self-employment, ability is not significantly predictive even if we don't account for education. Note that we did not include the corresponding regressions of general business ownership and self-employment indicators, since those are even less linked to ability.[39]

Before moving on, a quick review of the results from this section: we found that family background – both entrepreneurial experience and financial resources – play a significant part in predicting who will become an entrepreneur. Parental wealth within the top decile and top 1 percent, in particular, is highly predictive of incorporated business ownership.

Human capital matters as well – to a smaller degree – but is manifested mainly through the level of formal education, which is itself linked to parental business ownership. Innate ability, while predictive of higher levels of education, has no other measurable link to participation in entrepreneurship.

8.2 What characteristics predict success in entrepreneurship?

We saw in section 8.1 how parental experience, parental wealth, and (to a lesser degree) human capital influence whether or not someone becomes an entrepreneur. We also reported earlier in section 7.3 how some of these characteristics predicted wealth outcomes, independent of entrepreneurial activity. What we have not yet explicitly asked is whether any of these dimensions play a differential role in attaining success

[38] If we introduce this in a parent fixed effects regression, the coefficient is *negative*, although not statistically different from zero.

[39] In unreported analysis, we tested whether ability matters differentially by the level of education – although errors are large so inference is limited, results suggest that ability is relevant in incorporated business ownership only for non-college graduates. In other words, formal education can serve as substitute for innate ability in this case. We also tested the interaction of ability and parental entrepreneurship, but the interaction effect is zero.

(as measured by outcome wealth) through entrepreneurship (as opposed to other forms of employment).[40]

figure 13 plots college graduation rates (horizontal axis) and incorporated business ownership (vertical axis) by parental wealth rank category (bottom 4 quintiles and top 2 deciles), and indicating average ability through color coding and the 2nd label, after splitting the sample by parental business ownership. Each category is marked with the rank parental wealth and, below it, the share in percentage points of households with IQ in the top 10% of the sample.and table 19

In table 14 we return to analyzing outcome wealth deciles, but this time – given the importance of parental entrepreneurship we found in the previous section – we interact key variables with indicators for whether the parent was self-employed or owned a business at some point. We expect parental business ownership to predict better outcomes for entrepreneurs, although it is not clear whether or not it will also do so for wage-employed children. For simplicity, we consider business ownership, but we find similar results using self-employment. In column 1 we find, as before, that business ownership is predictive of substantially higher wealth outcomes (by almost 5 centiles). Parental business ownership appears to be a liability, as it predicts wealth to be 3 centiles lower. In column 2 we separate individuals by college completion. The positive association of business ownership is the same across education levels, although parental entrepreneurship stops being relevant for college graduates. This is an interesting finding, since it indicates that 1st generation entrepreneurs have an equal shot at upward mobility regardless of education level. As for the children of business owners, they lose ground only if they neither pursue entrepreneurship, nor acquire a college degree. Interestingly, parent business ownership is associated with lower wealth placement,[41] although own business ownership offsets that coefficient.

The picture changes in a notable way, however, as in the following 2 columns we introduce an interaction term between own and parental business ownership. 1st generation entrepreneurs stand to gain much less (possibly zero) on average from business ownership. Education is relevant now: although noisy, there does appear to be a positive link between business ownership from non-entrepreneurial families *if* the indi-

[40] In one sense, the regressions of incorporated business ownership or prolonged self-employment *are* also partial tests of success, since one would imagine that poor performance is often what keeps business owners from incorporating or from persisting past the first year or two. To the extent that's true, we have already found that parental experience and resources very much enable success, even though the barriers to nominal business ownership are low. We want to go beyond this measure of success, however, and assess outcomes in the form of wealth accumulation.

[41] Note that in all these specifications we control for parental wealth (centile fixed effects). If we remove the parental wealth variables, parental business ownership is no longer predictive (when un-interacted), indicating that wealth accrued through private business is in a way more susceptible to loss.

vidual has a college degree. On the other hand, non-graduates only have improved outcomes if their parents were business owners, and even then the positive coefficient from the interaction is nearly overwhelmed by the negative one on the stand-alone parental entrepreneurship variable. To verify this somewhat surprising finding, we ran the same regression using logged wealth rather than rank (also controlling for log parental wealth and its square). As column 4 shows, this changes results somewhat. Non-college educated individuals still need to draw upon parental experience to be successful in entrepreneurship, but this does allow them to reach greater wealth than their counterparts from non-entrepreneurial families. This difference between the findings in columns 3 and 4 is due partly to the difference in wealth measures and partly to the difference in sample composition, since using logs removes observations without positive wealth. This serves as a reminder that empirical choices as innocuous as the unit of measurement or how to handle missing values can affect analysis results. It also raises some alarms in light of our inquiry into relative mobility, since the observations excluded from the column 4 regressions mark precisely the lowest wealth households – an issue to which we will return in the following section.

Summing up the results of table 14, college graduates who are business owners accrue greater wealth - by around 4 to 5 centiles or 30%, and this amount does not vary significantly by their parents' business ownership background. Non-college graduates, on the other hand, can expect essentially zero gains if they are a 1st generation business owner. If they come from an entrepreneurial family, owning a business predicts substantial gains; however, if they *don't* follow in their parents' footsteps, they are at risk of losing ground (in terms of wealth) to their peers from non-entrepreneurial families. This is consistent with a world in which successful business owners either ensure their children get a college degree, or pass their business on to them. It is also consistent with the idea that formal education can supply the same knowledge and networks needed to succeed in entrepreneurship as those provided by an entrepreneurial family background, and the two are substitutes in entrepreneurial production.

Another way to interpret results in this: although college graduates and non-college graduates stand to gain on average about the same through business ownership, the success of those without a higher degree is conditional on having an entrepreneurial family; whereas college graduates face similar odds regardless of their parents' backgrounds (although family background *does* play a role in whether or not they ever become entrepreneurs).

Considering that formal education is itself a function of parental resources, a perhaps more important question is whether intellectual ability is more able to create value through business ownership. In table 15 we adopt the same basic approach as in the previous analysis, but introduce IQ as a control interacted first with business ownership, then with business ownership separately by broad level of education. Another interesting question is how intellectual ability plays in.[42]

The first column of table 15 demonstrates the relevance of our ability measure: one standard deviation higher intelligence predicts wealth to be almost 3 centiles higher, with high precision and even after controlling for education level – aside from the remaining exhaustive set of controls – and despite the severely reduced sample.[43] Interestingly, we found in separate tests that this estimate persists (and is in fact higher) even when we control for parental fixed effects. We believe this may be because one's children's problem-solving skill captures the ability of both parents, who typically both contribute to the household's wealth building.

In column 2 we introduce an interaction with the business ownership indicator - finding a statistically insignificant (but positive) coefficient. The lack of precision does not exclude the possibility of a real effect, considering the sample limitations.

Next, we distinguish between the effects for broad educational categories: *outside* of business ownership, IQ seems to be predictive of financial success only for college graduates. The coefficient of 7.82, although noisy, implies a large economic effect: a college graduate with one standard deviation higher IQ is predicted to have 8 centile higher wealth (recall that we continue to control for parental wealth centile fixed effects). On the other hand, within business ownership the effects is essentially eliminated. Rather, it is *non*-college graduates of higher ability who stand to gain more from business ownership as compared to others who also don't have a college degree. The effect is relatively smaller although not entirely trivial (1.04+2.87=3.91 centiles)

In the last 2 columns we run the same type of estimation, but switching to log wealth rather than rank,

[42]To establish the meritocratic value of business ownership, general intelligence is not the only relevant criterion. We may think that industriousness should be rewarded, and the PSID data does include hours of work - but they are self-reported and estimates may be skewed if an entrepreneur's perception of his hard work is influenced by success. What's more, hours put into one's business can be driven as much by demand as by his or her supply of labor.

[43]The sample of individuals was drawn randomly from families with children in the target age range, but the survey was run at a different time than the main PSID survey and compliance was imperfect. Therefore households who either did not have children, or had them sooner/later than the rest, or refused to participate in this survey are excluded from the sample.

The same findings carry through by this measure.

Taken together, tables 27 through 15 demonstrate an interesting interplay between human capital (as measured by both ability and formal schooling) and parental experience, with the story being additional complicated by the fact that college completion is a – potentially simultaneous – endogenous choice.[44]

9 What is the effect on relative mobility?

Continuing with our analysis, we arrive at a deceptively simple question: does the vehicle of business ownership mean there is *more* relative wealth mobility, or *less*? First, we will ask whether the sub-sample of entrepreneurs has more or less internal churn than the rest of the sample. For this, we run intergenerational elasticity and rank-rank analyses and find relative mobility to be exactly the same within each employment mode, although as we saw before the sample of business owners has an absolute advantage.

We argue, however, that this approach has the serious limitation of not accounting for the selective access into entrepreneurship.

To deal with this issue, we compare the simulated results from two counterfactual scenarios: one in which we imagine that none of the households in the sample are business owners,[45] and one in which business ownership is predicted from our 1st stage estimates, with parental wealth being restricted to be the same across the entire sample. We discuss our results at the end of this section and in the Conclusion.

In this section we pose two questions: first, what categories of individuals are actually able to access self-employment and business ownership–both on the extensive and intensive margins? And second, conditional on access, what categories are most likely to leverage entrepreneurial activity into wealth growth and social mobility?

9.1 Is there more social mobility among entrepreneurs?

The first question that presents itself is whether mobility *within* the sample of entrepreneurs is greater than within that of wage workers.

[44] Our ability measure is also endogenous even if we think it is not susceptible to the quality of early childhood care, since it depends on one's choice of spouse, which in turn is generally linked to the choice of attending college or of moving to a more urban area.

[45] Here we must emphasize that we are asking a very limited question: we abstract away from any general equilibrium effects or even from more direct potential effects of business owners on non-business owners.

Table 16 obtains estimates for the intergenerational rank-elasticity of wealth, introducing interactions indicators for whether the individual was an entrepreneur, by the criteria listed in column headers: business ownership (col 2), ownership of an incorporated business (col 3), or an unincorporated business[46] (col 4), and finally self-employment (col 5). For each category, we introduce a simple control as well as an interaction with logged parental wealth – if negative, this interaction would suggest that individuals from lower in the wealth distribution are helped more by entrepreneurship. The interactions of parental wealth with the business owner and the *incorporated* business indicator (cols 2 and 3) are not distinguishable from zero, thus suggesting that the business-owning sub-sample is indeed more mobile. Looking in the next columns, there does appear to be increased mobility from unincorporated businesses alone. effect is larger and significant for unincorporated business ownership. Note however that the intercept is zero in column 4, so that the mobility is in the negative direction for households starting in the top half the wealth distribution.

In table 24, reported in the appendix, we go one step further and control for wealth at a very fine-grained level (parent centile fixed effects). The increased mobility in the sample of unincorporated business owners is reduced slightly and rendered insignificant, whereas there is weakly significant evidence that mobility is *lower* in the sample of self-employed.

Also in the appendix (table 25) we report the result from a similar analysis in which we use log wealth instead of wealth rank to indicate both own and parental wealth. This specification is more similar to earlier work on intergenerational elasticities, however it has the drawback that it is nonlinear (hence the inclusion of the squared term).[47] Results are entirely consistent with those of table 16.

Incorporated business ownership and completing college have similar roles: they are much more accessible to those at the top, and provide a boost for all who make it, for all initial wealth levels. However, selection into business ownership varies much more steeply with wealth at the top of the distribution (thus restricted access to the top 10% and top 1% rather than more broadly to the middle class. In addition, there is more internal churning of the sample of college graduates than in the sample of other individuals – as indicated by a flatter rank-rank correlation slope in the right panel of figure 17. We saw that the same is *not* true for business owners.

[46] Here and in similar instances elsewhere, the unincorporated business criterion excludes entrepreneurs who at some point owned an incorporated business.

[47] This is also the argument made in Chetty et al. (2014b), who then proceed to use centile rank.

9.2 Are some entrepreneurs more socially mobile than others?

In table 17 we test whether relative mobility varies with parental and own business ownership – we extend the analysis from table 14 by introducing interactions with parental wealth, in order to test whether the benefits from business ownership accrue disproportionately to those with lower initial wealth. The short answer – similar to what we found in table 17 – is *no*. The self-employed and business owners, whether or not they come from entrepreneurial families, experience no greater churning than the rest of the sample.

Table 18 reports results from a rank-based intergenerational wealth elasticity analysis in which we introduce controls for education and ability, interacting them with business ownership and parental wealth rank.[48] Column 1 introduces indicators for broad educational level, with the excluded category being high school graduates who may have attended college but did not get a college degree. Relative to them, the net worth of high school dropouts during middle age is predicted to be 16 centiles lower, whereas college graduates can expect to place 13 centiles higher. As we saw in table 6, individuals with only a college degree and those with at least some post-graduate schooling are nearly indistinguishable in terms of wealth outcomes in our data, so they are included in the same category here. Those with some college experience but no college degree, on the other hand, look very similar to high school graduates. In terms of wealth level, therefore, the five educational categories can be grouped into 3: high school dropouts, high school graduates (including college dropouts), and college graduates (including post graduate education). In the specifications that follow, we keep high school graduates as the excluded category and introduce indicators for high school dropouts and college graduates.

In column 1 the interaction between the high-school dropout indicator and parental wealth is negative, indicating that this category may be more mobile. However, the intercept coefficient is negative and relatively large (-16 centiles), so this increased mobility is driven entirely by downward movement: people starting higher in the wealth distribution are hurt even more (relative to their peers) by not finishing high-school than those from lower rungs. Considering that only about 5 percent of children with parents of above median wealth don't complete high-school, this does not seem surprising and could be driven entirely by the more severe negative selection. The college graduates subsample *may* have a different mobility rate

[48] Since we determined that self-employment itself does not lead to social mobility in our sample, we focus on the potential of business ownership.

than that of high-school grads who did not finish college: the interaction coefficient between parent rank and college degree is negative across all specifications, but has an equally sized standard error. For context, a -.05 coefficient (if significant) would imply that for someone from the bottom of the wealth distribution the college premium is 5 centiles higher than for someone from the top (since percentile parent wealth is de-meaned before being interacted).

In column 2 we introduce the business ownership indicator, as well as its interaction with parental wealth centile. We find that business owning households place nearly 6 centiles higher on average, and this does not vary negatively with parental wealth, indicating that within-sample mobility is not higher (and may be slightly lower).

Going further, in column 3 we investigate possible interactions between business ownership and education: the coefficients are insignificant, and in any case much smaller in magnitude than the stand-alone coefficients of educational category. Likewise, we find no evidence that mobility is higher among business owners for any of the educational categories.

