Stairway to Heaven?
Selection into Entrepreneurship, Income Mobility and Firm Performance[*]

Jarkko Harju[†]   Toni Juuti[‡]   Tuomas Matikka[§]

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Abstract

Using comprehensive full-population panel data from Finland, we provide evidence on selection into entrepreneurship and the dynamic implications of establishing a new business. We document that individuals at the very top of the personal income distribution are much more likely to start a new incorporated business compared to others. There is no similar selection based on parental income, but more than half of new entrepreneurs have entrepreneurial parents. The average income gains associated with entrepreneurship over comparable wage earners ten years after starting the business are roughly 20% and very similar across both personal and parental income distributions. However, key firm-level outcomes such as growth and productivity are positively related with personal income. We show supportive evidence that this finding can be rationalized by both ability and liquidity. In contrast, we find no significant differences in firm outcomes by parental income or parental background in entrepreneurship. Finally, we show that both selection and income gains from entrepreneurship are reflected in the share of entrepreneurs at the top of the distribution.

Keywords: entrepreneurship; income development; income mobility; productivity; inequality.

JEL Codes: L26; J24; J3

1 Introduction

Risk-taking entrepreneurs are pivotal for generating growth, innovation and employment opportunities in modern economies (see e.g. Aghion et al. 2018a, Decker et al. 2014). Entrepreneurs are often rewarded of their risk-taking as they usually govern the top of the income distribution in many developed countries (e.g. Smith et al. 2022, 2019, Halvarsson et al. 2018). A large literature has studied selection into entrepreneurship, and recent findings highlight the association between various personality traits and being a business owner or succeeding as an entrepreneur (Levine and Rubinstein 2017, Kerr et al. 2017). However, there is still limited evidence on selection to entrepreneurship based on individual and parental incomes, and who are those particularly benefiting from entrepreneurship. Does starting a new firm increase the incomes of those who are already wealthy, or does it provide a "Stairway to Heaven" for those coming from less well-off backgrounds?

Our study integrates various separate strands of literature concerning the selection into entrepreneurship and success of entrepreneurs (Kerr et al. 2017, Levine and Rubinstein 2017), intergenerational mobility of business owners (Hundley 2008, Lindquist and Vladasel 2022), the role of individual (Levine and Rubinstein 2020, Queiro 2022) and parental (Hurst and Pugsley 2011, Lindquist et al. 2015, Hurst and Lusardi 2004) characteristics behind entrepreneurial activity, and the role of entrepreneurship behind top incomes (Kopczuk and Zwick 2020, Smith et al. 2022, 2019, Piketty et al. 2017). We have four main contributions to the existing evidence. First, we are the first to follow new business owners long before and after they established their first business. This allows for a detailed analysis of selection into entrepreneurship and how becoming an entrepreneur shapes the income trajectories of individuals, without conditioning on the success of the business. Furthermore, this approach enables us to provide visually clear and tractable evidence on the income development of entrepreneurs, which is missing from the earlier literature. Second, as we can follow individuals over time and have an opportunity to link children with their parents, we can analyze both intra- and intergenerational income mobility of entrepreneurs within the same

1

data and context. Third, by combining the findings on selection and the income gains from entrepreneurship, we illustrate how new entrepreneurship contributes to top-end inequality and the share of business owners at the top of the distribution. Fourth, our paper is the first to link new business owners to their newly established firms, providing us the opportunity to examine whether individual and parental background matter for firm success. This novel feature enables us to go beyond individual-level outcomes and study how individual and parental characteristics are linked with the growth of new firms, and their implications on welfare and productivity in the society more broadly.

A necessary requirement for our study is the opportunity to utilize extensive and detailed population-wide Finnish panel data. The data sets combine the income registers of wage earners, incorporated business owners, sole proprietors and the owners of partnerships, and their firm characteristics and financial statements. These data contain detailed information on key individual and parental characteristics, the start dates of the businesses and the ownership structures of firms. With these data we can provide convincing stylized evidence on selection into entrepreneurship, and the long-run dynamic implications of entrepreneurship on income mobility, top-end inequality and firm-level outcomes.[1]

Levine and Rubinstein [2017] and the subsequent literature highlight the importance of separating business owners to those who set up incorporated and unincorporated businesses. Similarly as most recent papers focusing on entrepreneurship, our main focus lies on analyzing incorporated business owners. They constitute separate legal entities with limited liability encouraging growth and risk-taking, compared to unlimited liability of the owners of unincorporated businesses. Consistent with this characterization, earlier literature documents significant heterogeneity in typical tasks, incomes and personality traits between

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[1]Previous studies on business owners using Finnish data have documented that entrepreneurship appears to be a character trait that runs in the family (Uusitalo 2001) and that smaller firms spawn new entrepreneurs more frequently than larger firms (Hyytinen and Maliranta 2008). Within-twin analysis (Hyytinen et al. 2013) suggests that entrepreneurs earn a negative earnings premium, work more, have greater responsibilities, but also have a greater control over their work, while previous experience in a high-productivity firm strongly predicts high productivity and probability of survival for the entrepreneur's new firm (Maliranta and Nurmi 2019). Finally, the recent studies on Finnish inventors (Aghion et al. 2017, 2018b, 2022) also use similar data as we do.

the owners of different company forms, and typically find that the owners of incorporated businesses are those that end up earning much more compared to other business owners and wage earners (see e.g. Hamilton 2000, Lazear 2005, Hurst and Pugsley 2011, Levine and Rubinstein 2017, 2020, Lindquist and Vladasel 2022).

Our approach departs from the earlier literature in one essential aspect. We carefully consider the timeline of entrepreneurship, and focus on the dynamic implications of starting a first new active business with no prior history as an entrepreneur. This approach has several advantages. First, we can measure individual income development before the first firm was established, allowing us to more rigorously consider how earnings are associated with selection into entrepreneurship. Second, our analysis is not conditional on firm success or "making it" as an entrepreneur, as we also include those entrepreneurs who choose to set up a business but whose firms do not succeed. Most earlier studies rely on small-scale surveys or cross-sectional data sets, which typically overweight business owners who succeeded and remained as entrepreneurs. Our empirical analysis illustrates that this is not a trivial issue. We find that the association between parental income and selection to entrepreneurship differs significantly depending on whether we condition on firm survival or not.

As our first result we find that individuals at the very top of the distribution are distinctively more likely to establish a new incorporated business, in comparison to individuals elsewhere in the distribution. In contrast, there is no similar difference in the likelihood for the owners of new unincorporated firms, and their likelihood of starting a new firm is decreasing in individual income. This means that a significant share of incorporated entrepreneurs were top-income earners already before they started their business. Previous literature has well acknowledged the general connection between incomes and the likelihood of being an incorporated business owner (Levine and Rubinstein 2017, 2020, Kerr et al. 2017). Our granular analysis highlights that this selection occurs very non-linearly only at the very top of the income distribution.

However, selection into incorporated entrepreneurship is not driven by parental income,

as the likelihood of starting a new business is slightly decreasing in parental income. But when we rely on cross-sectional data that overweight *successful* business owners compared to all individuals starting a business, we find a larger share of incorporated business owners coming from high-income families. This discrepancy is driven by the fact that the firms founded by those with higher-income parents are more likely to survive compared to others. Therefore, by focusing on all new business owners regardless of their success enables us to more rigorously analyze selection to *starting* a business, and how it is associated with income mobility in the future. This comparison is also intriguing in the light of previous evidence from the US regarding successful inventors, who are observed to overwhelmingly come from high-income families (Bell et al. 2019).

We do not observe significant selection into entrepreneurship based on many other observable characteristics such as age, industry, occupation or education. However, similarly as in many previous studies (see e.g. Lindquist et al. 2015, Dunn and Holtz-Eakin 2000, Uusitalo 2001), we find that parental background in entrepreneurship is heavily associated with starting a new business. Nevertheless, parental entrepreneurship is not driving the link between individual incomes and selection to starting a firm, as the likelihood of becoming a new entrepreneur is pronounced at the top of the earnings distribution for both those with and without entrepreneurial parents.

By utilizing the timeline before and after the start of a firm, we next show that the average disposable incomes of incorporated entrepreneurs slump in the year when the business is started by approximately 10%. Their incomes then quickly catch up, and after 4–5 years their income trajectories are approximately 10% above those of regular wage earners. This rapidly ascending trend continues over a longer time period, and after ten years the business was established those who self-selected to become new entrepreneurs earned on average 21% more in a year than comparable wage earners (relative to the year before the firm was established). However, this average income gain from incorporated entrepreneurship reduces to 15% when controlling for the selection into entrepreneurship based on individual income

ranks before the firm was established. This observation underlines the key importance of accounting for selection based on earnings when evaluating the dynamic income implications of entrepreneurship, in addition to the argument of considering various types of observed personality traits in the previous literature. Furthermore, we find no differences in the income trajectories of business owners with or without entrepreneurial parents, suggesting that parental background in entrepreneurship does not explain average income gains from entrepreneurship.

We then zoom into the distribution to analyze how entrepreneurship affects income mobility. Our results suggest that the income gains from incorporated entrepreneurship relative to paid employment are rather evenly distributed across the individual distribution. Even though top earners are much more likely to become incorporated business owners, the relative gains from entrepreneurship are not positively correlated with the initial income rank. If anything, the relative gain somewhat decreases at the top. On the contrary, individual gains from entrepreneurship are slightly larger for those with higher parental income, although our evidence suggests no clear selection into entrepreneurship from high-income families.