In the final three columns of table 18 we introduce an indicator for whether the family's children tested above average within the sample. Note that this information is only available for a subset of the observations, hence the drop-off in sample size. Column 4 estimates indicate that, even after accounting for broad educational category and for business ownership, having above-average ability predicts a 7 centile higher net worth. The interaction between high IQ and parental wealth is negative but not significant, leaving open but unresolved the possibility that high ability individuals from lower in the distribution are able to gain more ground. Next, we try to distinguish between the relative mobility of individuals within and outside of business ownership: in column 5 the interaction high ability $\times$ business ownership is now greater in magnitude (-0.18) and closer to significance (p-value = 0.101), but interestingly the added interaction of this term with business ownership completely offsets that coefficient (0.20-0.18=0.02). In other words, we are finding that high ability individuals do (probably) experience more relative mobility, but only *outside* of business ownership. This is not to say that they don't do better on average as business owners(the Bus $\times$ high IQ interaction is positive, albeit very noisily estimated), but those from poorer families are not able to move up faster. In fact, remembering that "pctile parent wealth" is demeaned, we can calculate that for the bottom 4 deciles of wealth an individual with above-average IQ would do better in wage employment than

in business ownership – holding all else equal. This suggests that personal ability and financial resources are complements in entrepreneurship, which in turn is consistent with the presence of credit constraints.

There is yet another angle worth considering as we interpret these results: note that the "high IQ" coefficient refers to the middle of the wealth distribution, and that it is likely to be overwhelmed by the pctile parent wealth $\times$ high IQ interaction above the 80th percentile (since 5.74/.18 $\approx$ 32). At the 100th percentile, the "premium" associated with high IQ outside of business ownership would be negative $5.74 + 50 * (-0.18) = -3.3$. In other words, not only do smart young people need startup financial resources to succeed in business, but those with high initial resources need to run a business in order to maintain their status. Finally, in column 6 we include all interactions. None of our main conclusions change; there is stronger suggestive evidence that high-school dropouts experience more upward mobility through business ownership, but just as with IQ, they do not have more *relative* mobility as business owners.

Reviewing our results from table 18, we draw the following conclusions: 1) Within wage employment, high ability is well rewarded at low levels of initial wealth, and much less so (possibly not at all) with wealthy parents. In business ownership, on the other hand, high ability yields the same boost regardless of initial starting point. 2) If we consider different employment choices for otherwise comparable individuals, we find that for those of low ability business ownership implies a small boost that does not vary noticeably with initial wealth (i.e. it confers no increased mobility). For high ability individuals who start at the bottom of the wealth distribution, entrepreneurship and wage employment yield comparable outcomes. For those with high ability and high initial wealth, business ownership is much more lucrative, implying a complementarity between ability and family resources.

9.3 What are the combined implications for aggregate mobility?

One way to assess the combined effect of entrepreneurship of relative mobility is to simulate its absence. It is important to note here that we are not accounting for the positive externalities business owners create – through providing jobs, innovation spillovers, etc. Thus the simple simulation we perform *should NOT* be interpreted as presenting counterfactual aggregate outcomes. We are simply asking about implications for *relative* mobility, in a restricted, non-general equilibrium sense.

In this exercise, we ran the main wealth outcome specification, then recorded the residuals and predicted

outcome wealth rank after setting all business ownership and self-employment variables to zero (the ones referring to the current generation, not the parents). We add the residuals to the predicted values, then re-compute centiles of the result and interpret this as the outcome rank absent any entrepreneurial activity.

The new rank-rank intergenerational elasticity of wealth we find is 0.372 ± 0.026, which indicates indeed more mobility when compared to the 0.387 ± 0.026 elasticity we found for the actual outcome.[49] However, it is worth noting that in this counterfactual, while there is less stickiness at the top, there is on the other hand also more stickiness at the bottom.

10 Conclusion

In this paper we ask what role entrepreneurship has played in household wealth accumulation and intergenerational wealth mobility in the US. The data shows entrepreneurs, especially incorporated business owners, have accumulated considerably more wealth than wage workers. Regardless of where on the wealth distribution one came from, success at entrepreneurship corresponds to sizable advantages in wealth accumulation. However, access to entrepreneurship is far from uniform. Children from wealthy households whose parents themselves are entrepreneurs are far more likely to avail of this occupation - eclipsing the roles of education and even ability. As such, entrepreneurship has not played a large role in facilitating social mobility in the US. The data however, suggests that entrepreneurship shares similar weight to both education and occupational status in explaining total variation in outcomes.

The findings suggest the presence of informational and financial frictions in access to entrepreneurship. This is not dissimilar to other high status occupations such as banking and invention that also suffer from similar access barriers. Entrepreneurs however do make up the vast majority of America's wealthiest (top 1 percent) households. As such, it is especially important that we understand why there is so little churn in who can access this avenue for wealth building. Understanding to what extent financial versus social capital influences entrepreneurship will help with directing policy.

Ultimately, increasing participation in entrepreneurship will (arguably) have the dual benefit of reducing inequality and increasing economic growth. Giving the best and the brightest, regardless of origin, the opportunity to pursue and succeed in entrepreneurship will serve to increase the quality of firms, inventions

[49] If we don't include any (exogenous) controls, the elasticity still drops – this time from 0.425 ± 0.021 to 0.411 ± 0.021.

and ultimately, our standard of living.

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11 Figures

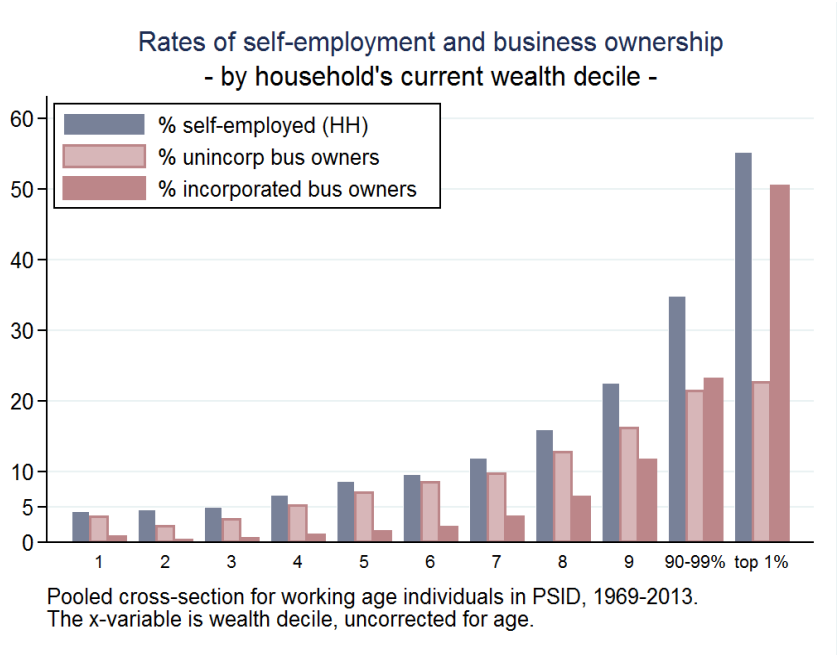


Figure 1: Cross-sectional snapshot of entrepreneurial activity by (current) wealth. (All tables and figures make use of only the representative PSID sample, unless noted otherwise.)



Figure 2: Youth self-employment and business ownership by outcome wealth

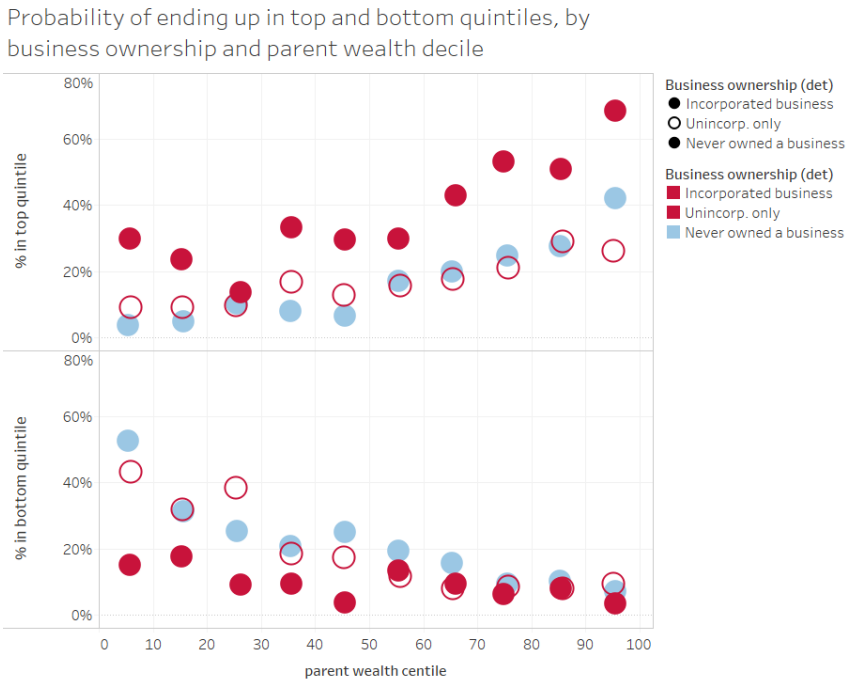


Figure 3: Placement in top/bottom wealth quintiles, by business ownership and parental wealth decile

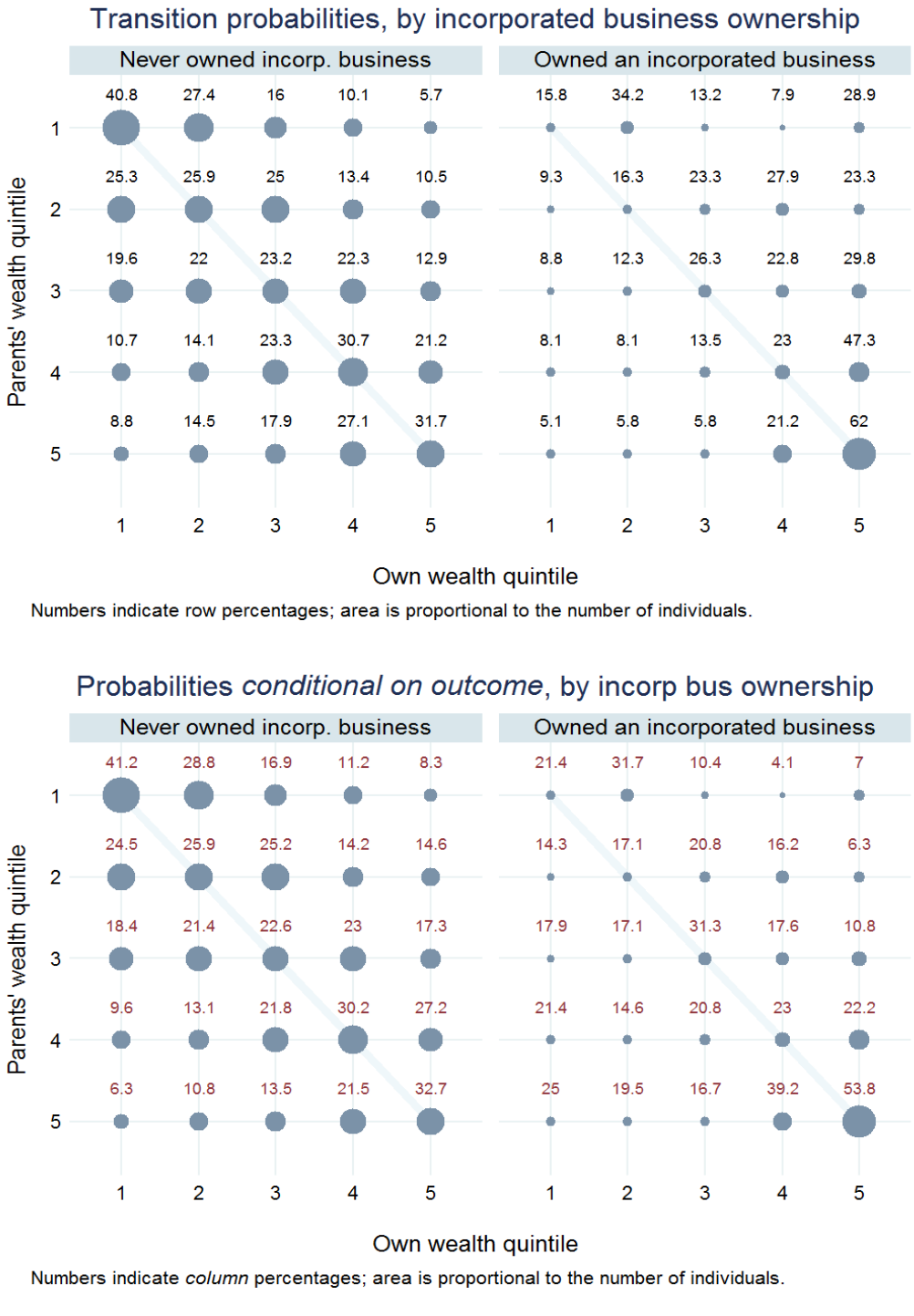


Figure 4: Prospective and retrospective transition probabilities

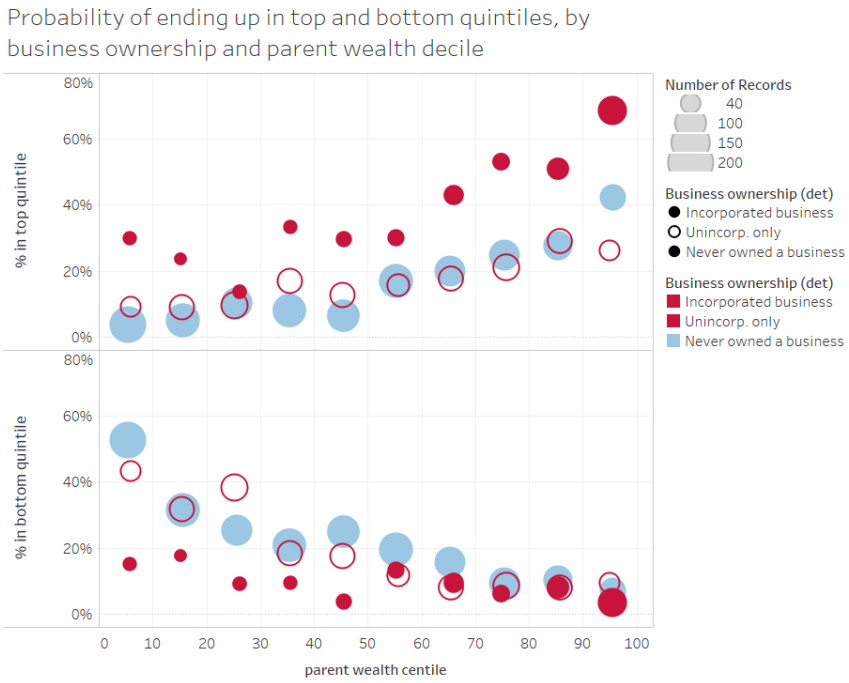


Figure 5: Placement in top/bottom wealth quintiles, by business ownership and parental wealth decile



Figure 6: Density of business owners in the joint wealth distribution

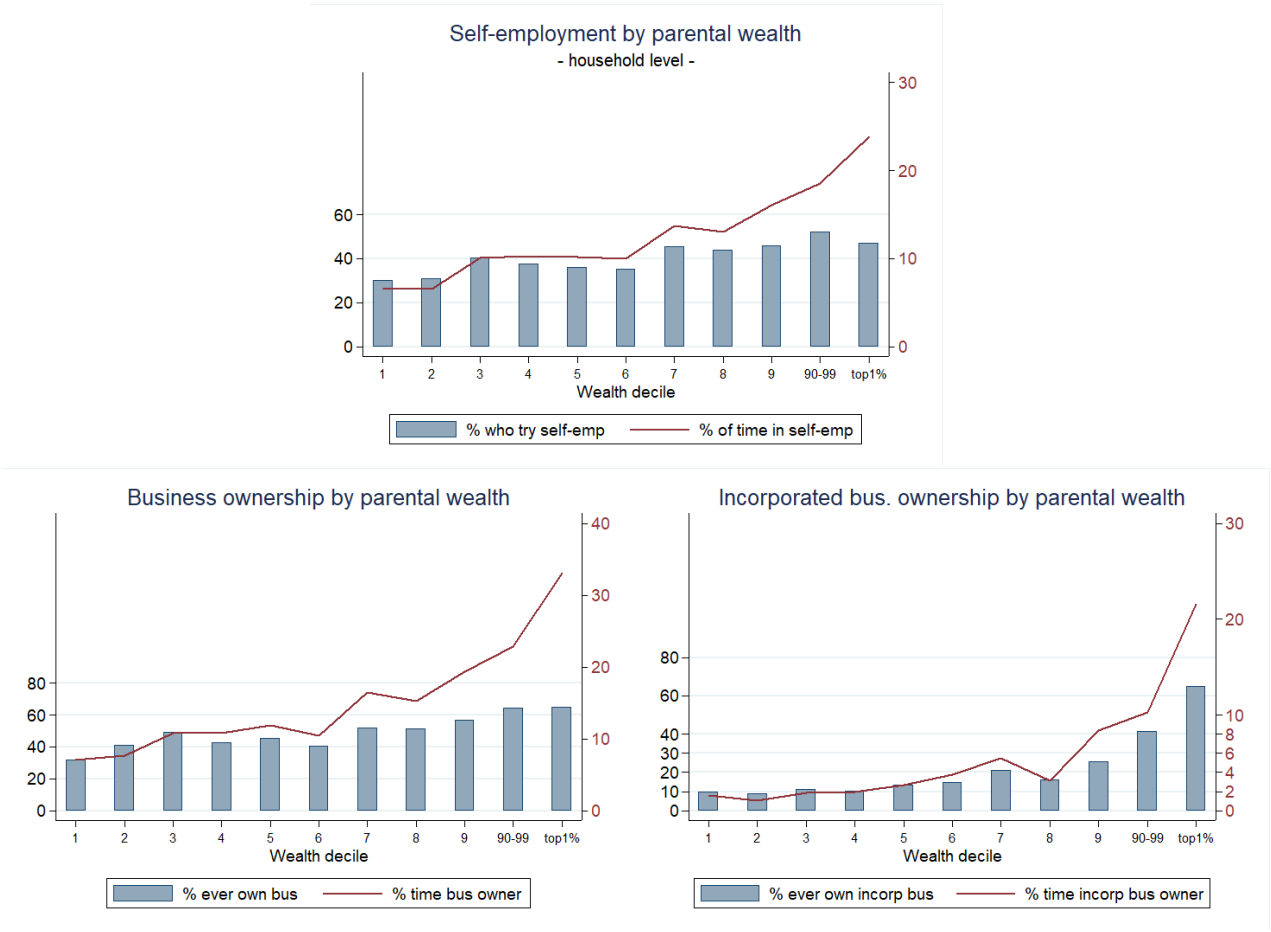


Figure 7: Entrepreneurial activity by *parental* wealth (as measured during mother's middle-age

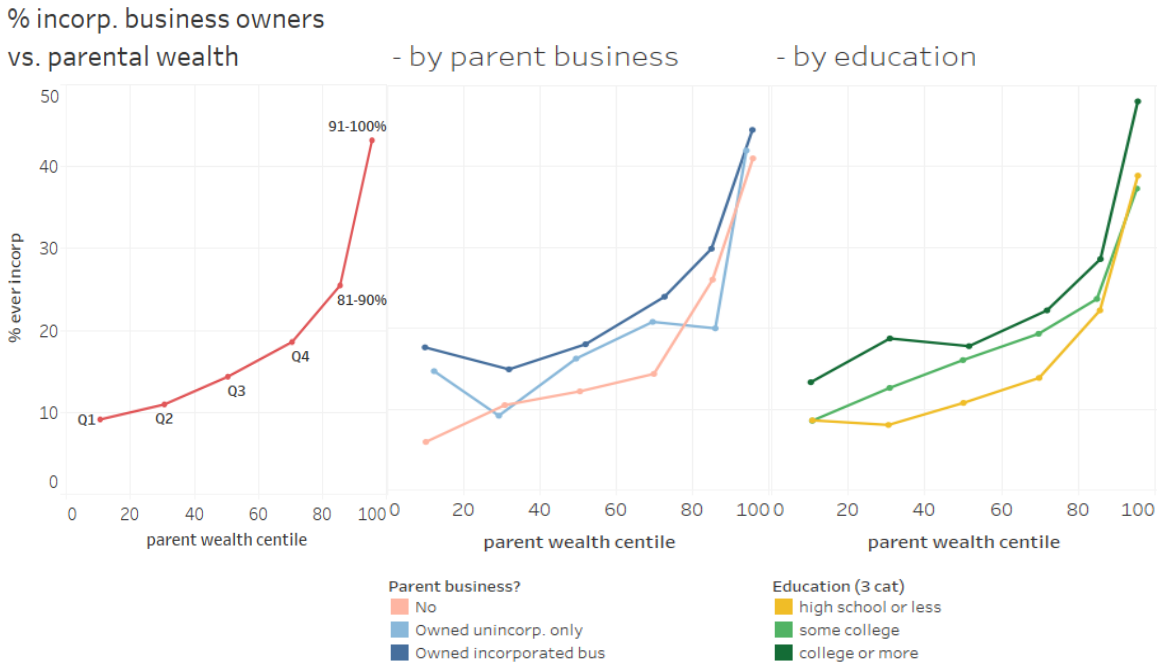


Figure 8: Entrepreneurship in relation to parental wealth: the positive association exists even if we account for parental business or education



Figure 9: Incorporated business ownership

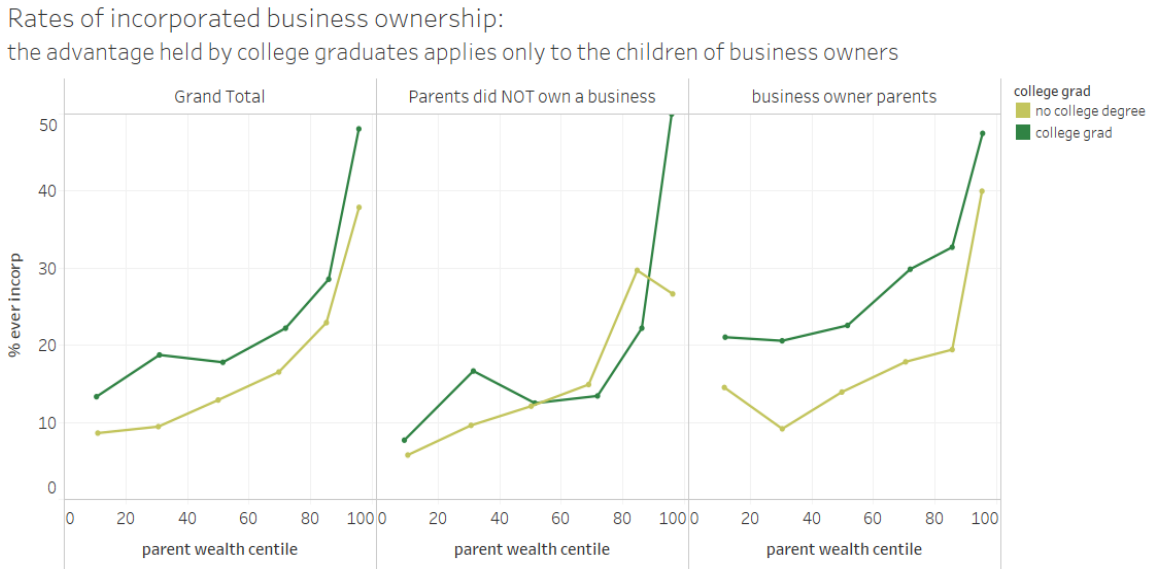


Figure 10: Incorporated business ownership

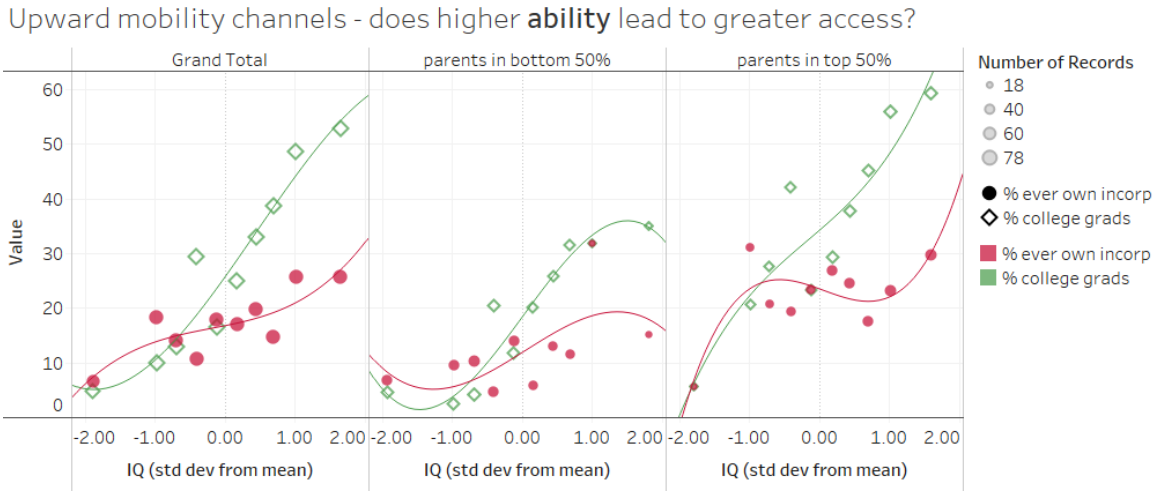


Figure 11: Education and business ownership: parental wealth is an advantage in both; however – unlike with college graduation – ability confers little additional advantage in becoming an incorporated business owner

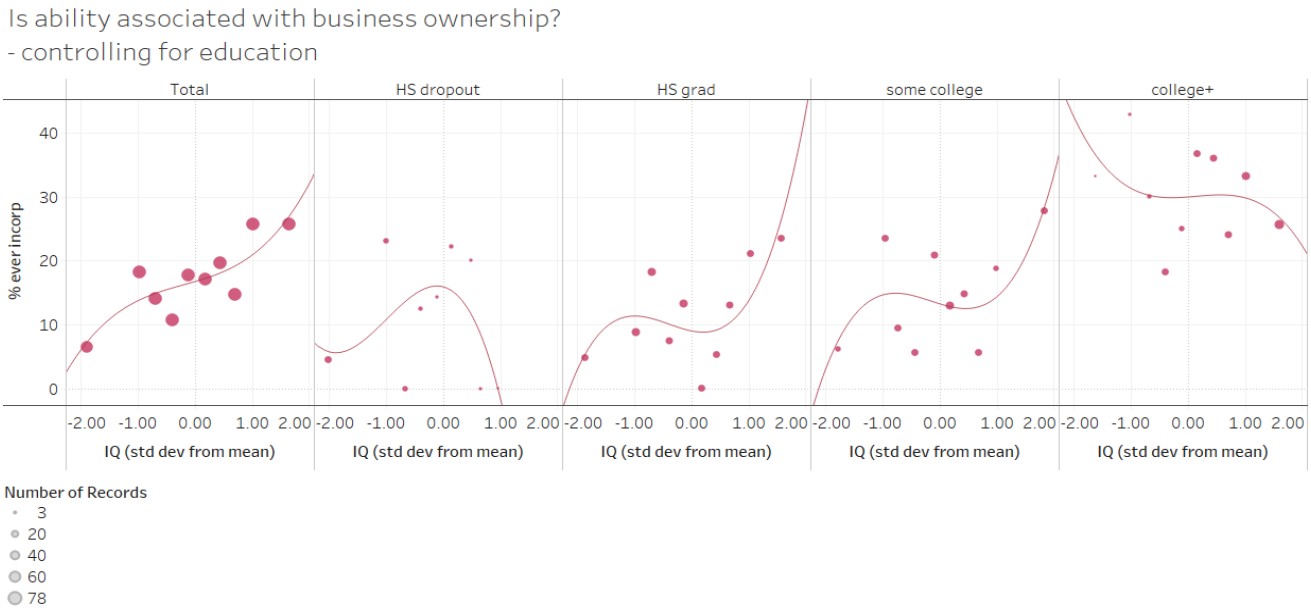


Figure 12: Business ownership: once we account for education, ability confers *no* additional advantage in becoming an incorporated business owner