In addition, we observe that the likelihood of reaching the top 1% and 10% of the income distribution is significantly higher for new entrepreneurs compared to wage earners in the bottom and middle of the income distribution after 10 years the business was established. Relatedly, we find no clear difference in the likelihood of dropping to the bottom of the distribution for entrepreneurs compared to wage earners. Together with the evenly distributed gains over the distribution, these observation suggests that entrepreneurship is linked with upward income mobility in the society.

However, our general finding on upward mobility of entrepreneurs requires two important remarks. First, when examining both individual and parental distributions jointly, our results suggest that entrepreneurship appears to benefit particularly high-income individuals coming from high-income families. Therefore, despite the significant income gains at the middle and bottom of both personal and parental distributions compared to wage earners, the gains from

5

entrepreneurship are still larger for high-income earners coming from high-income families. Second, entrepreneurship is not associated with larger intergenerational mobility among those who self-selected to start a business. Income rank correlations between parents and their children who started a new incorporated business are smaller than for wage earners, but this correlation was small already before the first firm was established. This illustrates that the high intergenerational mobility among entrepreneurs is driven by self-selection to starting a business, similarly as was observed by Lindquist and Vladasel [2022] in a recent study from Sweden. Thus, this finding does not support the popular view that entrepreneurship provides a principal avenue for increasing intergenerational mobility in the society (see e.g. Holtz-Eakin and Rosen 2003, Fairlie 2004).

Combining our findings on selection and mobility demonstrate that the substantial income gains from entrepreneurship shape the top of the income distribution, but a large portion of the over-representation of entrepreneurs at the top can be allotted to selection. We find that approximately 17% of new entrepreneurs were top 10% earners already in the year before the firm was established. Ten years after establishing the business this share has increased to almost 36%. Therefore, new entrepreneurs appear to govern the top of the distribution even before starting a business due to positive self-selection by income, but their relevance at the top is further enhanced by the positive average income gains associated with incorporated entrepreneurship. To further illustrate the role of entrepreneurs at the top of the distribution, we find that business income and other capital income clearly dominate at the very top of the income distribution in Finland, similarly as in the US (Smith et al. 2019). When zooming into the top 0.1% of the market income distribution, the share of capital and business income is above 60% and wage income falls below 40% of aggregate market income.[2]

Next, we extend our analysis from individual-level income development to firm-level

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[2]When we divide earnings retained in firms to the incorporated business owners, the share of business and capital income out of total market income increases to 80% at the top 0.1% of the distribution. Incorporating retained earnings into our timeline around the start as an entrepreneur increases the income levels of new business owners by an almost constant annual share of 15%, starting right from the first year after the business was established.

6

outcomes. To our knowledge, our study is the first to go beyond individual outcomes by linking individual and parental backgrounds of new business owners with detailed data on their firms. Our paper thus provides novel evidence to the question of how individual and parental incomes are linked with firm success. Recent literature proposes that individual income is linked with entrepreneurial ability (Levine and Rubinstein 2020, Fairlie 1999), driven by the assumption that the skills rewarded at the labor market through higher wages are similar to those associated with the ability to run a successful business. In addition, liquidity could also affect the likelihood of becoming an entrepreneur (Levine and Rubinstein 2020, Hurst and Lusardi 2004, Holtz-Eakin et al. 1994), and the success of the business. Furthermore, earlier literature argues and underlines the role of parental background and the associated human capital channel in explaining entrepreneurial traits (see e.g. Dunn and Holtz-Eakin 2000, Hurst and Lusardi 2004, Hurst and Pugsley 2011, Lindquist et al. 2015), which could also impact the success of the business.

We find that the scale (sales, employment) and productivity (value added, R&D investments) of the established business is increasing in individual income. This means that the firms founded by top income earners appear to be, on average, more productive and successful compared to those run by middle or low-income earners. In addition, we observe that the initial capital stock invested in the new firm is larger for top income earners compared to others, which suggest that at least part of this effect is likely driven by capital assets in addition to individual ability.

In contrast, we find that parental income does not explain firm success, as business activity measures do not significantly vary by parental income rank. The initial capital stock of the firm is not increasing in parental income either, suggesting that parental income is not directly linked with firm-level assets. Furthermore, we find that firm outcomes are not associated with parental background in entrepreneurship, as firm-level outcomes develop very similarly for both those with and without entrepreneurial parents. This is perhaps surprising in the light of previous literature that underlines the key role of human capital stemming

from the entrepreneurial traits of parents (Dunn and Holtz-Eakin 2000, Hurst and Lusardi 2004, Hurst and Pugsley 2011, Lindquist et al. 2015). Our findings suggest that despite the fact that entrepreneurship often runs in the family, second-generation entrepreneurs who establish a new business do not appear to succeed better compared to those whose parents were not business owners. This finding, therefore, does not lend support to the popular idea of inheritable traits creating successful business owners.

Finally, the Finnish institutional and societal setting can differ compared to other countries particularly outside Europe, which could affect the external validity of our findings. However, we find that many key observations, such as the role of parental background in selection into entrepreneurship, average income gains from incorporated entrepreneurship and the share of business income at the very top of distribution, are strikingly similar in Finland compared to the evidence from other counties (see Dunn and Holtz-Eakin 2000, Lindquist et al. 2015, Levine and Rubinstein 2017, Smith et al. 2019), which strengthens the external validity of our descriptive results.

The paper proceeds as follows: Section 2 describes the data and explains the detailed definitions and the empirical approach we use in our analysis. Section 3 presents the results on selection into entrepreneurship, and Section 4 on the income dynamics, mobility and firm performance. Section 6 presents the analysis on top-end inequality and Section 7 presents additional results. Section 8 concludes.

2 Data, Definitions and Methods

2.1 Data

Our analysis builds on population-wide administrative data from Statistics Finland and Finnish Tax Administration. These data enable us to link together individual-level income information and background characteristics, firm ownership information and date of establishment, and firm-level tax returns and financial statements. We provide a comprehensive

list of key variables and definitions we use in our analysis in Appendix C.

Individual-level Information. The individual-level data from Statistics Finland include various income and personal characteristics, such as detailed annual income information (wages, dividends, capital gains and other sources of earned and capital income), education (highest degree in the end of year), age, place of residence, marital status, and the number of children. The data contain the universe of individuals living in Finland from 1987 to 2019 with unique individual-year identifiers. We can also link children to their parents (biological and adoptive) for all individuals born after 1952 and permanently living in Finland on the last day of each year. This allows us to connect the earnings of parents to their children.

Firms. Our firm-level data set includes annual financial statements (profit and loss accounts, balance sheet information) from Statistics Finland, firm-level tax return information from the Finnish Tax Administration, and the establishment dates of firms from the Finnish Patent and Registration Office from 1997 to 2019. The data include firm-year identifiers and additional background characteristics for firms such as industry classification codes and the organizational form.

Ownership Information. We use two data sets to identify the ownership structures of businesses. First, for the owners of privately held corporations, we use two separate data sets: 1) the main owner information from the Tax Administration for those owners who received dividend income from their firm, available from 1997–2016, and 2) the full ownership database from Statistics Finland (Finnish Longitudinal Owner-Employer-Employee Data or FLOWN), which is based on information collected annually with the Finnish Tax Administration's form 6B and supplementary form 72, available from 2006–2019. Combining these data enable us to track down the main owners with dividend income from their firm from 1997–2005 and the full ownership structure from 2006–2018.[3] Second, we use a data set including all self-

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[3]Figure A1 in Appendix A shows the shares of new incorporated and unincorporated entrepreneurs by year. As is visible from the figure, for incorporated entrepreneurs there is a data break in 2006, as we only

employed and partnership owners from the Tax Administration available from 1997–2016. Both of these data sets include unique firm-owner-year identifiers, and thus we can merge these data with all individual-level data sets.

Sample Restrictions. Similarly as in the recent literature on the income development and personality traits of entrepreneurs (Levine and Rubinstein 2017, Halvarsson et al. 2018), we restrict our baseline sample to individuals who are 25–64 year old when establishing their business and to individuals with positive annual wage income and/or entrepreneurial income. We also restrict our main sample to those individuals for whom we observe child-parent links. This last restriction drops all individuals born before 1953 from the sample.

2.2 Definitions

Incorporated and Unincorporated Entrepreneurs. A key question in our study and earlier work is how to define different types of business ownership. The literature has long acknowledged that various types of businesses and their owners can differ significantly from each other in terms of their the type of business activity (see e.g. Lazear 2005). For example, Evans and Leighton [1989] and Hurst and Pugsley [2011] illustrate that only a few self-employed businesses seek to engage in growth-targeted activities. Levine and Rubinstein [2017] show that incorporated entrepreneurs are more likely engaging in activities that are closely related to tasks that increase productivity and demand stronger cognitive skills, compared to unincorporated business owners who are less likely to conduct non-routine cognitive tasks. Levine and Rubinstein [2017] also argue that the key legal differences that separate the incorporated firms from the unincorporated, namely separate legal entity and limited liability of the owners, make an incorporated business more preferable for entrepreneurs who seek to engage in more risky business ventures. Recent findings by Levine and Rubinstein

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observe the main owners receiving dividends from his/her firm before 2006, and from that onward we observe all main owners of incorporated firms. We use all the firm starts in our baseline analysis. Our main findings are not sensitive to using data before or after 2006, as shown in Appendix A Table A2 and discussed in Section 7.