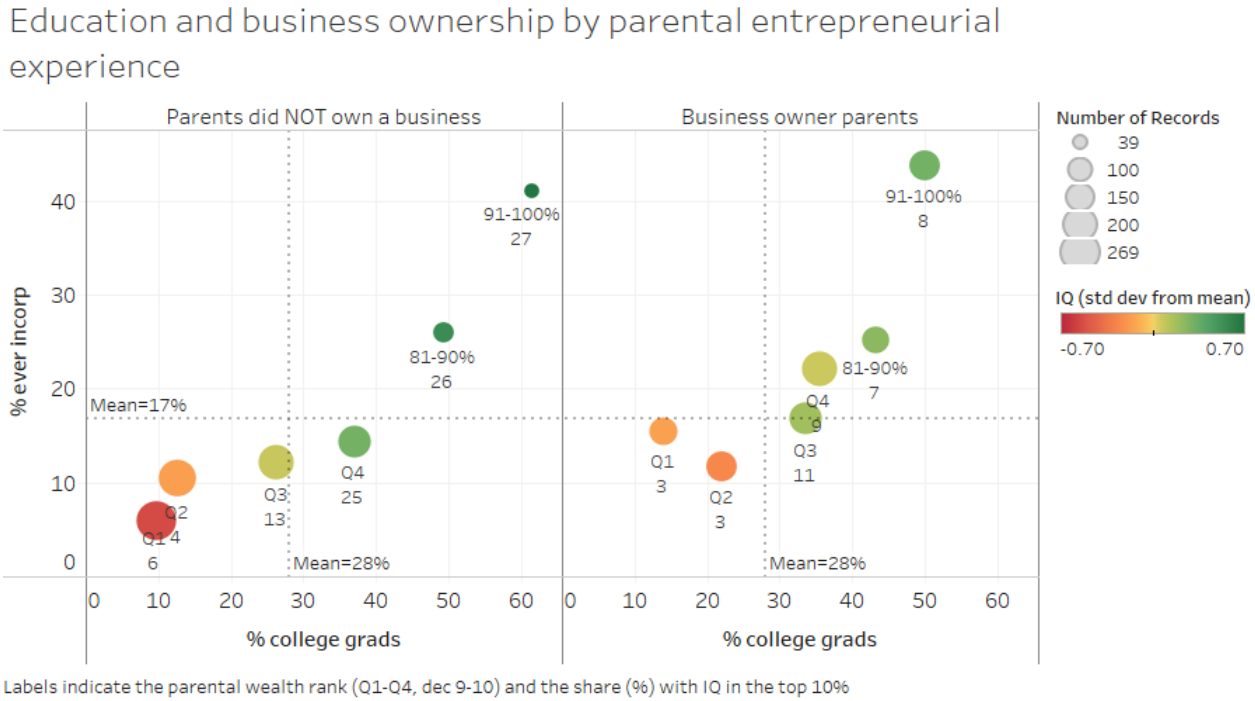


Figure 13: Comparing education achievement and bus. ownership, grouped by parental wealth quintile/decile

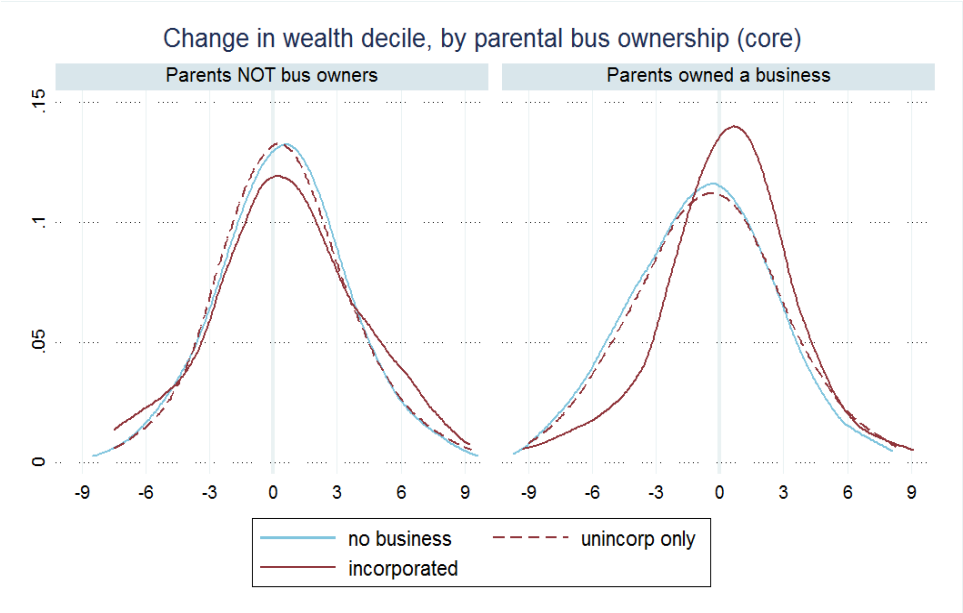


Figure 14: Wealth mobility by parental business ownership

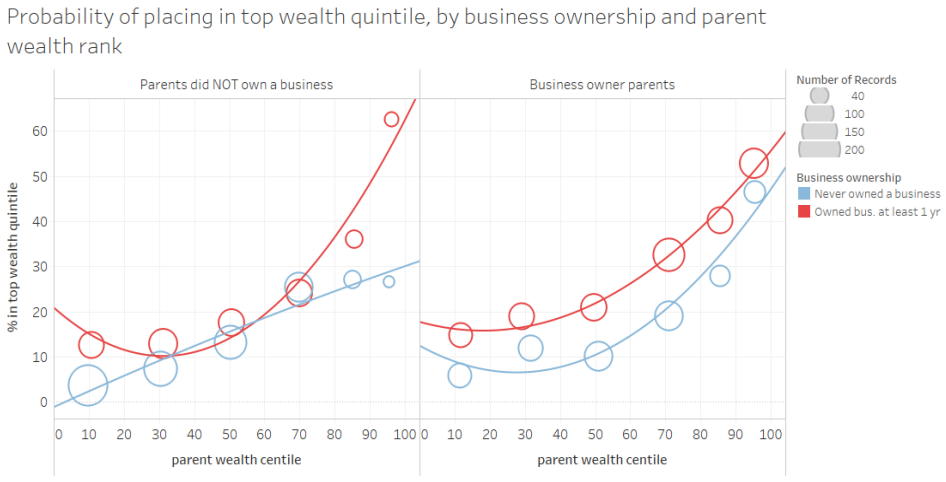


Figure 15: Placement in top wealth quintile, by family background and wealth rank

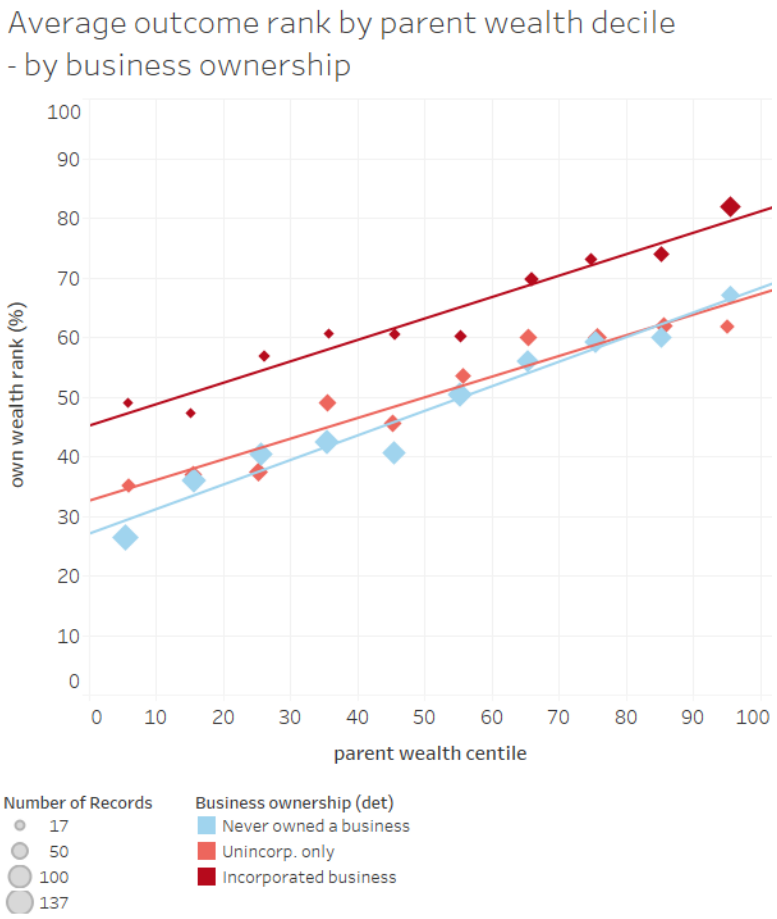


Figure 16: Relative mobility: incorporated business ownership and college completion

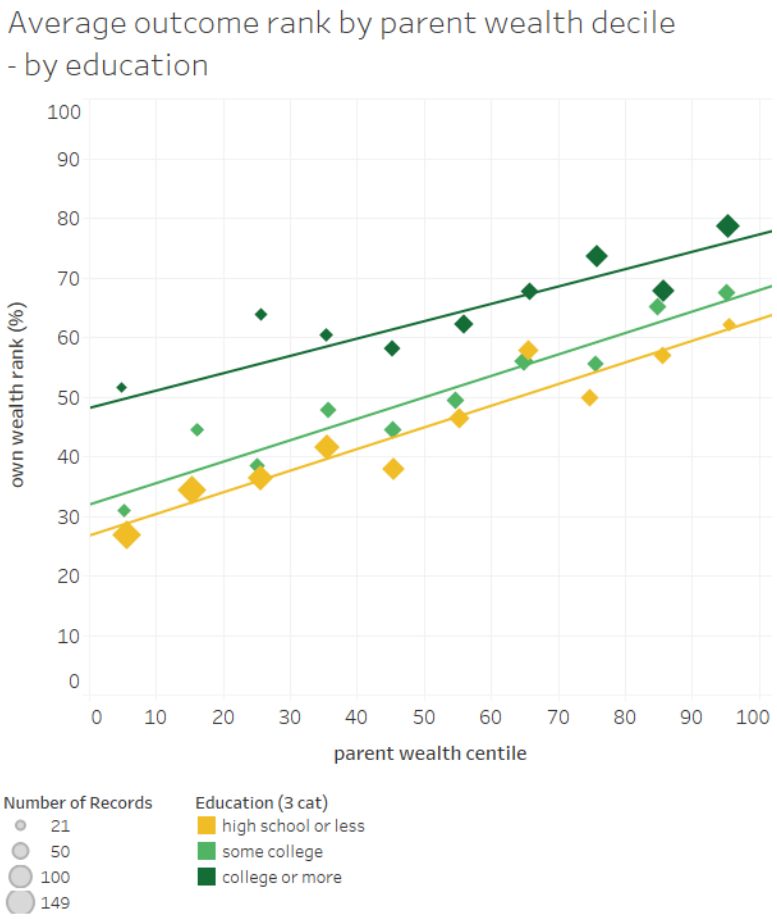


Figure 17: Relative mobility: incorporated business ownership and college completion

12 Tables

Table 1: Entrepreneurial pursuits by realized wealth ranking

outcome wealth rank	N	% ever self-emp (HH)	% yrs self-emp (HH)	% ever own bus	% yrs own bus	% ever own incorp	% yrs own incorp	% HS grads	% college grads	% Black	% other minority	Parent wealth decile
1	194	31	8	37	7	7	1.1	75	16	18.0	2.6	3.8
2	194	32	6	38	7	8	1.9	72	10	18.6	3.1	4.0
3	199	39	8	37	7	9	1.7	82	10	15.1	0.5	4.4
4	191	39	9	43	11	12	2.1	80	20	9.4	1.0	4.8
5	191	39	10	43	9	11	2.0	92	20	8.9	1.6	5.2
6	206	35	10	49	11	13	2.5	93	26	5.3	1.5	5.5
7	199	39	10	53	13	18	3.2	94	29	4.5	0.5	6.2
8	204	40	13	49	17	19	3.8	99	37	2.5	1.0	6.6
9	203	47	15	58	18	28	5.8	99	52	2.0	1.5	6.7
90-99th	181	56	26	64	30	45	14.8	97	61	1.1	4.4	7.6
top 1%	21	57	30	90	42	81	28.3	100	81	0.0	4.8	8.4
Total	1,983	40	12	47	13	17	4.1	88	28	8.4	1.8	5.5

Table 2: Inter-generational transition probabilities for all individuals, in percentage points

	own wealth outcome					
parent wealth quintile (rows)	Q1	Q2	Q3	Q4	Q5	Total
Q1	38.4	28.2	15.8	9.9	7.7	100
Q2	23.2	24.7	24.7	15.4	12.0	100
Q3	18.1	20.7	23.7	22.4	15.1	100
Q4	10.3	12.8	21.6	29.4	25.9	100
Q5	7.6	11.5	13.7	25.2	42.0	100
Total	20	20	20	20	20	100

Table 3: Inter-generational transition probabilities by self-employment attempt and duration (%)

	no-one in HH was self-emp					yrs self-emp < 20%					yrs self-emp >= 20%				
parent wealth quintile (rows)	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Q1	41	27	16	10	6	40	36	12	7	5	18	23	20	15	25
Q2	22	26	26	16	11	31	28	27	7	7	19	16	18	24	22
Q3	21	21	21	24	13	14	25	26	22	13	13	16	30	16	25
Q4	12	12	25	28	23	8	16	16	38	23	8	12	18	26	36
Q5	10	12	15	28	35	5	14	18	23	40	6	9	8	22	56
Total	22	20	21	21	17	20	24	20	19	18	11	14	18	21	36

Table 4: Inter-generational transition probabilities by business ownership (%)

parent wealth quintile (rows)	Never owned a business					Unincorp. only					Incorporated business				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Q1	43	28	15	10	4	36	27	19	9	9	16	35	14	8	27
Q2	22	30	25	14	9	29	20	25	13	13	10	17	24	29	21
Q3	22	23	21	23	12	15	21	28	22	14	9	12	26	23	30
Q4	13	13	26	26	22	8	15	20	38	19	8	8	14	23	47
Q5	9	15	16	26	34	9	14	21	29	27	5	5	6	21	62
Total	23	22	20	19	15	19	19	23	22	16	8	12	14	21	45

Table 5: Business ownership vs. self-employment – category overlap

ever self-emp (HH)	Time in self-emp (HH)	Grand Total		Never owned a business		Unincorp. only		Incorporated business	
		N	% in row	N	% in row	N	% in row	N	% in row
Grand Total		1,983	100%	1,043	53%	595	30%	345	17%
never self-emp	Total	1,194	100%	909	76%	197	16%	88	7%
	never self-emp	1,194	100%	909	76%	197	16%	88	7%
self-employed	Total	789	100%	134	17%	398	50%	257	33%
	yrs SE $<$ 20%	406	100%	117	29%	203	50%	86	21%
	yrs SE $>=$ 20%	383	100%	17	4%	195	51%	171	45%

Table 6: Explaining wealth outcomes, by entrepreneurial attempt

dep. var = wealth centile	OLS				Parent FE	
	(1)	(2)	(3)	(4)	(5)	(6)
Ever self-employed (HH)	2.65**	-0.19	0.23	-1.70	-1.33	-2.88
	(1.08)	(1.26)	(1.33)	(1.43)	(1.93)	(2.04)
yrs self-emp $\geq 20\%$				4.30**		4.55*
				(1.76)		(2.71)
Ever owned a business		4.96***	4.64***	0.99	3.87*	0.99
		(1.26)	(1.36)	(1.42)	(2.03)	(2.17)
Owned incorporated bus.				9.37***		6.78**
				(1.80)		(2.84)
share yrs: unempl (HH)	-37.21***	-37.10***	-35.62***	-33.12***	-30.31***	-29.35***
	(4.99)	(4.92)	(5.53)	(5.42)	(8.69)	(8.57)
share yrs: out lab force (HH)	-9.03***	-9.00***	-9.59***	-9.24***	-8.29**	-8.30**
	(2.20)	(2.18)	(2.39)	(2.36)	(3.58)	(3.57)
educ = HS dropout	-7.18***	-6.97***	-6.85***	-6.89***	-9.32***	-9.43***
	(1.67)	(1.67)	(1.86)	(1.88)	(3.04)	(3.07)
educ = some college	2.62*	2.77*	-0.37	-0.69	0.73	0.41
	(1.53)	(1.53)	(1.68)	(1.68)	(2.67)	(2.67)
educ = college grad	12.47***	12.41***	8.51***	8.10***	6.06*	5.92*
	(1.71)	(1.70)	(1.85)	(1.83)	(3.13)	(3.08)
educ = grad school	13.09***	13.03***	9.24***	8.90***	7.27*	6.74*
	(2.31)	(2.31)	(2.42)	(2.37)	(3.86)	(3.74)
share yrs (40-55): married	19.77***	19.67***	20.35***	20.24***	21.60***	21.64***
	(1.44)	(1.45)	(1.53)	(1.50)	(2.52)	(2.48)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Mid-age state FE	Yes	Yes	Yes	Yes	Yes	Yes
Age + age sq	Yes	Yes	Yes	Yes	Yes	Yes
Birth year+gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Parents' educ+state+immig+race	Yes	Yes	Yes	Yes	-	-
Parents' wealth cent FE	-	-	Yes	Yes	-	-
Parent empl+bus+industry	-	-	Yes	Yes	-	-
Mother's marital status	-	-	Yes	Yes	-	-
Parent FE	-	-	-	-	Yes	Yes
Num observations	2198	2198	1914	1914	1595	1595
Num clusters	1033	1033	899	899	577	577
R^2	0.402	0.407	0.479	0.491	0.718	0.722
Adj R^2	0.358	0.362	0.393	0.407	0.502	0.509

Notes: Each observation represents an individual in the PSID sample, with wealth taken as the median percentile over the individual's appearances in PSID while between 40 and 55 years old. Only individuals born between 1950 and 1973 and whom we can observe during at least 5 years between 18 and 40 are included. Parents' wealth is computed as the wealth rank of the mother's household during middle age (40-55), supplemented with the data from the mother's late-middle age (56-65) when needed. The last 2 columns introduce fixed effects at the level of the parent (specifically, the main working parent). In all columns the dependent variable is outcome wealth percentile.

* "Parent's" employment (including self-employment), business ownership, industry, and fixed effects (cols 3 and 4) refers to the main earner in the family unit (usually the father, unless a father is not present or the mother works more years). Education is usually available for both parents and therefore reported for both. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 7: OLS analysis of outcome wealth centile – breakdown of explanatory power

	benchmk	exog		+ own choices				
dep var = wealth centile	(1)	(2)	(3)	(4)	+educ (5)	+empl. (6)	+SE/bus (7)	+all (8)
Self-emp/ bus ownership							Yes	Yes
unemp/ out labor force						Yes		Yes
Education					Yes			Yes
State+industry+marital				Yes	Yes	Yes	Yes	Yes
Parent educ+bus+indus+...	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Parent wealth+immig+race	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age+gender+birthplace	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num observations	1914	1914	1914	1914	1914	1914	1914	1914
Num clusters	899	899	899	899	899	899	899	899
R^2	0.0925	0.291	0.317	**0.430**	0.454 **(+.024)**	0.456 **(+.026)**	0.452 **(+.022)**	0.491
Adj R^2	0.0575	0.220	0.239	0.340	0.366	0.370	0.364	0.407

Notes: The sample is restricted to be the same across specification for easier comparison. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 8: Characteristics and entrepreneurial pursuits by *parental* wealth ranking

parents wealth rank	N	% ever self-emp (HH)	% yrs self-emp (HH)	% ever own bus	% yrs own bus	% ever own incorp	% yrs own incorp	% HS grads	% college grads	% Black	% other minority	Mean wealth decile
1	198	31	7	32	7	10	1.6	66	12	31.3	4.5	3.6
2	204	31	7	41	8	8	1.0	78	10	21.1	0.5	4.2
3	193	40	10	49	11	11	1.9	84	16	8.8	1.0	4.6
4	200	38	10	43	11	10	1.9	88	17	10.5	2.0	5.1
5	198	36	10	45	12	14	2.6	92	25	5.1	1.5	5.0
6	198	35	10	40	10	15	3.5	94	34	4.5	2.5	5.7
7	197	45	13	52	16	21	5.3	93	28	0.5	2.0	6.4
8	199	44	13	51	15	16	3.1	96	44	1.5	0.5	6.6
9	200	46	16	57	19	26	8.3	95	46	0.0	1.5	6.8
90-99th	179	53	19	64	23	42	10.4	98	51	0.6	1.7	7.5
top 1%	17	47	24	65	33	65	21.6	100	71	0.0	0.0	9.2
Total	1,983	40	12	47	13	17	4.1	88	28	8.4	1.8	5.6

Table 9: *Parent* characteristics and entrepreneurship by parental wealth ranking

parent wealth rank	N	% parents self-empl	% parents owned a business	% parents with incorp. bus	IQ (std deviations from mean)	% fathers college grads	% mothers college grads
1	198	22%	26%	10%	-0.49	6%	5%
2	204	12%	29%	5%	-0.29	9%	2%
3	193	24%	35%	14%	-0.03	8%	1%
4	200	18%	31%	19%	-0.37	13%	7%
5	198	17%	44%	11%	0.09	21%	13%
6	198	20%	44%	17%	0.18	17%	6%
7	197	23%	51%	15%	0.11	23%	14%
8	199	30%	51%	28%	0.22	29%	10%
9	200	36%	60%	32%	0.38	39%	23%
90-99%	179	56%	78%	51%	0.37	53%	28%
Top 1%	17	76%	76%	76%	0.67	65%	59%
Grand To..	1,983	26%	45%	20%	0.03	22%	11%

Table 10: Summary statistics by parental wealth and parental business ownership

parent business	parent wealth ranking	N	% ever own bus	% ever own incorp	% college grads	% spouse college grad	% both college grads	IQ (std dev from mean)	% IQ above median	% IQ in top10%	% IQ in bottom 10%	% moved states	Mean wealth decile
Parents did NOT own a business	Q1	265	30	6	10	13	5	-0.55	24	6	22	18	3.8
	Q2	236	42	10	13	21	5	-0.17	41	4	11	22	4.7
	Q3	210	40	11	27	30	17	0.08	49	13	5	21	5.6
	Q4	180	46	14	37	44	29	0.32	62	25	7	37	6.6
	81-90%	73	49	26	49	44	34	0.56	76	26	6	34	6.5
	91-100%	37	62	43	65	52	48	0.73	87	27	0	51	7.8
	Total	1,001	40	12	24	29	17	-0.01	47	13	10	26	5.2
Business owner parents	Q1	136	50	15	14	24	10	-0.16	41	3	10	42	3.9
	Q2	153	51	11	22	26	17	-0.26	41	3	15	31	5.1
	Q3	183	47	17	34	31	20	0.18	62	11	6	30	5.1
	Q4	213	56	22	35	45	26	0.08	53	9	6	30	6.4
	81-90%	126	60	25	43	52	31	0.25	67	7	4	31	7.0
	91-100%	157	65	45	50	52	37	0.32	63	8	3	27	7.6
	Total	968	55	23	33	39	24	0.07	54	7	7	31	5.9

Table 11: Entrepreneurship as a function of education

Educ level	N	% ever self-emp (HH)	% yrs self-emp (HH)	% ever own bus	% yrs own bus	% ever own incorp	% yrs own incorp	IQ (std dev from mean)
HS dropout	229	38	7	39	7	8	1.3	-0.70
HS grad	684	37	10	45	11	13	2.6	-0.14
some college	507	43	15	48	16	18	4.8	0.04
college	368	39	11	52	15	26	5.7	0.54
post-grad	195	45	16	55	17	27	7.4	0.50
Total	1,983	40	12	47	13	17	4.1	0.03

Table 12: Determinants of business ownership and self-employment

dep var = was anyone in HH:	a business owner			incorporated bus. owner		
	(1)	(2)	(3)	(4)	(5)	(6)
parent bus owner		0.077***			0.047**	
		(0.027)			(0.022)	
parent bus × no college deg			0.071**			0.017
			(0.032)			(0.024)
parent bus × college+			0.089**			0.118***
			(0.044)			(0.035)
educ = HS dropout	-0.033	-0.029	-0.028	-0.015	-0.018	-0.016
	(0.038)	(0.040)	(0.040)	(0.027)	(0.027)	(0.027)
educ = some college	-0.020	-0.017	-0.017	0.009	0.009	0.013
	(0.032)	(0.032)	(0.032)	(0.023)	(0.023)	(0.023)
educ = college grad	0.018	0.024	0.015	0.055*	0.056**	0.007
	(0.037)	(0.038)	(0.047)	(0.028)	(0.028)	(0.032)
educ = grad school	0.037	0.031	0.022	0.034	0.035	-0.017
	(0.048)	(0.049)	(0.057)	(0.035)	(0.035)	(0.039)
parent wealth dec = 2-7	Yes	Yes	Yes	Yes	Yes	Yes
parent wealth dec = 8, 8	0.069	0.031	0.031	-0.022	-0.028	-0.029
	(0.055)	(0.058)	(0.058)	(0.037)	(0.038)	(0.038)
parent wealth dec = 9, 9	0.067	0.019	0.019	0.045	0.036	0.036
	(0.057)	(0.059)	(0.059)	(0.045)	(0.046)	(0.045)
parent wealth dec = 10, 90-99%	0.133**	0.057	0.057	0.193***	0.175***	0.174***
	(0.060)	(0.065)	(0.064)	(0.049)	(0.050)	(0.049)
parent wealth dec = 11, Top 1%	0.133	0.059	0.059	0.343***	0.334***	0.330***
	(0.085)	(0.087)	(0.087)	(0.070)	(0.072)	(0.073)
Own+parents' education	Yes	Yes	Yes	Yes	Yes	Yes
Own+parent's industry	Yes	Yes	Yes	Yes	Yes	Yes
Childhood state	Yes	Yes	Yes	Yes	Yes	Yes
Birth year+gender+marital	Yes	Yes	Yes	Yes	Yes	Yes
Num observations	1979	1930	1930	1933	1930	1930
Num clusters	921	905	905	906	905	905
R^2	0.128	0.134	0.134	0.162	0.165	0.168
Adj R^2	0.0775	0.0760	0.0755	0.106	0.108	0.111

Notes: The dependent variables are indicators for whether the household owned a business (cols 1 and 2), owned an incorporated business (col 3), had a self-employed member (cols 4 and 5), and had a self-employed member at least 20% of the time. Indicators are multiplied at 100.

[a] The first independent variable is an indicator for whether the primary working parent owned a business (cols 1-3) or was self-employed (cols 5-6). Similarly, "same industry" compares the mode industry of the main earning parent with the mode industry over the individual. Standard errors are robust and clustered at the level of the original (1968) household. Significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 13: Determinants of business ownership and self-employment, including a measure of ability

dep var = was anyone in HH:	incorp. bus owner			SE $\geq$ 20%	
	(1)	(2)	(3)	(4)	(5))
IQ (standardized)	0.030**	0.012	0.015	0.020	0.017
	(0.015)	(0.016)	(0.016)	(0.016)	(0.017)
Own + parents' education	-	Yes	Yes	-	Yes
Parent[a] business owner/self-emp			Yes		Yes
Parent wealth decile, top 1%			Yes		Yes
Own industry	Yes	Yes	Yes	Yes	Yes
Childhood state	Yes	Yes	Yes	Yes	Yes
Birth year+gender+marital	Yes	Yes	Yes	Yes	Yes
Immig background+race	Yes	Yes	Yes	Yes	Yes
Num observations	811	807	729	811	726
Num clusters	562	560	498	562	498
R^2	0.141	0.175	0.230	0.170	0.216
Adj R^2	0.0415	0.0635	0.0974	0.0739	0.0798

Notes: The dependent variables are indicators for whether the household owned a business (col 1), owned an incorporated business (cols 2-3), had a self-employed member (col 4), and had a self-employed member at least 20% of the time (cols 5-6). Indicators are multiplied at 100.
IQ is based on the problem solving score of the households' children, scaled to a standard normal distribution.
[a] The first independent variable is an indicator for whether the main earning parent owned a business (cols 1-3) or was self-employed (cols 5-6). Standard errors are robust and clustered at the level of the original (1968) household. Significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 14: Explaining wealth outcomes – the importance of parental entrepreneurship

	dep var = parent wealth cent.			log(wealth)
entrep=business owner	(1)	(2)	(3)	(4)
entrep	4.84***			
	(1.20)			
entrep × no college deg		4.88***	0.97	0.05
		(1.39)	(1.81)	(0.10)
entrep × college+		4.61**	5.56*	0.31**
		(2.17)	(3.11)	(0.16)
parent *entrep*	-2.80**			
	(1.33)			
parent *entrep* × no college deg		-3.63**	-7.93***	-0.33***
		(1.49)	(1.81)	(0.12)
parent *entrep* × college+		-0.89	0.03	-0.02
		(2.30)	(3.35)	(0.18)
entrep × parent *entrep*				
entrep × parent *entrep* × no college deg			8.89***	0.59***
			(2.71)	(0.16)
entrep × parent *entrep* × college+			-1.91	0.05
			(4.33)	(0.23)
educ = HS dropout (vs HS grad)	-6.75***	-6.72***	-6.80***	-0.43***
	(1.86)	(1.86)	(1.84)	(0.14)
educ = some college	-0.30	-0.22	-0.33	0.08
	(1.67)	(1.67)	(1.67)	(0.10)
educ = college grad	8.47***	7.25***	5.33*	0.37**
	(1.84)	(2.58)	(2.85)	(0.16)
educ = grad school	9.21***	7.95***	6.02**	0.49***
	(2.41)	(2.85)	(2.98)	(0.17)
Yrs unempl+out of labor force	Yes	Yes	Yes	Yes
Industry+state FE	Yes	Yes	Yes	Yes
Age+age sq+married	Yes	Yes	Yes	Yes
Birth year+gender FE	Yes	Yes	Yes	Yes
Parents' educ+state+immig+race	Yes	Yes	Yes	Yes
Parent empl+bus+industry	Yes	Yes	Yes	Yes
Mother's marital status	Yes	Yes	Yes	Yes
Parents' wealth cent FE	Yes	Yes	Yes	
log parent wealth + sq				Yes
Num observations	1920	1920	1920	*1812*
Num clusters	903	903	903	868
R^2	0.478	0.478	0.482	0.492
Adj R^2	0.394	0.393	0.397	0.438