[2017] and Halvarsson et al. [2018] highlight that the incomes of the owners of incorporated and unincorporated businesses differ significantly from each other, such that the owners of incorporated businesses earn much more compared to other business owners and wage earners in both the US and Sweden. Therefore, it is likely that pooling all self-employed and other business owners together would mask important heterogeneity in income development and income mobility across different types of business owners.

In the Finnish context, there are also several key features that differ between unincorporated firms, consisting of sole proprietors (single owner) and partnership firms, and incorporated firms labeled as privately held corporations. First, the owners of unincorporated firms are personally liable for all the financial commitments such as debts and other obligations made by the firm, but the financial liability for incorporated firms is limited to the capital installed in the firm. Second, unincorporated firms are in general subject to more lenient administrative and accounting requirements compared to incorporated firms, including e.g. single-entry bookkeeping, no requirements for capital installments or assigning a board of directors. Third, in the Finnish tax system, unincorporated firms are pass-through entities, meaning that their profits are allocated to their owners as personal taxable income. In contrast, incorporated firms constitute separate tax entities, and their profits are taxed according to the corporate tax rate. Owners of privately held corporations pay a wage or dividend tax on the income withdrawn from the firm.[4] Therefore, as in many other countries and institutional contexts, an unincorporated business tends to be a more suitable choice for those who seek to run a simple business with small financial risk and no immediate intention for growth. In contrast, an incorporated firm is more suitable for entrepreneurs who are oriented towards risk-taking and growth-seeking business activities.

Following these lines of motivation, we divide business owners into incorporated (IE) and unincorporated (UIE) entrepreneurs based on the organizational form of the firm in our analysis, allowing us to track down potential differences in income trajectories and mobility

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[4]Appendix B presents a more detailed description of the differences of the tax schedules between the organizational forms.

11

outcomes between different types of business owners. We define the organizational form of the business based on its organizational form in the year when it was established, and include the owners in the analysis using this definition even if the firm later changes its organizational form.[5]

Firm Entry.   We define the first year of an incorporated business such that it is the first full year after establishment date when the firm first reports positive turnover. We use a similar turnover condition for unincorporated business but also require the owners to receive at least 50% of their gross income from the firm after establishment date. These conditions allows us to focus on only on active new businesses throughout the paper, and dropping inactive firms such as shell companies part-time entrepreneurs from the sample. Note that this definition rules out inherited firms or firm acquisitions from the sample of firm entry, as discussed in more detail below.

Firm Ownership.   Our baseline analysis focuses on the main owners of the firms, defined as individuals who own the largest share of the firm when it is established. These individuals typically bear the largest entrepreneurial risk but are also those who are likely to gain most in terms of incomes if the business ends up being successful. For IE entrepreneurs, we directly observe the ownership share for each owner in the data, and for UIE owners, we define the main owner status for the owner whose income from the firm is the largest. If two or more individuals own equal shares using the above definitions, they are all considered as main owners.

We narrow our focus on individuals who are *new* owners, defined as individuals who have no current or prior ownership of an incorporated or unincorporated firm in our data. We allow for transitions between the two types of entrepreneurship. This means that individuals can be labeled as new incorporated entrepreneurs if they had no prior ownership in incorporated

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[5]In our data, changing the organizational form is rare, as less than 3% of firms change their organizational form from unincorporated to incorporated within their first ten years.

business but were sole proprietors or involved in a partnership. We label as wage earners those individuals with positive wage income who have no ownership of *any* firm over the whole period we observe in the data.[6] This allows us to focus on the implications of new business creation on individual income development, excluding those who, for example, join an existing firm as a new partner or inherit an operating business from their parents.[7]

We define the parental background in entrepreneurship using administrative data starting from 1987. We define the parent(s) of an individual as entrepreneur(s) if he or she is labeled as a business owner for at least 5 years according to the socioeconomic status defined by Statistics Finland. This approach enables us to use a similar definition for parental entrepreneurship using our full data from 1987–2019, as the more detailed ownership data starts only from 1997.

Income Measurement.   Our baseline individual income measure is disposable income, which denotes the net-of-tax-and-benefits annual incomes of individuals from all income sources observed in our administrative data. We observe disposable incomes for all wage earners and entrepreneurs in each year, which enables a careful comparison of income development and income mobility between the groups. Furthermore, disposable income is a relevant income measure when considering income mobility outcomes in the distribution, as it also captures differences in taxation and benefits both between wage earners and business owners and between the owners of different types of organizational forms. We use market income before taxes and transfers as an alternative income measure to examine potential

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[6]Table A1 in Appendix A shows how the definitions and data availability shape the sample size for IE and UIE owners. In new incorporated businesses that show a positive turnover, there are roughly 140,000 owners in the first year of operation. Out of these, roughly 2/3 are main owners. After excluding those with no parental links in the data, we have 58,897 individuals, and finally, focusing on first-time business owner gives us our sample of 28,707 new incorporated business owners. Using similar definitions for new unincorporated entrepreneurs we end up with 61,876 business owners.

[7]Previous literature argues that inherited firms constitute only a small share among entrepreneurs. For example, they comprise 5.6% of firms in the US (Parker 2009) and 2.2% in Sweden (Lindquist et al. 2015). Furthermore, our ownership definition excludes those wage earners who, for example, join a firm as a minority partner with a very small ownership share but continue to maintain a working contract in the same firm. These types of ownership arrangements often tend to serve as a commitment tool for high-profile workers and do not represent the type of risky entrepreneurship we aim to focus on in this study.

differences of our main findings in terms of income measurement in Section 7. All income variables are presented in 2005 prices using the Consumer Price Index from Statistics Finland.

In addition to income levels, we analyze the relative income development and income mobility of individuals by using individual and parental income ranks. These denote the individual's relative position in the income distribution by percentile or decile points. We define the ranks for each individual in the full population consisting of both wage earners and entrepreneurs before the firm was established. We define the parental income ranks using a distribution of average annual household disposable income of parents when they were 45–50 year old. Thus, we are able to define the ranks for those individuals whose parents were of that age after 1987, which is the first year observed in our data.

2.3 Methods and Outcomes

Timeline. We clearly acknowledge that starting a business and becoming an entrepreneur are not exogenous events. We further underline this by providing detailed evidence on selection into entrepreneurship below. Therefore, our goal is *not* to provide evidence of causal effects of starting a business on income development. Instead, we aim to offer visually clear and transparent stylized findings on selection into entrepreneurship, and income development and mobility of those who self-selected to become entrepreneurs.

We follow an event-study style approach to define the timeline and plot the income trajectories of both IE and UIE and wage earners. For entrepreneurs we define the year $t = 0$ as the year they start their new business and then follow their income development from five years prior to starting the firm to ten years after, i.e. between $t - 5$ and $t + 10$.

To obtain a similar timeline for wage earners, we randomly allocate a "pseudo-start year" ($t = 0$) for each wage earner using a uniform distribution over the time period covered in the data. Therefore, in year $t = 0$ the wage earners do not actually start a business, but this timeline allows us to describe the overall income trajectories of wage earners using a

similar timeline as for entrepreneurs. This approach provides us an intuitive benchmark for the general earnings growth in the economy, and allows us to describe both selection and income mobility in the distribution in a similar fashion for both new business owners and wage earners.

We contribute to the earlier literature by carefully considering the timeline of entrepreneurship. To our knowledge, our study is the first to follow new business owners long before and after they established their first business, enabling us to provide visually clear and tractable evidence on selection into entrepreneurship and the income development and mobility of business owners. As discussed above, we define individuals as entrepreneurs based on starting a new business, and then follow their income development before and after this event. In other words, our results are not conditional on firm success, as we follow these individuals regardless of whether they later on quit the business or the firm goes bankrupt. This approach allows us to analyze selection on actual new business creation, and how starting a new firm affects income development and mobility in the future. Previous literature often use smaller-scale surveys or cross-sectional data, which typically overweight business owners whose firms have survived for several years. Our analysis below further highlights the differences in the implications when using our approach and the methods often used in the previous literature.

Selection into entrepreneurship. We use the above timeline to study selection into entrepreneurship based on both individual and parental characteristics. We focus on a detailed analysis on how both individual and parental incomes before the firm was established are reflected in selection to establishing a new incorporated or unincorporated business.

Literature on the association between various personality traits and entrepreneurship has been recently summarized by Kerr et al. [2017]. They conclude that the evidence is currently mixed between various studies. However, some common personality traits have been found for entrepreneurs. For example, Levine and Rubinstein [2017] show that people who are both

smart and have illicit tendencies tend to be more likely to own an incorporated business, and succeed as an entrepreneur. On top of personality traits and characteristics, Levine and Rubinstein [2017] show that individual income is positively associated with becoming a business owner in the US. However, in addition to a general connection between income and being a business owner, there is lack of evidence on the more detailed connection between the two: is selection to entrepreneurship occurring throughout the income distribution, or only at the top?

Levine and Rubinstein [2020], for example, argue that high individual income can be associated with unobserved entrepreneurial abilities that are also valued at the labor market. This would suggest that particularly high income earners choose to start a business because they are more likely to benefit from being an entrepreneur instead of a wage earner. Relatedly, higher income can alleviate liquidity constraints by covering e.g. start-up costs and initial investments for the business (see e.g. Levine and Rubinstein 2020, Hurst and Lusardi 2004, Holtz-Eakin et al. 1994), increasing the likelihood of high-income individuals starting a business. We examine in great detail how income is associated with starting a new business, providing new insight on the link between individual earnings and entrepreneurship. If top income drives the selection into entrepreneurship, we expect to observe a significantly larger share of new entrepreneurs coming from the top of the income distribution compared to elsewhere in the distribution.