Notes: OLS regressions introducing interactions between own and parental experience in business ownership. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 15: Explaining wealth outcomes – the importance of ability in entrepreneurship

	dep var = parent wealth cent.			log(wealth)	
entrep=business owner	(1)	(2)	(3)	(4)	(5)
IQ (standardized)	2.70***	2.26		0.15*	
	(1.02)	(1.47)		(0.09)	
IQ × no college			1.04		0.11
			(1.62)		(0.09)
IQ × college+			7.82*		0.36
			(4.22)		(0.23)
entrep	5.19***	5.15***		0.31***	
	(1.94)	(1.94)		(0.12)	
entrep × no college deg			5.67**		0.32**
			(2.22)		(0.13)
entrep × college+			9.22*		0.49*
			(4.82)		(0.27)
entrep × IQ		0.82		0.05	
		(1.81)		(0.11)	
entrep × IQ × no college			2.87		0.13
			(2.16)		(0.13)
entrep × IQ × college+			-6.64		-0.25
			(4.53)		(0.26)
parent *entrep*	-2.07	-2.03	-2.02	-0.10	-0.10
	(2.17)	(2.17)	(2.17)	(0.13)	(0.13)
educ = HS dropout	-10.03***	-10.07***	-10.31***	-0.53**	-0.54**
	(3.25)	(3.26)	(3.25)	(0.23)	(0.23)
educ = some college	-1.80	-1.88	-1.95	-0.00	-0.01
	(2.79)	(2.79)	(2.79)	(0.17)	(0.17)
educ = college grad	9.44***	9.40***	6.95	0.41**	0.31
	(3.36)	(3.36)	(4.68)	(0.20)	(0.27)
educ = grad school	10.20***	10.21***	6.97	0.54**	0.40
	(3.78)	(3.79)	(5.39)	(0.21)	(0.30)
Yrs unempl+olf	Yes	Yes	Yes	Yes	Yes
Educ+industry	Yes	Yes	Yes	Yes	Yes
Mid-age state FE	Yes	Yes	Yes	Yes	Yes
Age+age sq+married	Yes	Yes	Yes	Yes	Yes
Birth year+gender FE	Yes	Yes	Yes	Yes	Yes
Parents' educ+state+immig+race	Yes	Yes	Yes	Yes	Yes
Parent empl+bus+industry	Yes	Yes	Yes	Yes	Yes
Mother's marital status	Yes	Yes	Yes	Yes	Yes
Parents' wealth cent FE	Yes	Yes	Yes		
Log parent wealth + sq				Yes	Yes
Num observations	716	716	716	688	688
Num clusters	492	492	492	481	481
R^2	0.649	0.649	0.652	0.678	0.679
Adj R^2	0.452	0.451	0.452	0.484	0.482

Notes: OLS regressions introducing interactions between own and parental experience in business ownership. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 16: Rank-based intergenerational elasticity of wealth, overall and for sub-samples

entrep=	–	bus owner	incorp	uninc only	self-emp
dep var=pctile wealth	(1)	(2)	(3)	(4)	(5)
pctile parent wealth-50	0.39***	0.37***	0.36***	0.42***	0.36***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
(pctile parent wealth$-50)^2$	0.00				
	(0.00)				
entrep		6.19***	13.48***	-1.81	3.53***
		(1.25)	(1.78)	(1.30)	(1.22)
(pctile par wealth-50)**entrep*		0.02	0.00	-0.10**	0.07
		(0.04)	(0.06)	(0.05)	(0.04)
Demographic vars	Yes	Yes	Yes	Yes	Yes
Num observations	1979	1979	1979	1979	1979
Num clusters	921	921	921	921	921
R^2	0.252	0.261	0.280	0.253	0.255
Adj R^2	0.221	0.231	0.250	0.222	0.225

Notes: We subtracted 50 from all instances of parental wealth percentile. $entrep$ stands in for the different entrepreneurial categories: whether anyone in the individual's household was ever a business owner (col 2), an incorporated business owner (col 3), or whether they only owned unincorporated business(es) (col 4), or whether either the individual or their spouse was ever self-employed (col 5). Interactions of the category indicators (*entrep*) and the square of log wealth were attempted but dropped due to a lack of statistical significance.

Table 17: Rank-based intergenerational elasticity of wealth – is there more relative mobility among entrepreneurs with entrepreneurial parents?

dep var=wealth pctile	(1)	(2)	(3)	(4)	(5)
pctile parent wealth-50	0.39***	0.40***	0.38***	0.35***	0.39***
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)
Ever owned a business	6.37***	3.45**			4.15**
	(1.25)	(1.63)			(1.74)
Parent owned a business	-1.57	-4.40**			-4.30**
	(1.43)	(1.84)			(2.08)
Owned a business * Parent owned bus		5.86**			4.30
		(2.57)			(2.64)
pctile parent wealth*Bus		-0.03			-0.07
		(0.06)			(0.06)
pctile parent wealth*Parent bus	-0.00	-0.03			-0.07
	(0.05)	(0.06)			(0.08)
pctile parent wealth*Bus*Parent bus		0.04			0.05
		(0.09)			(0.09)
Ever self-employed (HH)			3.57***	1.51	-1.69
			(1.25)	(1.42)	(1.54)
Parent was ever self-emp			0.00	-3.29	-1.23
			(1.59)	(2.00)	(2.22)
Ever self-emp*Parent self-emp				7.87***	5.96**
				(2.94)	(2.96)
pctile parent wealth*Ever self-emp				0.07	0.09
				(0.05)	(0.06)
pctile parent wealth*Parent self-emp			0.04	0.06	0.09
			(0.05)	(0.06)	(0.07)
pctile parent wealth*ever SE*Parent SE				-0.08	-0.10
				(0.09)	(0.09)
Exog. demographic vars	Yes	Yes	Yes	Yes	Yes
Num observations	1974	1974	1959	1959	1959
Num clusters	920	920	914	914	914
R^2	0.259	0.264	0.248	0.255	0.264
Adj R^2	0.228	0.232	0.216	0.222	0.229

Notes: We subtracted 50 from all instances of parental wealth percentile.

Table 18: Intergenerational elasticity of wealth – by business ownership, education, and ability

dep var=wealth pctile	(1)	(2)	(3)	(4)	(5)	(6)
pctile parent wealth-50	0.33***	0.30***	0.31***	0.25***	0.31***	0.32***
	(0.03)	(0.03)	(0.04)	(0.06)	(0.08)	(0.08)
Educ = HS dropout	-16.22***	-16.09***	-17.28***	-12.61***	-13.26***	-17.85***
	(2.11)	(2.08)	(2.63)	(3.63)	(3.69)	(4.13)
pctile parent wealth*HS dropout	-0.19***	-0.19***	-0.22***	-0.06	-0.08	-0.20
	(0.06)	(0.06)	(0.08)	(0.11)	(0.11)	(0.13)
Educ = college grad	12.69***	12.57***	12.98***	15.33***	15.38***	18.11***
	(1.55)	(1.53)	(2.06)	(2.38)	(2.38)	(3.36)
pctile parent wealth*college grad	-0.05	-0.06	-0.07	-0.07	-0.06	-0.10
	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)	(0.12)
Business owner		5.75***	5.69***	5.13***	3.27	3.16
		(1.20)	(1.57)	(1.84)	(2.79)	(3.11)
pctile parent wealth*Bus		0.03	0.02	0.08	-0.03	-0.04
		(0.04)	(0.06)	(0.06)	(0.09)	(0.11)
Bus * HS dropout			2.50			9.70
			(4.20)			(7.55)
pctile parent wealth*Bus*HS drop			0.04			0.23
			(0.13)			(0.23)
Bus * college			-0.96			-4.91
			(3.06)			(4.39)
pctile parent wealth*Bus*college+			0.04			0.07
			(0.10)			(0.15)
IQ above median				7.06***	5.74**	4.97*
				(1.95)	(2.78)	(2.86)
pctile parent wealth*high IQ				-0.07	-0.18	-0.19*
				(0.07)	(0.11)	(0.11)
pctile parent wealth*Bus*high IQ					0.20	0.20
					(0.13)	(0.14)
Bus * high IQ					2.18	3.38
					(3.79)	(3.93)
Exog. demographic vars	Yes	Yes	Yes	Yes	Yes	Yes
Num observations	1979	1979	1979	733	733	733
Num clusters	921	921	921	503	503	503
R^2	0.310	0.319	0.319	0.408	0.410	0.413
Adj R^2	0.280	0.290	0.288	0.334	0.335	0.334

Notes: We subtracted 50 from all instances of parental wealth percentile.

13 Appendix

13.1 Patterns in the characteristics and behavior of the children of business owners

Figure 18 suggests several things: first, not only are the children of business owners less diverse in terms of ability, but also in terms of education and geographic mobility. In particular, as figure 19 demonstrates, the children of business owners have relatively high odds of leaving the state, but these odds do not go up with ability. In fact, if the offspring will also become a business owner, the odds of getting a college degree are also not highly correlated with ability. Among non-business owners, on the other hand, high ability is highly correlated with formal education and geographic mobility, especially at the high end. Taken together, we might conclude that during the parents' generation the returns to ability were significantly lower in business ownership. However, another mechanism may also be at play: we posit that the highly skilled children of successful business owners were often groomed to take over the business, which made them less likely to go to college and to move away.

We show these patterns more explicitly in table 19: for the bottom 60% of the wealth distribution, the children of business owners are *more* likely to move out of state - this is consistent with having more resources, a stronger appetite for pursuing opportunities, etc. For the top wealth deciles, however, the pattern is reversed: children from business-owning families are more likely to stay close-by, foregoing college and the possibility of finding another well-educated mate, which in turn means that *their* children's scores are closer to the mean.

Nonetheless, both the movers and stayers among the offspring of business owners are more likely to be entrepreneurs themselves than their former classmates with wage-employed parents.

To begin with, figure 21 shows that average ability increases faster with the current generation's wealth than with their parents' generation wealth. This in itself may not be that meaningful, since we know there is less precision in our measurement of parental ability. Next, we separate the sample in each case by whether the corresponding generation in that family owned a business. Figure 20 shows a very strong association of ability with parental wealth *if* the parents did not own a business, even though figure 22 shows that in the current generation business owners have, if anything, a somewhat *higher* link between ability and wealth at the upper end of the distribution. In other words, the data suggests that high IQ is rewarded in business ownership in the current generation, but this was not as much the case in the parents' generation. Or, if our measure of ability is simply much noisier for the parents, the link between ability and

wealth for wage employees was stronger in the earlier generation. Whichever is the case, we can conclude that success in business ownership is becoming more meritocratic relative to wage employment.



Figure 18: Education, geographic mobility

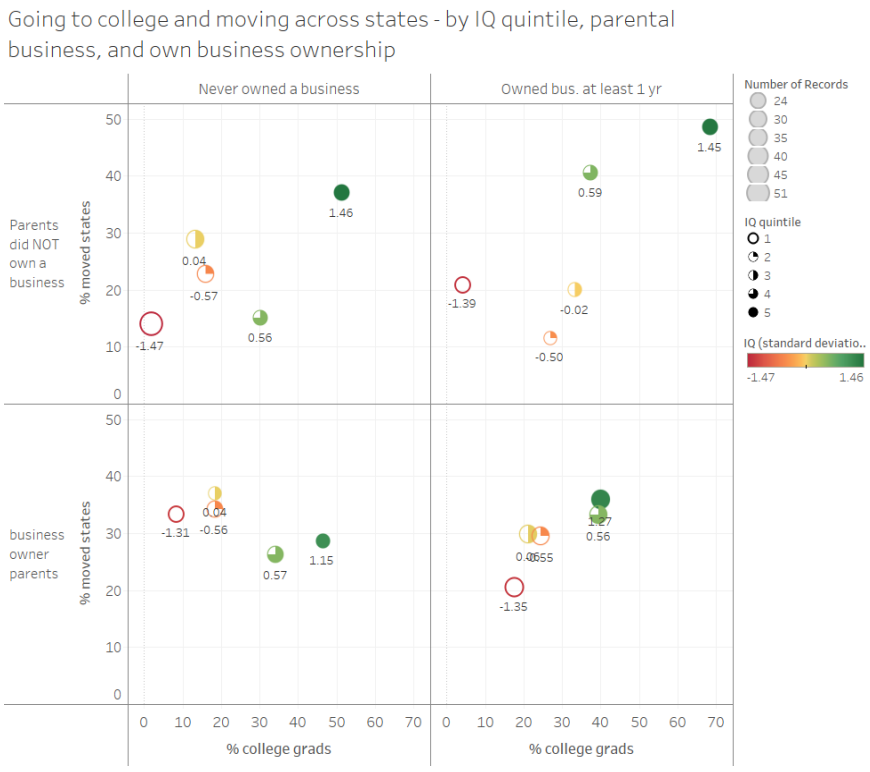


Figure 19: Education and geographic mobility

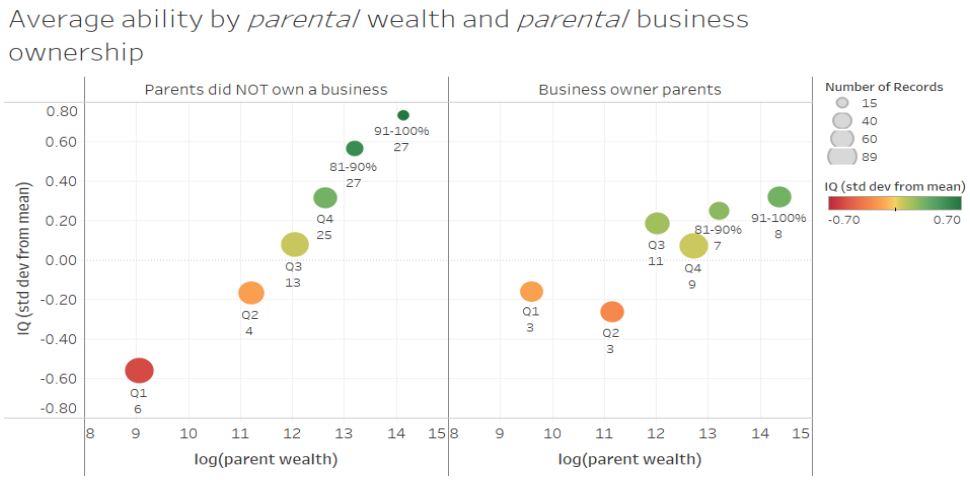


Figure 20: Correlation of parental wealth and IQ - separating business owning parents

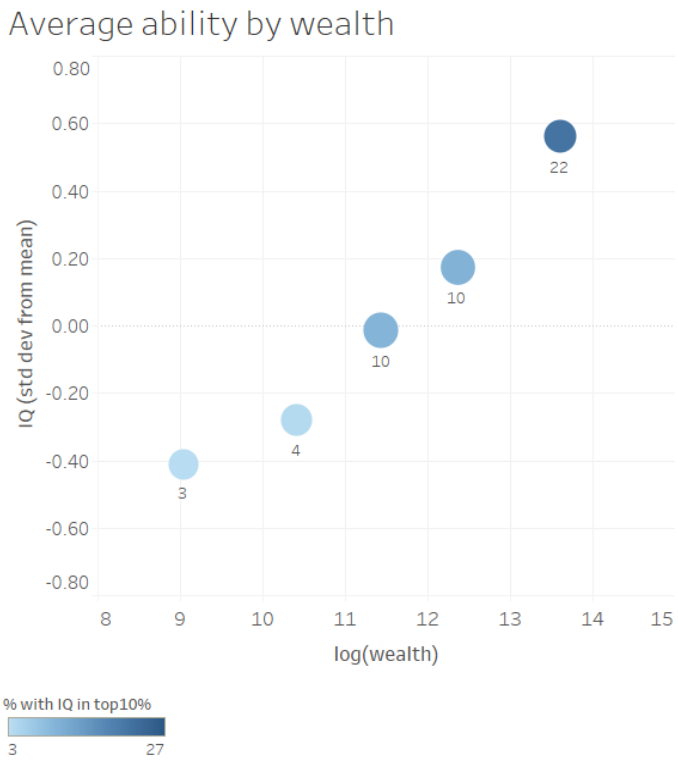


Figure 21: Correlation of wealth and IQ

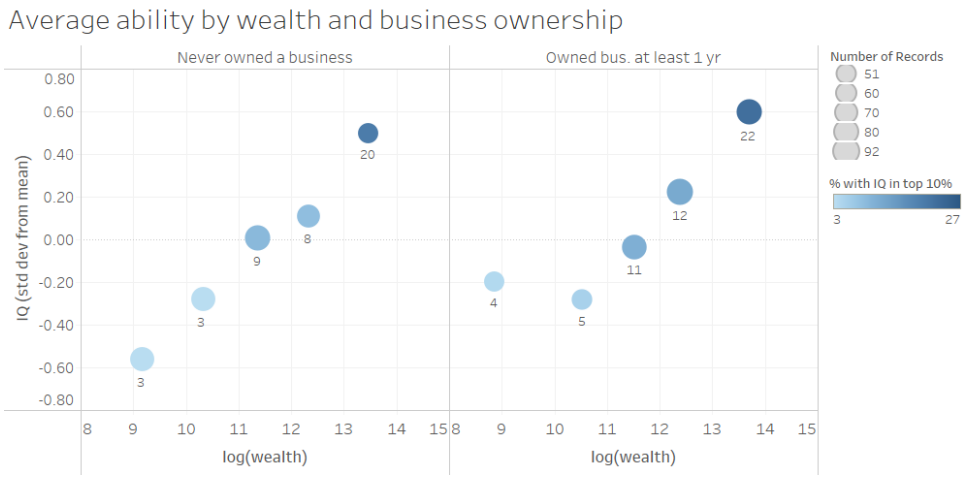


Figure 22: Correlation of wealth and IQ - separating business owners

Table 19: Summary statistics by parental wealth and parental business ownership

parent business	parent wealth ranking	N	% ever own bus	% ever own incorp	% college grads	% spouse college grad	% both college grads	IQ (std dev from mean)	% IQ above median	% IQ in top10%	% IQ in bottom 10%	% moved states	Mean wealth decile
Parents did NOT own a business	Q1	265	30	6	10	13	5	-0.55	24	6	22	18	3.8
	Q2	236	42	10	13	21	5	-0.17	41	4	11	22	4.7
	Q3	210	40	11	27	30	17	0.08	49	13	5	21	5.6
	Q4	180	46	14	37	44	29	0.32	62	25	7	37	6.6
	81-90%	73	49	26	49	44	34	0.56	76	26	6	34	6.5
	91-100%	37	62	43	65	52	48	0.73	87	27	0	51	7.8
	Total	1,001	40	12	24	29	17	-0.01	47	13	10	26	5.2
Business owner parents	Q1	136	50	15	14	24	10	-0.16	41	3	10	42	3.9
	Q2	153	51	11	22	26	17	-0.26	41	3	15	31	5.1
	Q3	183	47	17	34	31	20	0.18	62	11	6	30	5.1
	Q4	213	56	22	35	45	26	0.08	53	9	6	30	6.4
	81-90%	126	60	25	43	52	31	0.25	67	7	4	31	7.0
	91-100%	157	65	45	50	52	37	0.32	63	8	3	27	7.6
	Total	968	55	23	33	39	24	0.07	54	7	7	31	5.9

Table 20: Summary statistics by parental wealth and geographic mobility

moved out of state?	parent wealth rank (top1p)	N	% parents bus. owners	% ever own bus	% ever own incorp	% college grads	% spouse college grad	% both college grads	IQ (std devs from mean)	% IQ in top10%	Mean wealth decile
stayed	Q1	296	27	33	9	9	13	5	-0.43	3	3.7
	Q2	289	37	45	8	15	18	7	-0.24	4	4.7
	Q3	294	44	44	14	27	29	15	0.08	13	5.3
	Q4	264	57	52	17	30	37	21	0.03	11	6.4
	81-90%	135	64	56	25	38	40	25	0.34	12	6.7
	91-99%	122	85	68	43	46	46	34	0.32	5	7.4
	top 1%	11	100	64	64	55	56	44	0.57	20	9.5
	Total	1,411	47	47	16	24	28	16	-0.03	8	5.4
moved away	Q1	105	54	46	10	18	27	12	-0.28	11	4.3
	Q2	100	47	49	17	22	39	18	-0.13	2	5.2
	Q3	99	55	41	14	39	34	28	0.30	9	5.5
	Q4	130	48	51	21	48	58	40	0.39	22	6.6
	81-90%	64	61	56	27	61	67	46	0.50	23	6.9
	91-99%	56	68	57	39	61	62	47	0.53	25	7.6
	top 1%	6	67	67	67	100	80	80	0.90	50	8.8
	Total	560	54	49	20	39	47	31	0.19	15	5.9

Table 21: Summary statistics by ability and parental business ownership

parent business	IQ quintile	N	% ever own bus	Prop Yrs Own Bus	% ever own incorp	Prop Yrs Incorp	IQ (std devs from mean)	% college grads	% spouse college grad	% both college grads	Parent wealth decile	Mean wealth decile	top quintile	bottom quintile
Parents did NOT own a business	1	75	32	6%	9	1.5%	-1.45	3	15	4	3.7	4.2	4%	27%
	2	70	37	8%	4	0.8%	-0.54	20	18	8	4.3	4.4	9%	33%
	3	75	40	11%	13	3.2%	0.01	21	16	10	4.6	5.2	12%	20%
	4	65	49	11%	12	2.5%	0.58	34	43	23	5.6	6.2	17%	9%
	5	70	50	11%	20	2.2%	1.46	60	49	42	6.6	7.4	43%	1%
business owner parents	1	58	59	14%	17	2.4%	-1.34	14	14	9	5.6	4.8	10%	22%
	2	83	54	14%	19	4.1%	-0.55	22	26	13	5.5	5.6	14%	18%
	3	74	64	20%	22	5.1%	0.06	20	39	17	6.0	5.6	19%	18%
	4	86	56	18%	21	5.0%	0.56	37	44	26	6.6	6.3	29%	14%
	5	78	64	23%	31	9.5%	1.23	42	49	36	7.1	6.9	36%	8%

Table 22: Summary statistics by parental wealth, parental business ownership, and geographic mobility

parent business	parent wealth ranking	moved out of state?	N	% ever own bus	% ever own incorp	% college grads	% spouse college grad	% both college grads	IQ (std devs from mean)	% IQ in top10%	Mean wealth decile
Parents did NOT own a business	Q1	stayed	217	29	6	7	10	3	-0.59	3	3.7
		moved away	48	35	6	21	22	11	-0.34	20	4.6
	Q2	stayed	183	42	9	12	17	4	-0.13	4	4.6
		moved away	53	45	15	15	39	12	-0.28	5	4.8
	Q3	stayed	165	41	12	23	27	14	0.02	13	5.6
		moved away	45	33	11	40	39	26	0.36	14	5.6
	Q4	stayed	114	44	13	27	29	17	-0.01	18	6.4
		moved away	67	49	16	54	67	48	0.72	33	6.8
	81-90%	stayed	48	52	29	35	33	21	0.49	21	6.7
		moved away	25	44	20	76	65	60	0.74	40	6.2
	91-100%	stayed	18	61	39	56	31	31	0.51	13	7.3
		moved away	20	65	45	70	71	65	0.99	43	8.2
business owner parents	Q1	stayed	79	47	16	13	18	8	-0.11	3	3.9
		moved away	57	54	14	16	30	13	-0.24	4	4.0
	Q2	stayed	106	50	8	19	20	14	-0.41	5	4.8
		moved away	47	53	19	30	38	23	0.00	0	5.7
	Q3	stayed	129	47	17	32	31	16	0.15	13	4.9
		moved away	54	48	17	39	30	30	0.26	5	5.4
	Q4	stayed	150	58	21	33	43	23	0.06	7	6.4
		moved away	63	52	25	41	49	31	0.12	13	6.4
	81-90%	stayed	87	59	23	39	45	27	0.23	6	6.8
		moved away	39	64	31	51	68	38	0.31	8	7.4
	91-100%	stayed	115	69	46	45	49	35	0.32	6	7.6
		moved away	42	55	40	62	61	42	0.31	18	7.6

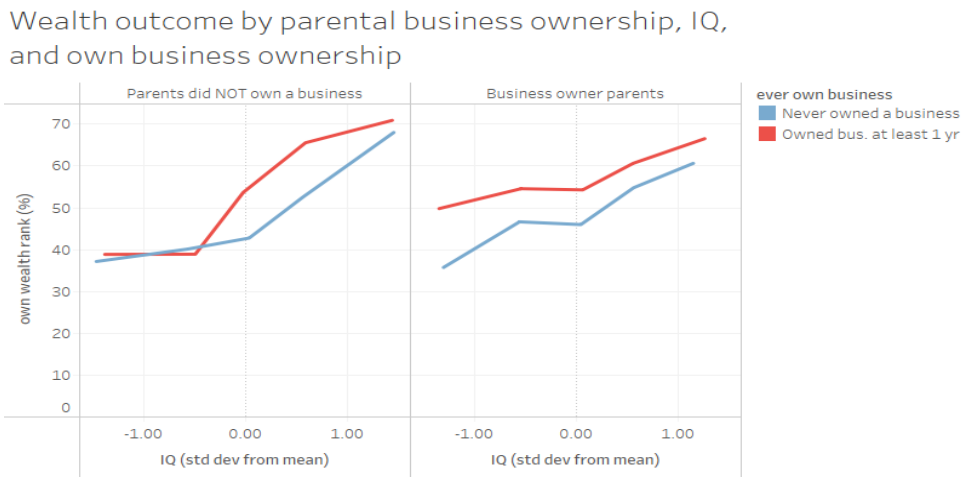


Figure 23: Outcome wealth by ability, parental business, and offspring business ownership

13.2 Other figures and tables



Figure 24: Cross-generational mobility by the type of business owned - nominal values (log scale) vs. rank

Table 23: Explaining wealth outcomes, by entrepreneurial attempt – wealth excluding the value of the business

dep. var = wealth centile	OLS				Parent FE	
excluding business value	(1)	(2)	(3)	(4)	(5)	(6)
Ever self-employed (HH)	1.57	-0.69	0.11	-1.34	-1.48	-2.83
	(1.07)	(1.27)	(1.37)	(1.44)	(1.96)	(2.08)
yrs self-emp $\geq 20\%$				3.24*		3.91
				(1.76)		(2.74)
Ever owned a business		3.95***	3.10**	0.20	2.57	0.30
		(1.25)	(1.38)	(1.47)	(2.02)	(2.19)
Owned incorporated bus.				7.72***		5.20*
				(1.72)		(2.76)
share yrs: unempl (HH)	-37.06***	-36.97***	-33.20***	-31.46***	-30.40***	-29.62***
	(4.91)	(4.87)	(5.63)	(5.60)	(8.49)	(8.43)
share yrs: out lab force (HH)	-8.98***	-8.95***	-9.63***	-9.44***	-7.94**	-7.94**
	(2.20)	(2.19)	(2.31)	(2.30)	(3.57)	(3.56)
educ = 1, HS dropout	-6.85***	-6.69***	-5.62***	-5.79***	-8.99***	-9.06***
	(1.68)	(1.68)	(1.82)	(1.84)	(3.03)	(3.05)
educ = 2, some college	2.27	2.39	-0.07	-0.43	0.40	0.12
	(1.50)	(1.50)	(1.65)	(1.64)	(2.60)	(2.62)
educ = 3, college grad	12.50***	12.45***	8.97***	8.51***	5.60*	5.50*
	(1.70)	(1.70)	(1.86)	(1.84)	(3.06)	(3.03)
educ = 4, grad school	13.55***	13.50***	9.00***	8.74***	7.21*	6.77*
	(2.31)	(2.32)	(2.31)	(2.29)	(3.79)	(3.70)
share yrs (40-55): married	19.78***	19.70***	20.04***	20.02***	21.75***	21.77***
	(1.43)	(1.43)	(1.53)	(1.51)	(2.49)	(2.46)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Mid-age state FE	Yes	Yes	Yes	Yes	Yes	Yes
Age + age sq	Yes	Yes	Yes	Yes	Yes	Yes
Birth year+gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Parents' educ+state+immig+race	Yes	Yes	Yes	Yes	-	-
Parents' wealth cent FE	-	-	Yes	Yes	-	-
Parent empl+bus+industry	-	-	Yes	Yes	-	-
Mother's marital status	-	-	Yes	Yes	-	-
Parent FE	-	-	-	-	Yes	Yes
-	-	-	-	-	-	-
Num observations	2198	2198	1914	1914	1595	1595
Num clusters	1033	1033	899	899	577	577
R^2	0.408	0.411	0.488	0.496	0.720	0.723
Adj R^2	0.363	0.366	0.405	0.413	0.506	0.510

Notes: Each observation represents an individual in the PSID sample, with wealth taken as the median percentile over the individual's appearances in PSID while between 40 and 55 years old. Only individuals born between 1950 and 1973 and whom we can observe during at least 5 years between 18 and 40 are included. Parents' wealth is computed as the wealth rank of the mother's household during middle age (40-55), supplemented with the data from the mother's late-middle age (56-65) when needed. The last 2 columns introduce fixed effects at the level of the parent (specifically, the main working parent). In all columns the dependent variable is outcome wealth percentile.

* "Parent's" employment (including self-employment), business ownership, industry, and fixed effects (cols 3 and 4) refers to the main earner in the family unit (usually the father, unless a father is not present or the mother works more years). Education is usually available for both parents and therefore reported for both. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 24: Rank-based intergenerational elasticity of wealth, interactions – controlling for parent wealth centile fixed effects

entrep=	bus owner	incorp	uninc only	self-emp
dep var=pctile wealth	(1)	(2)	(3)	(4)
Parent wealth cent FE	Yes	Yes	Yes	Yes
entrep	6.04***	13.67***	-1.83	3.18**
	(1.29)	(1.88)	(1.35)	(1.25)
(pctile par wealth-50)**entrep*	0.03	-0.02	-0.07	0.08*
	(0.04)	(0.06)	(0.05)	(0.04)
Demographic vars	Yes	Yes	Yes	Yes
Num observations	1979	1979	1979	1979
Num clusters	921	921	921	921
R^2	0.303	0.320	0.295	0.298
Adj R^2	0.235	0.254	0.226	0.229

Notes: This table reprises the regressions from columns 2 to 5 from table 16, introducing full flexibility in estimating parent wealth intercepts.