Also, previous literature documents that parental income and wealth and parental background in entrepreneurship increase the likelihood of becoming a business owner. For example, parental income and wealth are linked to starting a business (see e.g. Hurst and Lusardi 2004, Dunn and Holtz-Eakin 2000), and parental background in entrepreneurship is observed to be significantly associated with being a business owner (see e.g. Lindquist et al. 2015, Sorensen 2007, Uusitalo 2001, Dunn and Holtz-Eakin 2000). This literature suggests that the main channel behind the effect of parental background comes through human capital instead of liquidity. We focus on studying in detail the link between parental incomes and

new entrepreneurship. In addition, we study whether parental background in entrepreneurship affects this relationship. If parental background matters, we expect to see a positive relationship between parental incomes and parental entrepreneurship and the share of new business owners.

Income Development and Mobility. In addition to Levine and Rubinstein [2017] who show that the smart and illicit earn the most as incorporated entrepreneurs compared to others, Hurst and Pugsley [2011] and Hamilton [2000] highlight that a large number of (unincorporated) business owners do not make substantial earning gains and their income development often lack behind of regular wage earners. However, previous studies have not followed the income development of the entire population of new entrepreneurs over time long before and after they established their first business. In particular, there is lack of earlier evidence on how entrepreneurship affects income mobility across the distribution, both in terms of individual (pre-entrepreneurship) and parental income. Does entrepreneurship open a way for the individuals at the top of the distribution to become even richer, or does it provide a "Stairway to Heaven" for the less well-off individuals to reach top income levels? Our detailed data on new business owners and their parents allow us to fill this important gap in the literature.

First, to plot the income trajectories for each group, we estimate the following regression:

$$y_{ist} = \sum_{j \neq -1} \psi_j \times \mathbb{1}[j = t] + \sum_k \beta_k \times \mathbb{1}[k = s] + X_{is} + \epsilon_{ist}, \tag{1}$$

where y is log income for individual i in year s at event time t. We omit the event time dummy at $t - 1$ so that the estimated event time coefficients ψ_j represent the income development relative to the year just before the start of entrepreneurship. β_k represent year dummies flexibly controlling for the overall time trend. In addition to unconditional trajectories, we add various individual-level characteristics (X) to study how they affect longer-run

income development patters of business owners and wage earners. The controls include typical Mincer-type controls (level of education, years of experience and gender, and all their interactions and quadratic and cubic terms), and individual and parental percentile income ranks in $t - 1$.

To focus on income mobility, we zoom in on how the incomes of entrepreneurs starting at different parental and personal income rank positions in year $t - 1$ develop over time compared to wage earners starting at similar income levels. We do this by including rank decile dummies interacted with the event timeline in equation (1) for each group to analyze whether mobility outcomes differ across the position in the initial full distribution (including both wage earners and new entrepreneurs at event time $t - 1$). We follow the same approach for analyzing mobility by parental income ranks, and we also examine income mobility by interacting individual and parental ranks.

In addition, we analyze intergenerational mobility using rank-rank correlations – a well-established method in this field (see e.g. Chetty et al. 2014). Even though intergenerational mobility has been widely studied, there is lack of evidence for entrepreneurs.[8] This is surprising given that entrepreneurship is often viewed as a key channel for intergenerational mobility in the society (see e.g. Holtz-Eakin and Rosen 2003, Fairlie 2004).

Typically, the correlation between parents' and children's incomes are calculated using proxies for life-time earnings, which measure, for example, average annual incomes from a longer time period for both generations. We deviate from this approach and calculate the rank-rank correlations one year before and ten years after the new business was established. This allows us to examine whether potential differences in intergenerational mobility between entrepreneurs and wage earners are driven by selection into entrepreneurship or the entrepreneurship itself.

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[8]A recent working paper by Lindquist and Vladasel [2022] provide new evidence of intergenerational mobility of entrepreneurs in Sweden.

Firm Performance. Another important missing piece in the literature is the link between individual and parental background and firm performance. To our knowledge, our study is the first to go beyond individual outcomes by linking individual and parental backgrounds of new business owners with detailed data on their firms. Our paper thus provides novel evidence to the question of how individual and parental incomes are linked with firm success. This analysis also sheds more light on the question of how the rents from a successful business are shared within the society, and how these are correlated with individual and parental characteristics of the business owners.

Recent literature proposes that individual income is linked with entrepreneurial ability (Levine and Rubinstein 2020, Fairlie 1999), driven by the assumption that the skills rewarded at the labor market through higher wages are similar to those associated with the ability to run a successful business. In addition, liquidity could also affect the likelihood of becoming an entrepreneur (Levine and Rubinstein 2020, Hurst and Lusardi 2004, Holtz-Eakin et al. 1994), and the success of the business. Furthermore, earlier literature argues and underlines the role of parental background and the associated human capital channel in explaining entrepreneurial traits (see e.g. Dunn and Holtz-Eakin 2000, Hurst and Lusardi 2004, Hurst and Pugsley 2011, Lindquist et al. 2015), which could also impact the success of the business. While there is earlier evidence on how individual and parental incomes affects the likelihood of becoming an entrepreneur and the individual income development, our analysis using firm outcomes enables us to link these key background characteristics to the success of the new businesses directly.

We use equation (1) to study firm-level outcomes similarly as above, focusing on the first ten years of the business. We interact the event time coefficients ψ_j in equation (1) with individual or parental income rank deciles and their interactions to study differences in firm success by indvidual and parental background. We examine several important firm-level business activity measures. These include annual sales, number of employees and labor costs, value added, and value added per employee and R&D investments as measures

19

for productivity and innovativeness of the firms, and firm survival. Similarly as above for personal income gains, we focus on the development of these measures over ten years after the firm was established.

3   Selection into Entrepreneurship

Panel A of Table 1 presents the cross-sectional descriptive statistics for the full sample in 1997–2019. The table illustrates the common observations in the literature (see e.g. Halvarsson et al. 2018, Levine and Rubinstein 2017) that incorporated entrepreneurs (IE) earn on average much more (mean disposable income 31,097 euros and market income 40,348) compared to both wage earners (WE), 22,353 and 26,995, and unincorporated owners (UIE), 21,565 and 24,679 euros. Also, IEs are more likely to be men. They are also slightly more likely to be highly educated, married, have more children and live in the capital city region compared to WE and UIE.

In addition, there is clear difference in parental background between the groups. Similarly as in the previous literature (see e.g. Lindquist et al. 2015, Dunn and Holtz-Eakin 2000), Table 1 shows that both IE and UIE are much more likely to have one or two parents who were also entrepreneurs compared to WE (55%, 61% and 10%, respectively). However, parental income ranks are rather similar between the groups.

Panel B of Table 1 presents the same statistics for IEs and UIEs one year before they started their business $(t-1)$ and for WEs one year before the randomly allocated pseudo-start years. The table shows that those who select to become IE earn significantly more than WEs and UIEs already *before* they started their business (mean disposable incomes of 28,049, 20,596 and 17,371 euros, respectively). However, other observed characteristics except sex and parental entrepreneurship are rather similar between the groups, as in the full cross-sectional data.

We continue by zooming into the individual and parental income distributions to analyze

self-selection to starting a business in more detail in Figure 1. The upper panel in Figure 1 presents the average likelihood of starting a new IE and UIE by individual income rank percentiles one year before they started their business $(t-1)$. The figure shows that there is a clear non-monotonic association between becoming IE and the individual income rank percentile. Individuals located in the top 20% of the overall income distribution are much more likely to start an incorporated business compared to the rest of the distribution, where the likelihood of starting an incorporated business only weakly increases with income. The share of top income earners is even more striking the closer we zoom into the right tail: more than half of the starters are at the top earnings quartile a year before setting up their first firm, 17% come from the top 5%, and the top 1% spawns more than 5% of new business owners. In contrast, low income individuals are more likely to start an unincorporated business compared to the rest of the distribution, and there is a weak increase in this likelihood also at the very top. Altogether, Figure 1 highlights that there are clear differences in selection between the firm types, and in particular, high-income individuals are significantly more likely to start an incorporated business compared to the rest of the distribution. This evidence is well in line with the earlier literature highlighting the positive selection to IE by income and the distinction between firm types (see e.g. Lazear [2005]; Evans and Leighton [1989] and Levine and Rubinstein [2017]). Our granular analysis reveals that selection to incorporated entrepreneurship occurs non-linearly at the very top of the income distribution.

The lower panel of Figure 1 illustrates the correlation between parental income rank positions and the likelihood of becoming IE or UIE. In contrast to individual incomes, those at the top of the overall parental income distribution are not significantly more likely to start a business. On the contrary, Figure 1 shows that those with low-income parents are more likely to become either IE or UIE owners compared to those with high income parents. This relationship seem to be almost (negatively) linear, except for the very bottom of the parental income distribution, as the likelihood smoothly decreases for both groups when we move towards high-income families.

21

Interestingly, this observation differs from previous evidence from the US regarding inventors, who are documented to overwhelmingly come from high-income families (Bell et al. 2019), and from the patterns among incorporated business owners in the US and Sweden where it is observed that family income positively predicts the probability of owning an incorporated business (Levine and Rubinstein 2017, Lindquist and Vladasel 2022).

Likely reasons behind this discrepancy is that we focus on new entrepreneurs, who have no prior entrepreneurial experience, and we do not condition on firm survival. Previous literature often use survey or cross-sectional data that tend to overweight entrepreneurs whose firms succeeded. When using one-year cross-sectional data that includes all current business owners, we indeed do find an increase in the likelihood of being an incorporated entrepreneur at the top of the parental income distribution (see Figure A2 in Appendix A). These observations thus suggest that parental income is linked with survival of the business. Below in Figure 10, we show that firms with owners from higher-income families certainly are more likely to survive compared to those coming from lower-income families. This evidence contributes to the current understanding of entrepreneurial selection by highlighting that without any conditions on firm survival, there appears to be no positive connection between parental income and starting a new business, but there is a clear positive link between the top of the parental distribution and firm survival.

Next, we conduct a partial R-squared analysis to simultaneously explore the relevance of different factors explaining selection to starting an incorporated business, reported in Table 2. First, we find that parental background in entrepreneurship explains up to 70% of the overall explained variation in our model, meaning that this factor very significantly explains selection into entrepreneurship. Previous literature has long recognised that parental background in entrepreneurship clearly predicts whether an individual is him or herself also a business owner (see e.g. Dunn and Holtz-Eakin 2000, Uusitalo 2001, Sorensen 2007, Lindquist et al. 2015). Our observations clearly demonstrate the importance of intergenerational links in starting a business also in Finland. However, entrepreneurial background of parents does not explain

selection based on individual or parental incomes presented above. Even though incorporated entrepreneurs tend to earn much more than others on average, the individual and parental income rank distributions in $t-1$ are strikingly similar for both new entrepreneurs with and without entrepreneurial parents (see Figure A3 in Appendix A).

Second, Table 2 confirms that personal income rank in $t-1$ is very important for the selection into entrepreneurship (8.5%), and gender also stands out (5%) as most of the new IE are men (see Table 1). We also find that industry as an employee in $t-1$ plays an important role explaining selection (8.3%), and in particular individuals working in construction are more likely to set up an incorporated business (4%). In contrast, age or education do not significantly explain selection into entrepreneurship.[9]

To sum up, our evidence contributes to the existing evidence by explicitly and transparently illustrating self-selection into incorporated entrepreneurship at the very top of the distribution, and the negative relationship of the likelihood of starting a new business by parent income ranks. The positive relationship between individual income and the likelihood of starting a business for IE is similar to the correlation of individual wealth and starting a business documented in the previous literature by Hurst and Lusardi [2004]. However, one essential difference of our approach compared to the previous literature (see e.g. Levine and Rubinstein 2017, Lindquist and Vladasel 2022) is that we focus on new firms founded by individuals with no prior experience in running a business. In the previous literature, the timeline of entrepreneurship is very often ignored and thus the observed selection into entrepreneurship could be driven by the success of business, as those entrepreneurs who manage to survive are often overweighted in these samples. We instead do not condition on survival, and study the selection using pre-entrepreneur characteristics for all new entrepreneurs. This

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[9]We find that the owners of new incorporated businesses are seemingly older than one might perhaps first expect. Figure A4 in Appendix A illustrates that new IEs are typically between 30–40 year old (average 35) at the time they start their first business. This point regarding the old age of (successful) business owners has been raised already in the US context (Azoulay et al. 2020). In contrast, the largest share of new unincorporated firms are founded by individuals below 30 years of age.[10] The explanatory power of education in Table 2 is very small, meaning that levels of education does not predict starting a business, but incorporated entrepreneurs are more likely to have a degree from a technical field such as engineering (see Figure A5 in Appendix A).

difference in our approach also explains our finding of the negative relationship between the likelihood of starting a business and parent income ranks, an observation that clearly differs from the previous studies (Levine and Rubinstein 2017, Lindquist and Vladasel 2022).

4   Income Development and Mobility

4.1   Average Income Trajectories

Figure 2 plots the average annual development of disposable income with 95% confidence intervals from 5 years before to 10 years after the start of entrepreneurship using the approach described in equation (1). The income trajectories for all groups (IE, UIE, WE) are presented relative to year $t-1$, i.e. one year before starting the business and the randomly allocated pseudo-start years for wage earners.

First, panel A of Figure 2 shows the unconditional income trajectories and trajectories conditional on Mincer-type controls (all interactions of age, sex and education level, and the interactions using age squared and age cubed) that are typically applied in the literature (see e.g. Levine and Rubinstein 2017) for IE and WE. The first general finding from Panel A is that there is a clear difference between the income development of IE compared to WE. The unconditional income trajectory of IE is more steeply increasing already before the start of the business, echoing the selection into entrepreneurship based on individual income discussed above. Another interesting empirical fact is a clear dip in the income of IE entrepreneurs, approximately 8%, in the year the business is established ($t = 0$). This is likely stemming from the fact that it can take some time for a new corporation to be able to operate in its full capacity and for the owner to withdraw income from the newly founded firm. The individual incomes of IE then quickly catch up after this drop and increase even more rapidly in the years following the establishment of the business compared to wage earners. After ten years, entrepreneurs earn on average 25% more compared to wage earners, relative to the year before the firm was established.

Panel B shows that when including both Mincer controls and individual income rank controls at $t-1$ and parental rank controls, the trajectory for IE flattens both before and after the start of the business, such that the income development of IE and WE is now more similar to each other before $t=0$. This specification thus illustrates that after the more similar income development of IE and WE before $t=0$, the incomes of IE still increased more rapidly compared to both UIE and WE after the firm was established. However, the associated increase in disposable income for IE compared to WE after 10 years since the business was started reduces from approximately 25% to 15%. A cautionary implication of this finding is that cross-sectional comparisons and simple average income trajectories, even conditional on typically observed characteristics such as education and work experience, can easily lead to an overestimate on the associated average monetary gains of incorporated entrepreneurship if the selection on incomes is not accounted for.[11]

Panels C and D show similar graphs for UIE compared to WE. In contrast to IE, UIE tend to earn significantly less one year before they established their business, but then quite rapidly return to a similar stable income trajectory 1–2 years after the start of business. Panels C and D further illustrate that there are no significant long-run average income gains from unincorporated entrepreneurship compared to wage earners when reflecting the income trajectories 5 years before to ten years after the firm was established. Furthermore, comparing the results between the upper-panel and lower-panel of Figure 2 clearly highlight the difference between IE and UIE firm types in income development.

Similar types of stylized findings as above are well established for both IE and UIE in the recent literature from other countries and contexts, for example, using survey data from the US (Levine and Rubinstein 2017) and cross-sectional data from Sweden (Halvarsson

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[11]In euros, IE saw their disposable income increasing from 22,000 to 28,000 during the five years before the start of the business, and eventually to 41,000 ten years after becoming entrepreneurs, on average. For WE, the corresponding numbers are 17,000, 20,000 and 25,000 euros. Adding Mincer controls does not significantly change the overall picture compared to unconditional trajectories in Panel A, indicating that conditioning on age, sex and education does not significantly affect the comparative income development of incorporated entrepreneurs and wage earners. Furthermore, including additional covariates to the Mincer-style regression, such as industry, location, field of education or family characteristics, do not significantly affect the estimated trajectories we observe in Figure 2.

et al. 2018). Our analysis focusing explicitly on new business owners starting their first firm offers visually clear evidence of the income development of entrepreneurs compared to wage earners, extending the income trajectories from a longer time period before and after the firm was established. Using this approach, our findings emphasize that the incomes of IE are on a clearly increasing trend already before the business was established compared to both WE and UIE, reflecting self-selection into incorporated entrepreneurship by individual income.

Additionally, in Figure A6 in Appendix A we apply coarsened exact matching (CEM) as an attempt to more carefully balance the observed differences between WE and IE before the firm is established.[12] With CEM we are able to further narrow down the differences in the income trends between WE and IE before the firm was established, as can be expected. However, the overall implications remain mostly similar as in Panel B in Figure 2 above. Significant income gains from incorporated entrepreneurship are evident also when using the CEM approach as there is an approximately 20% difference between IE and WE ten years after the firm was established.

4.2 Income Gains by Individual and Parental Income Ranks

Next, we focus on describing income mobility patters across both the individual and parental income distributions. The above described average income trajectories described that incorporated entrepreneurs increased their earnings after establishing a business, but these general trends leave open the question of who actually gains from entrepreneurship. Figure 3 presents the changes in disposable income in percentages from one year before starting the business

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[12]In more detail, we use the average income rank deciles between $t-3$ and $t-1$, the growth in rank between $t-3$ and $t-1$, parental income rank, a dummy for parent being an entrepreneur, average share of labor earnings relative to total income in $t-3$ and $t-1$, and age, gender, the place of residence and the number of children at $t-1$ in the CEM weighting procedure to match the groups. For more details on the CEM method, see e.g. Iacus et al. [2012]. Furthermore, when applying the CEM method with such a rich set of variables used to balance the groups reduces the sample size considerably. Only 18% of the pseudo-starter wage earners and 62% of new incorporated entrepreneurs receive positive CEM-weights in the analysis, meaning that we cannot obtain a reasonable comparison using the other observations in the data. This finding further underlines the distinctive self-selection into entrepreneurship based on observed income development before the firm was established when comparing wage earners to incorporated entrepreneurs.

$(t-1)$ to ten years after $(t+10)$ for IE and WE within each decile of the overall individual income distribution derived at $t-1$, using the methods described in Section 2.3. The upper graph shows the percentage gains in each $t-1$ decile for IE and WE, and the bottom panel the difference in gains between these groups in each decile.