Table 25: Intergenerational elasticity of wealth, interactions

entrep=	–	bus owner	incorp	uninc only	self-emp
dep var=pctile wealth	(1)	(2)	(3)	(4)	(5)
ln(parent wealth)-ave	0.46***	0.46***	0.41***	0.50***	0.42***
	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
(ln(par wealth)-ave)^2	0.04***	0.04***	0.03***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
entrep		0.46***	0.86***	-0.04	0.23***
		(0.08)	(0.10)	(0.08)	(0.08)
(ln(par wealth)-ave)**entrep*		-0.04	-0.02	-0.15***	0.07
		(0.05)	(0.07)	(0.05)	(0.05)
Demographic vars	Yes	Yes	Yes	Yes	Yes
Num observations	1859	1859	1859	1859	1859
Num clusters	883	883	883	883	883
R^2	0.254	0.271	0.285	0.258	0.259
Adj R^2	0.222	0.238	0.254	0.225	0.226

Notes: $entrep$ stands in for the different entrepreneurial categories: whether anyone in the individual's household was ever a business owner (cols 1 and 2), an incorporated business owner (col 3), or whether they only owned unincorporated business(es) (col 4), or whether either the individual or their spouse was ever self-employed (col 5). Interactions of the category indicators (*entrep*) and the square of log wealth were attempted but dropped due to a lack of statistical significance.

Table 26: Determinants of business ownership and self-employment

dep var = was anyone in HH:	a business owner			self-employed		
			incorp. bus.			SE$>20\%$
	(1)	(2)	(3)	(4)	(5)	(6)
Parent[a] business owner/self-emp		0.077***	0.047**		0.101***	0.059**
		(0.027)	(0.022)		(0.030)	(0.024)
educ = HS dropout	-0.033	-0.029	-0.018	0.003	0.007	-0.012
	(0.038)	(0.040)	(0.027)	(0.037)	(0.039)	(0.030)
educ = some college	-0.020	-0.017	0.009	0.040	0.045	0.067***
	(0.032)	(0.032)	(0.023)	(0.029)	(0.030)	(0.025)
educ = college grad	0.018	0.024	0.056**	0.006	0.011	0.011
	(0.037)	(0.038)	(0.028)	(0.035)	(0.035)	(0.029)
educ = grad school	0.037	0.031	0.035	0.055	0.052	0.075*
	(0.048)	(0.049)	(0.035)	(0.046)	(0.047)	(0.039)
parent wealth dec = 2, 2	0.003	-0.016	-0.054	-0.025	-0.043	-0.035
parent wealth dec = 3, 3	0.079	0.046	-0.031	0.019	-0.003	0.008
parent wealth dec = 4, 4	-0.023	-0.048	-0.059	-0.023	-0.044	-0.007
parent wealth dec = 5, 5	0.006	-0.028	-0.028	-0.049	-0.063	-0.020
parent wealth dec = 6, 6	-0.054	-0.090	-0.032	-0.060	-0.080	-0.027
parent wealth dec = 7	0.056	0.017	0.032	0.027	0.006	0.042
parent wealth dec = 8	0.069	0.031	-0.028	0.040	0.011	0.057
parent wealth dec = 9	0.067	0.019	0.036	0.017	-0.037	-0.008
parent wealth = 90-99%	0.133**	0.057	0.175***	0.073	-0.007	0.005
parent wealth = Top 1%	0.133	0.059	0.334***	0.118	0.071	0.147
Own+parents' education	Yes	Yes	Yes	Yes	Yes	Yes
Own+parent's industry	Yes	Yes	Yes	Yes	Yes	Yes
Childhood state	Yes	Yes	Yes	Yes	Yes	Yes
Birth year+gender+marital	Yes	Yes	Yes	Yes	Yes	Yes
Immig background+race	Yes	Yes	Yes	Yes	Yes	Yes
Num observations	1979	1930	1930	1979	1924	1924
Num clusters	921	905	905	921	901	901
R^2	0.128	0.134	0.165	0.152	0.163	0.141
Adj R^2	0.0775	0.0760	0.108	0.103	0.106	0.0830

Notes: The dependent variables are indicators for whether the household owned a business (cols 1 and 2), owned an incorporated business (col 3), had a self-employed member (cols 4 and 5), and had a self-employed member at least 20% of the time. Indicators are multiplied at 100.

[a] The first independent variable is an indicator for whether the main earning parent owned a business (cols 1-3) or was self-employed (cols 5-6). Similarly, "same industry" compares the mode industry of the main earning parent with the mode industry over the individual. Standard errors are robust and clustered at the level of the original (1968) household. Significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 27: Determinants of business ownership and self-employment

dep var = was anyone in HH:	a business owner			self-employed		
			incorp. bus.			SE> 20%
	(1)	(2)	(3)	(4)	(5)	(6)
Parent[a] business owner/self-emp		0.044	0.016		0.068	0.027
		(0.042)	(0.029)		(0.050)	(0.041)
educ = HS dropout	-0.033	-0.048	-0.006	0.003	0.000	-0.015
	(0.038)	(0.048)	(0.035)	(0.037)	(0.045)	(0.033)
HS dropout × parent bus/SE		0.048	-0.025		0.032	0.016
		(0.082)	(0.052)		(0.090)	(0.075)
educ = some college	-0.020	-0.041	0.007	0.040	0.016	0.040
	(0.032)	(0.042)	(0.028)	(0.029)	(0.033)	(0.028)
some college × parent bus/SE		0.054	0.011		0.106	0.100*
		(0.061)	(0.044)		(0.070)	(0.059)
educ = college grad	0.018	0.017	0.010	0.006	0.004	0.004
	(0.037)	(0.051)	(0.034)	(0.035)	(0.039)	(0.031)
college grad × parent bus/SE		0.021	0.095*		0.030	0.029
		(0.066)	(0.049)		(0.075)	(0.062)
educ = grad school	0.037	-0.016	-0.025	0.055	0.067	0.084*
	(0.048)	(0.069)	(0.043)	(0.046)	(0.053)	(0.046)
grad school × parent bus/SE		0.094	0.116*		-0.044	-0.024
		(0.085)	(0.062)		(0.095)	(0.076)
parent wealth dec = 2, 2	0.003	-0.021	-0.058	-0.025	-0.045	-0.038
parent wealth dec = 3, 3	0.079	0.042	-0.035	0.019	-0.005	0.005
parent wealth dec = 4, 4	-0.023	-0.052	-0.062	-0.023	-0.046	-0.009
parent wealth dec = 5, 5	0.006	-0.030	-0.027	-0.049	-0.066	-0.023
parent wealth dec = 6, 6	-0.054	-0.095	-0.035	-0.060	-0.081	-0.028
parent wealth dec = 7	0.056	0.014	0.034	0.027	0.005	0.041
parent wealth dec = 8	0.069	0.029	-0.028	0.040	0.007	0.053
parent wealth dec = 9	0.067	0.018	0.037	0.017	-0.039	-0.010
parent wealth = 90-99%	0.133**	0.053	0.174***	0.073	-0.012	-0.000
parent wealth = Top 1%	0.133	0.052	0.330***	0.118	0.067	0.142
Own+parents' education	Yes	Yes	Yes	Yes	Yes	Yes
Own+parent's industry	Yes	Yes	Yes	Yes	Yes	Yes
Childhood state	Yes	Yes	Yes	Yes	Yes	Yes
Birth year+gender+marital	Yes	Yes	Yes	Yes	Yes	Yes
Immig background+race	Yes	Yes	Yes	Yes	Yes	Yes
Num observations	1979	1930	1930	1979	1924	1924
Num clusters	921	905	905	921	901	901
R^2	0.128	0.135	0.168	0.152	0.165	0.143
Adj R^2	0.0775	0.0748	0.110	0.103	0.106	0.0834

Notes: The dependent variables are indicators for whether the household owned a business (cols 1 and 2), owned an incorporated business (col 3), had a self-employed member (cols 4 and 5), and had a self-employed member at least 20% of the time. Indicators are multiplied at 100.

[a] The first independent variable is an indicator for whether the main earning parent owned a business (cols 1-3) or was self-employed (cols 5-6). Similarly, "same industry" compares the mode industry of the main earning parent with the mode industry over the individual. Standard errors are robust and clustered at the level of the original (1968) household. Significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 28: Explaining wealth outcomes – the importance of parental entrepreneurship

dep var = wealth percentile	(1)	(2)	(3)	(4)	(5)
Ever self-employed (HH)	0.23	-1.77	-1.70	-2.08	-1.96
	(1.33)	(1.50)	(1.43)	(1.66)	(1.65)
SE ever * parent SE ever		7.43***		2.51	2.59
		(2.71)		(3.01)	(3.02)
yrs self-emp $\geq$ 20%			4.30**	1.29	1.27
			(1.76)	(2.21)	(2.21)
SE yrs $\geq$ 20% * parent SE ever				9.03**	
				(3.69)	
$\times$ non-college grads					13.69***
					(3.99)
$\times$ college grads					-1.57
					(5.01)
Ever owned a business	4.64***	2.98*	0.99	1.00	0.83
	(1.36)	(1.73)	(1.42)	(1.80)	(1.80)
owned bus * parent owned bus		3.33		-0.30	-0.41
		(2.45)		(2.68)	(2.67)
Owned incorporated bus.			9.37***	5.97**	6.23**
			(1.80)	(2.77)	(2.78)
owned incorp * parent owned bus				5.88*	6.25*
				(3.47)	(3.42)
Parent ever self-empl	1.47	-2.19	1.23	-2.27	-2.31
	(1.82)	(2.13)	(1.77)	(2.10)	(2.10)
Parent ever owned business	-3.48**	-4.93**	-3.67**	-4.27**	-4.25**
	(1.57)	(1.91)	(1.55)	(1.91)	(1.90)
Yrs unempl+olf	Yes	Yes	Yes	Yes	Yes
Educ+industry	Yes	Yes	Yes	Yes	Yes
Mid-age state FE	Yes	Yes	Yes	Yes	Yes
Age+age sq+married	Yes	Yes	Yes	Yes	Yes
Birth year+gender FE	Yes	Yes	Yes	Yes	Yes
Parents' educ+state+immig+race	Yes	Yes	Yes	Yes	Yes
Parents' wealth cent FE	Yes	Yes	Yes	Yes	Yes
Parent empl+bus+industry	Yes	Yes	Yes	Yes	Yes
Mother's marital status	Yes	Yes	Yes	Yes	Yes
Parent FE	-	-	-	-	-
-	-	-	-	-	-
Num observations	1914	1914	1914	1914	1914
Num clusters	899	899	899	899	899
R^2	0.479	0.483	0.491	0.497	0.501
Adj R^2	0.393	0.398	0.407	0.413	0.416

Notes: OLS regressions introducing interactions between own and parental experience in self-employment and business ownership. Column 1 reprises the specification from column 3 of table 6, while column 3 is the same as column 4 of table 6. Standard errors are robust and clustered at the level of the original (1968) household, and significance indicated is at 10%(*), 5%(**), and 1%(***).

Table 29: Entrepreneurship as a function of ability

IQ quintile	N	% ever self-emp (HH)	% yrs self-emp (HH)	% ever own bus	% yrs own bus	% ever own incorp	% yrs own incorp	% high school grads	% college grads
1	133	43	9	44	10	13	1.8	74	8
2	152	41	11	46	12	13	2.6	86	21
3	148	43	13	52	16	18	4.2	89	21
4	151	45	13	53	15	17	3.9	93	36
5	149	48	15	57	18	26	6.0	98	50
Total	733	44	12	51	14	17	3.8	88	28

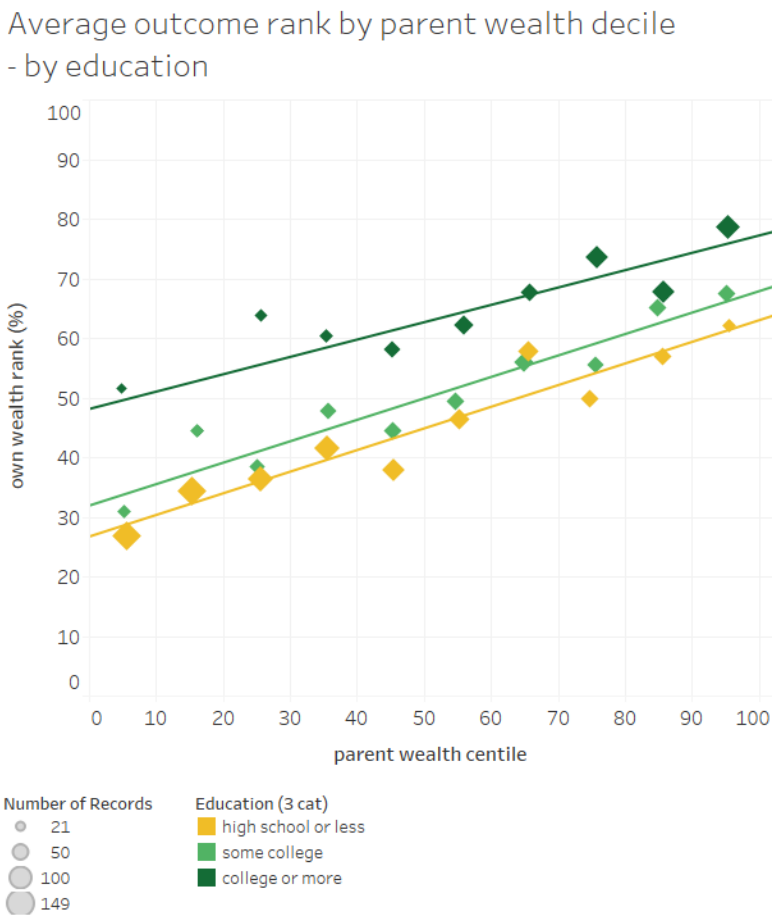


Figure 25: Relative mobility: incorporated business ownership and college completion

Table 30: Standard deviation in the difference between individual IQ and the average for the group

IQ correlation within families is much greater than within socioeconomic group

Std. dev. of IQ difference from sample mean	0.8217
Std. dev. of IQ difference from parent decile mean	0.7864
Std. dev. of IQ difference from decile mean	0.7704
Std. dev. of IQ difference from (decile)*(educ level) mean	0.7260
Std. dev. of IQ difference from centile mean	0.7182
Std. dev. of IQ difference from siblings mean	0.5295

Note: recall that IQ is based on a person's children's scores on a problem solving test, so the correlation between siblings is actually between cousins