Figure 3 illustrates that the relative changes in income are larger for those coming from the bottom of the distribution for both IE and WE, and that IE earn on average more in each decile. The bottom graph highlights that the gains between IE and WE are rather evenly distributed across the distribution, and are between 20 and 30% in each decile. Therefore, even tough top earners are much more likely to start an incorporated business, the relative income gains are not larger at the top compared to the rest of the distribution. If anything, the gains somewhat decrease from the middle income brackets to the top.

Figure 4 shows similar graphs by parental income ranks. The upper graph shows that those with larger parental income earn on average more in both groups, but IE earn more than WE within each decile. The gains are again rather evenly distributed across the distribution, with the exception that IE from high-income families appear to gain more from entrepreneurship than the rest.

We also conduct a partial R-squared analysis to study the factors explaining income gains between $t-1$ and $t+10$ within IE and WE. These results are reported in Table 3. First, individual income rank percentiles are the most important predictor of income gains for both IE and WE (58% and 88% share of total R-squared, respectively). As percentile ranks capture the relatively high gains from lower income brackets and relatively low gains from higher income brackets, the partial R-squared is higher than what one would perhaps expect based on the fairly flat selection pattern in Figure 1.

Second, parental rank also seems to matter for the income gains, but only for IE and not WE. For incorporated entrepreneurs starting their business from high-income families have larger increases in income than those from low-income families. Third, despite the distinctive selection into incorporated entrepreneurship by those whose parents were also entrepreneurs,

the income gains of these owners do not appear to differ from those whose parents were not entrepreneurs. To further describe this finding, Figure A7 in Appendix A illustrates that the income trajectories are rather similar over time for incorporated entrepreneurs with or without parent(s) who have also been entrepreneurs. This illustrates that in contrast to the hypotheses of the importance of parental background, those with entrepreneurial parents appear to earn only slightly more as an entrepreneur compared to those with non-entrepreneurial parents.

Furthermore, those entrepreneurs who are still running their firms five years after the business was established have larger personal monetary gains, as shown in Figure A8 in Appendix A. However, those who do not make it past the first five years have similar levels of income as wage earners after 10 years the business was started. Instead, age, gender, and industry at $t - 1$ are not very strongly associated with income gains over time, while highly educated individuals seem to gain somewhat more from entrepreneurship compared to others (Table 3).

Next, we study the income gains by individual and parental ranks jointly. Figure 5 illustrates the changes in income between $t - 1$ and $t + 10$ for IE and WE in different individual income quintiles by parental income, that is, the first parental quintile (panel A), the third (panel B) and the fifth quintile (panel C). This granular break-down suggests that those who come from high-income families and were already at the top of the distribution gain slightly more from entrepreneurship. On the other hand, the smallest relative income gains are among top earners who come from low-income families. Overall though, the gains are rather evenly distributed around the average of some 20%.[13]

Furthermore, we plot income gains from entrepreneurship in *euros* in Figure A11, Appendix A. This analysis implies that well-off individuals who in relative terms gain slightly

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[13]In Figures A9 and A10, Appendix A, we show the entire disposable income trajectories from $t - 5$ to $t + 10$ for incorporated entrepreneurs and wage earners coming from different personal and parental income quintiles. These illustrations reveal that, in all bins, 1) the differences between to-be-entrepreneurs and wage earners are small before the transition to entrepreneurship, and 2) new business owners end up surpassing wage earners in 2–6 years.

more than the rest gain much more in absolute terms (euros). These comparisons rely on differences in annual disposable income between $t + 10$ and $t − 1$. For example, those individuals who come from the top quintile in terms of both individual and parental income distributions gain nearly 35,000 EUR in comparison to comparable wage earners, whereas for the rest of the sample, the gain is approximately 15,000 EUR on average.[14]

Finally, we analyze intergenerational mobility by examining rank-rank correlations between parents and their children. As discussed in Section 2.2, we define the parental income ranks using a distribution of average annual household income of parents when they were 45–50 year old. We measure children's income at two fixed points in time, similarly as in our analysis above: one year before and ten years after the entrepreneurs started their first business, and for wage earners relative to the randomly assigned random pseudo-start year.

The results for the rank-rank correlations are presented in Figure 6. First, we find that the rank-rank correlation of wage earners and their parents is between 0.14 and 0.21, depending on when the children's income is observed ($t − 1$ or $t + 10$). These numbers align with the earlier intergenerational mobility studies conducted using Finnish data (0.14 in Kaila et al. 2021) and those obtained for Denmark (0.18 in Chetty et al. 2014). This supports the general validity of our rank-rank measure.[15]

Among incorporated entrepreneurs the rank-rank correlation is between 0.06 and 0.09, less than half of that for regular wage earners. The ratio between the correlations of incorporated entrepreneurs and wage earners remains stable at around 0.4 in both fixed time points $t − 1$ and $t + 10$. Thus, drawing a conclusion that entrepreneurship fosters intergenerational income mobility would be biased by the fact that entrepreneurs were more mobile already before establishing their first business. This implies that large intergenerational mobility among entrepreneurs is driven by self-selection to starting a business. Lindquist and Vladasel [2022]

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[14]The full trajectories in euros are presented in Figures A12 and A13.

[15]The intergenerational mobility literature often measures the rank-rank correlations using proxies for life-time earnings, which measure, for example, average annual incomes from a longer time period for both parents and their children (see e.g. Chetty et al. 2014, Lindquist and Vladasel 2022, Kaila et al. 2021). We depart from this approach and define the earnings of children in two points in time to highlight the potential impact of selection into entrepreneurship.

document a similar result using Swedish data. Unincorporated entrepreneurs fall between the two others groups, and their rank-rank correlation is in the range of 0.11–0.18.

5   Firm Performance

Evidence described above suggested that the owner-level gains from entrepreneurship are fairly evenly distributed across individual and parental income distributions. Next we focus on describing how important are individual and parental characteristics on firm performance by examining firm-level outcomes over the first ten years for IE business owners with different individual and parental incomes, similarly as above for personal incomes.

Figure 7 presents the average ten year log turnover, employment, labor costs, value added (sales-costs), productivity (value added per worker) and the likelihood of R&D investments by firms with main owners in different income deciles in $t-1$, and by parental rank deciles. The main finding from Figure 7 is that key firm-level outcomes appear to be increasing in individual income of the main owner (solid markers). Firms with owners who had higher incomes before the firm was established tend to fare better and grow faster compared to firms whose main owner had smaller earnings. As an illustration of the magnitudes, the difference in turnover between businesses founded by top and bottom decile earners is 64% (Panel A of Figure 7). For number of employees, staff costs, value added and productivity, the differences are 43%, 68%, 66% and 33%, respectively. This indicates that the differences are largest in turnover, in value added and at the intensive margin of employment. The only exception in Figure 7 is R&D: the pattern in Panel F suggests a U shape of innovation by income ranks so that the least innovative firms are those with middle income owners.

Firm-level outcomes seem to be rather evenly distributed across the parental income distribution, as shown by the hollow markers in Figure 7. This suggests that parental income does not significantly predict the success of the business itself, even though the entrepreneurs from high-income families had moderately larger individual income gains. This means that

firms founded by individuals from well-off families are not better. However, there is one exceptions to this pattern: new business owners from high-income families are much more likely to invest in R&D.

The observed association between individual income and firm success align with the hypothesis that individual earnings are closely associated with entrepreneurial ability and the success of the business (Levine and Rubinstein 2020) when measured with firm-level outcomes. In addition to ability, income ranks can be associated with liquidity, as high-income individuals are more likely able to invest more capital into their firms compared to low-income individuals. Or alternatively, they can have better networks that give these individuals a better chance of raising money from external investors. Higher initial capital stock could in turn positively impact business outcomes in the future. This type of channel has been emphasized in the recent literature evaluating the impacts of various business taxes, which shows that an increase in firm liquidity after business tax reforms is essential in explaining firm investments and growth (see e.g. Boissel and Matray 2022, Harju et al. 2022, Love 2022).

Indeed, we do find that high income owners have a higher initial capital stock in their firms, as illustrated in Panel A of Figure 8. Therefore, part of the associations reported above in Figure 7 could be explained by liquidity and assets of the firm instead of the ability of owner being linked with individual earnings.

One potential explanation for the lack of a robust positive association between parental income and firm success may also lie in liquidity constraints. Panel B of Figure 8 shows that initial capital stock is not increasing by parental income, in contrast to the clear positive association with individual income ranks. Therefore, contrary to a common belief, parental incomes are not linked with larger capital installments in the firm, which could in turn play an important role for the success of the business.

We also evaluate how individual and parental incomes jointly predict the success of new businesses. By large, Figure 9 shows that key firm-level outcomes are increasing in

individual income even when conditioning on parental income. The positive association between personal income and firm success is the most pronounced among those who come from low-income families when we examine turnover, value added and productivity, Panels A, D and E of Figure 9, respectively.

One important additional measure for the success of the business is the survival rate. Panel A of Figure 10 shows that businesses established by top earners face a far smaller likelihood of being bankrupt during the first ten years of businesses' life span. This likelihood does not decrease monotonically by individual income meaning that the bottom earners do not establish firms that have the highest chance of being bankrupt early on. Panel B, however, shows that the bottom earners have the highest chance of losing the majority owner status. Panel C shows that the bankruptcy rates are quite similar between the bottom 90% of the parental income distribution. Instead, firms founded by those who come from the top 10% families face a smaller likelihood of bankruptcy. Panel D shows that survival rates vary only little by parental incomes. Overall, owners with the highest individual or parental ranks have clearly the highest survival rates. Interestingly, survival rates in Panels C and D of Figure 10 show that that these firms indeed are less likely to go bankrupt, but our earlier evidence in Figure 7 suggested that firms founded by entrepreneurs coming from well-off families are not on average better compared to entrepreneurs striving from lower income families, conditional on surviving.[16]

Finally, Figure A15 in Appendix A demonstrates that the upward-sloping pattern between firm success and individual income holds when we account for parental background in entrepreneurship. These findings indicate that despite its significance in predicting who becomes a new business owner, parental background in entrepreneurship is not tightly asso-

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[16]Figure A14 in Appendix A shows that the development of firm-level outcomes is strongly correlated with personal-level income *development*. The owners of the top 10% firms by any of our measure saw their personal income increase by 75-100% from $t-1$ to $t+10$. However, the relationship is non-monotonic as the owners of the smallest firms measured with employment and sales saw higher gains than the owners of the firms that are ranked at the second-lowest or third-lowest decile. Nonetheless, the overall finding is clear and intuitive: personal-level gains go hand in hand with firm-level development such as turnover, value added and number of employees.

ciated with firm-level outcomes. This is perhaps surprising in the light of previous literature that underlines the key role of human capital stemming from the entrepreneurial traits of parents (Dunn and Holtz-Eakin 2000, Hurst and Lusardi 2004, Hurst and Pugsley 2011, Lindquist et al. 2015).

6   Entrepreneurs at the Top of the Income Distribution

Above we presented that individuals at the top of the distribution are distinctively more likely to establish a new incorporated business, and that they gain significantly more earnings compared to wage earners after starting the business. This opens the question of what is the role of selection versus the income gains from entrepreneurship in explaining why business owners tend to govern the top of the income distribution in many developed countries (Smith et al. 2019, Halvarsson et al. 2018, Piketty et al. 2017).

To characterize the role of selection and income gains, we first focus on the top half of the income distribution and describe the share of incorporated business owners at the top of the distribution before and after the firm is established. Figure 11 presents income ranks for IE owners one year before $(t-1)$ and ten years after $(t+10)$ the firm was established, and income ranks for all incorporated entrepreneurs, not just the new, in the full population of Finnish individuals over 16 years of age. The figure shows that roughly 3% of incorporated entrepreneurs were among the top 1% earners already in the year before they established their first business.[17] Ten years after their share is increased to 10.7%. At top 10% the corresponding shares before and after starting the firm are 17% and 36%. Therefore, consistent with our findings on selection and income development, new entrepreneurs appear to govern the top of the distribution even before starting a business. However, their prevalence at the top is clearly enhanced by the positive average income gains associated with incorporated

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[17]In order to analyze the distribution without changes in the composition of the samples, the distributions in Figure A2 include those individuals who are observed both at $t-1$ and $t+10$, whereas Figure 1 includes all new incorporated entrepreneurs irrespective of whether we observe them throughout the full ten years. This restrictions slightly reduces the the share of incorporated entrepreneurs at the top 1%.

entrepreneurship throughout the distribution. Moreover, the prevalence of *new* incorporated business owners at the top of the distribution ten years after they established their first firms closely resemblances the share of *all* incorporated entrepreneurs at the top. This gives further evidence that the length of our event study timeline is sufficiently long to capture the over-representation of entrepreneurs at the top of the distribution in the entire population.

To support these findings, Figure 12 presents the likelihood of reaching the top of the distribution in year $t+10$ for both IE and WE, conditional on locating in different percentile points in the distribution in year $t-1$. This analysis relies solely on our event study sample. The figure shows that the likelihood of reaching both top 1% and 10% are larger for IE compared to WE throughout the distribution. This suggests that IE are more likely to significantly increase their earnings compared to WE regardless of where in the distribution they were before starting their business. In contrast, the bottom graph in Figure 12 illustrates that the likelihood of locating at the bottom 50% of the distribution is rather similar between entrepreneurs and wage earners. This shows that entrepreneurship is associated with more significant income gains but not with more significant income losses. This is consistent with the findings that in addition to significant selection by incomes, incorporated entrepreneurs increase their relative share at the top of the distribution through larger income gains from the business, compared to wage earners.

Next, we focus even more on the top of the income distribution by studying the composition and income sources at the top percentiles. In this analysis, we focus on market income to be able to better distinguish between different factor income sources and we also examine the entire Finnish population (over the age of 16). We first plot the share of wage earners, incorporated and unincorporated entrepreneurs at the top 1% of all income earners in 2006–2016 in Figure 13. The top panel of the figure shows the raw shares of these groups in the top 1%. The share of incorporated owners in top 1% of the distribution is approximately 35-40%, wage earners 45-50%, and unincorporated entrepreneurs 10-20%, depending on the year. The lower panel weights these shares by the prevalence of these groups in the whole

population and illustrates that incorporated entrepreneurs are governing the top 1% by a factor of almost 20 in comparison to their share in the population.

Our second line of inquiry involves evaluating the share of business income of all income earned across the top 10% of income distribution, following the work by Smith et al. [2019] for the US. Figure 14 shows that from the 90th to the 99th percentile of the overall income distribution, wage income clearly dominates as an income source. For example, at the 90th percentile approximately 90% of the aggregate income comprises of wage income. The share of non-wage income (business income + other capital income) gradually increases the closer we approach the very top of the income distribution, and this share increases very sharply when we move to the richest 0.1%, where wage income falls below 40% of aggregate income, and non-wage income represents more than 60% of total income.

Our results provide very similar evidence as was presented for the US by Smith et al. [2019]. Despite the clear differences in the institutional settings and the tax systems for business owners, business income and other capital income clearly dominate the very top of the distribution in both of these countries. Perhaps surprisingly, the share of non-wage income is even larger at the top 0.1% in Finland compared to the US.

7   Additional Analysis

7.1   Market Income and Retained Earnings

Focusing on market income instead of disposable income, used in our baseline analysis, does not significantly affect other qualitative aspects of our analysis.[18]   Again, the gains from entrepreneurship are rather evenly distributed across individual and parental income ranks, as illustrated in Figure A18 in Appendix A. The most apparent change compared to disposable income patterns is that those who come from low-income families and had low

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[18]Market income includes the following income sources: wages, entrepreneurial income and capital income, which is the sum of dividends, interest income, private pensions, rental income on properties, taxable capital gains and other capital income.

incomes as wage earner are outpaced by those who do not start a business, see Figure 5. Also, those who come from high-income families and were already at the top of the distribution, do not see larger gains from entrepreneurship. This hints that the Finnish tax system benefits those who start their firm from top incomes – we investigate this in more detail below in Section 7.2.

Defining an exact boundary between firm's financials and owner's incomes can be very challenging (see e.g. Kopczuk and Zwick 2020). In addition to income withdrawn from the firm as wages, dividends and capital gains, the owners of privately held businesses can retain earnings in their firm. However, these retained earnings do not show up as income for individual owners in the administrative data in the year that they are accrued.[19]

In order to analyze how retained earnings might affect our analysis, we follow a similar type of approach as in Alstadsæter et al. [2016] and allocate them to each owner firm based on their ownership share of the firm on top of the market income observed in the administrative data. In addition, we use an alternative measure of retained earnings where we subtract annual investments in machinery and equipment from the observed total firm-level retained earnings. This measure thus includes only the incomes that are retained in the firm but not used directly to fund investments in physical capital.[20]

Figure A17 in Appendix A shows the income development for IE and WE when accounting for earnings retained in the firm.[21] Dividing earnings retained in the firm to each individual IE and including them on top of market income appears to increase the income

[19]For example, the incomes retained in the firm might show up in the reported individual income of the owner only after a long time period in a very lumpy fashion, making it difficult to derive a consistent income trajectory for entrepreneurs. Second, some of the income retained in the firm can be used for private consumption of the owner without never showing up in the individual-level administrative data.

[20]Similarly as in the Norwegian institutional setting studied by Alstadsæter et al. [2016], the Finnish dividend tax system also creates incentives for incorporated owners to accumulate earnings into their firm. This is due to the fact that firm-level net assets (assets - debts) affect the owner-level dividend income tax rates such that a larger net assets position reduces the dividend tax rate of the owner, as described in more detail in Appendix B. Therefore, retained earnings are particularly important to take into account as a potential income source for incorporated business owners in the Finnish context.

[21]As retained earnings are not relevant for UIE in the Finnish context (all of the firm income is taxed each year at the individual level for UIE), Figure A17 only concentrates on comparing the income trajectories of IE and WE over time.

levels of IE by an almost constant annual share of 15%, starting right from the first year after the business was established. This additional income is evenly distributed across individual and parental income distributions, see A19 in Appendix A.

The inclusion of retained earnings has a big impact on the composition of income at the top of the distribution when we look at the entire population. Figure A20 in Appendix A shows that when including retained earnings to the market income measure further increases the share of non-wage income at the very top from 60% to almost 80%. This highlights the role of retained firm assets at the very top also in the Finnish context, in addition to other recent evidence from the US (Piketty et al. 2017, Kopczuk and Zwick 2020), Norway (Alstadsæter et al. 2016) and the Netherlands (van Essen et al. 2022).

To further examine retained earnings and top-end inequality, in Figure A21 we show the top 1% market income shares with and without retained earnings in 2006–2018. Top 1% earns from 10% to 12% of all income in Finland, depending on the year. When we include retained earnings divided to each incorporated business owner to the market income measure, the share increases to 12-16%. Evidently, the income shares at the very top are rather cyclical as the start of financial crisis in 2008 decreases the income shares of these individuals and when approaching the end of our sample period the top 1% income share increase again to resemble those in pre-crisis years.

7.2   Income Taxes

The income gains from entrepreneurship are qualitatively very similar across disposable and market income, as discussed in Sections 4.1 and 4.2. However, the magnitudes are somewhat different. On average, ten years after incorporated entrepreneurs established their first firm, they have 21.3% higher annual disposable income than wage earners, but market income gain is smaller, 17.6%. This demonstrates the features of the Finnish dual income tax system, where the earned income tax rate schedule is more progressive with the top tax rate of approximately 55%, whereas the top tax rate for capital income is 34%, see more detailed

description of the tax system in Appendix B.

To analyze the role of taxation, we plot the average tax rates (paid taxes / market income) for IE, UIE and WE by market income ranks in year $t-1$ and $t+10$ in Appendix A Figure A22, respectively. As the divergence in tax rates between entrepreneurs and wage earners potentially occurs at the top of the income distribution, we highlight the patterns within the top decile of the individual market income distribution. Panel C of the figure shows that for wage earners the average tax rates clearly increase from year $t-1$ to $t+10$ by all income ranks. For unincorporated entrepreneurs (Panel B) there are no large changes in average tax rates across income ranks. However, for incorporated entrepreneurs the largest average tax rate increase is among income ranks below or equal to 90, and otherwise, the changes are small until 97th rank, and finally at the very top average tax rates even decrease. This is interesting given our earlier evidence that illustrated a clear income gains for these entrepreneurs.

7.3   Sensitivity to Estimation Sample

We described above that a parent being an entrepreneur is not driving the differences in the gains from entrepreneurship (Figure A7). In Table 3, we also systematically evaluated the relative importance of various observable characteristics, and highlighted that the gains are not driven by individual industry, age or gender. Highly educated individuals, however, seem to gain slightly more from entrepreneurship.

Appendix A Table A2 summarizes the average increase in disposable income among incorporated entrepreneurs from one year before becoming an entrepreneur to ten years after using different subsamples. First, the gains from entrepreneurship are somewhat larger among those, who were wage earners before establishing their first incorporated business, than among those, who were unincorporated entrepreneurs. Second, we again verify that a parent being an entrepreneur is not driving the differences in gains. Third, we show that those, who remained as entrepreneurs for five years, gained almost a third more than those

who did not.

The three bottom elements of Table A2 illustrate two things. First, the gains are larger among those who started as entrepreneurs in 1998–2005. This coincides with the aggregate growth of the Finnish economy. In 1998–2005, the annual growth rate of GDP was 3.6% on average, while in 2006–2014, growth was only 0.6%. Second, to identify those who started in 1998–2005, we need to rely on data from the Tax Administration for those owners who received dividend income from their firm (dividend-based). For 2006–2014, we have the full Finnish Longitudinal Owner-Employer-Employee Data from Statistics Finland (FLOWN-based). Thus, it is possible that the differences in gains over time are driven by our definition of incorporated entrepreneurs. Reassuringly, we get nearly identical results for 2006–2014 starters between dividend-based and FLOWN-based definitions.

We also investigate how the gains from entrepreneurship differ between industries of the newly established firms, Figure A23 in Appendix A. We see notable differences. The largest gains accrue to those individuals who set up their first in the legal and accounting services industry. Meanwhile, the lowest gains are for those who start in construction. Looking at average annual disposable income ten years after the businesses were established, the difference between the two is about 35%.

Figure A24 shows the disposable income trajectories separately for our baseline sample (Panel A) and for individuals that are observed throughout from $t-1$ to $t+10$ (B) and from $t-5$ to $t+10$ (C). The gains from entrepreneurship are notably higher in these balanced panels of individuals. This reflects two things. First, keeping only individuals who are in our sample through the ten first years of entrepreneurship places a heavier weight on younger individuals who obviously have higher income trajectories compared to older individuals. Second, this also places more weight on individuals starting their businesses during better macroeconomic conditions, pre-financial crisis, which is also line with the evidence provided in the three bottom elements of Table A2.

8 Conclusions

In this paper, we provide comprehensive evidence on selection into entrepreneurship and both intra- and intergenerational mobility of business owners, and their implications to top-end inequality. Furthermore, we link individual and parental characteristics with detailed firm-level data and study which owner-level characteristics drive firm success. We provide three main findings which we present below.

First, we observe distinctive selection into incorporated entrepreneurship at the very top of the individual income distribution, but no similar selection by parental income or many other observable individual-level characteristics such as age, industry, occupation or education. However, parental background in entrepreneurship is a clear predictor for a child starting a new business.

Second, we find that incorporated entrepreneurship is associated with positive income gains compared to both unincorporated business owners and wage earners. Following individuals over time before and after the transition to entrepreneurship reveals that establishing their first business boosts the incomes of individuals who were already on a steep trajectory. The gains from entrepreneurship are rather evenly distributed across both individual and parental income distributions, but, if anything, the relative gain somewhat decreases at the top. However, the relative gains from entrepreneurship are largest for individuals with two conditions: individuals who are high-income earners to begin with and who come from high-income families. We also show the extent to which entrepreneurs govern the top of the income distribution, and the strikingly large role of business income at the very top.

Third, we go beyond individual outcomes by linking individual and parental backgrounds of new business owners with detailed data on their firms and show that both the scale (sales, employment) and productivity (value added, R&D investments) of newly established firms are increasing in individual income before starting a business. This means that the firms founded by top income earners appear to be, on average, more productive and successful compared to those owned by middle or low-income earners. This provides an interesting

insight, high-income incorporated business owners do not appear to benefit in relative personal income gains compared to lower income owners, but the firms they establish are much higher quality.

These findings provide new evidence to the discussion on selection into starting a business and the role of entrepreneurship as a vehicle for income mobility. In addition to the findings on various personality traits (Levine and Rubinstein 2017, Kerr et al. 2017), our evidence underlines individual incomes as a key source of selection. In line with many previous studies (Levine and Rubinstein 2017, Halvarsson et al. 2018), we find a positive association between entrepreneurship and average income development. The gains are visible across both individual and parental income distributions. However, when taking into account self-selection into entrepreneurship by income, entrepreneurship does not seem to offer a particular "Stairway to Heaven" for those who come from a less privileged background as the largest relative income gains are among for already high-income individuals coming from well-off families. However, interestingly, individuals with high income to start with also tend to establish better firms. We find that this finding partly stems from liquidity and assets, in addition to individual ability (Levine and Rubinstein 2020). Moreover, the businesses of these high-income (high-asset) owners appear to have positive spillovers to the population of wage earners in terms of job creation and value added.

Finally, while entrepreneurs typically populate the top of the income distribution in many countries (Smith et al. 2019, Kopczuk and Zwick 2020), our analysis underlines that a notable part of this phenomenon can be allotted to selection into entrepreneurship. Our analysis suggests that many top-income entrepreneurs would have been high-income earners even if they had not started a business and continued as wage earners. This highlights the important role of self-selection into entrepreneurship. Nevertheless, gains from entrepreneurship somewhat increase top-end inequality by making rich even richer, but importantly, their high-quality businesses create greater value for others in the lower parts of the income distribution. Therefore, our results provide ambiguous conclusion since the costs of rising income inequality has

a counterpart, higher firm growth rates among high-income individuals starting businesses.

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Tables and Figures

Table 1: Descriptive statistics

	All	Wage earners	Entrepreneurs All	Unincorporated	Incorporated
Panel A: Full sample, 1997-2019					
Observations	9,214,232	7,994,448	1,219,784	866,905	403,565
Share of observations	100 %	86.5 %	13.5 %	9.6 %	4.5 %
Disposable income	22,637	22,353	24,455	21,565	31,097
Disposable income rank	51	52	50	45	61
Market income	27,313	26,995	29,393	24,679	40,348
Market income rank	51	51	49	44	61
Parent rank	35	34	37	36	40
Parent entrepreneur	0.16	0.10	0.58	0.61	0.55
Age	37	37	36	36	37
Female	0.48	0.51	0.33	0.37	0.24
Secondary education or higher	0.42	0.44	0.34	0.30	0.42
Tertiary education or higher	0.28	0.28	0.23	0.20	0.30
Capital region	0.22	0.22	0.23	0.22	0.25
Married	0.47	0.47	0.48	0.46	0.54
Number of children	1.13	1.11	1.21	1.18	1.29
Panel B: Sample at t-1, 1997-2013					
Observations	659,446	569,044	90,402	61,876	28,707
Share of observations	100 %	86.0 %	14.0 %	9.5 %	4.5 %
Disposable income	20,619	20,596	20,765	17,371	28,049
Disposable income rank	49	50	43	36	59
Market income	24,424	24,499	23,954	18,081	36,623
Market income rank	49	50	43	35	59
Parent rank	35	34	37	36	40
Parent entrepreneur	0.16	0.10	0.58	0.61	0.55
Age	34	34	34	33	35
Female	0.49	0.51	0.33	0.38	0.25
Secondary education or higher	0.41	0.43	0.34	0.30	0.43
Tertiary education or higher	0.27	0.27	0.23	0.20	0.30
Capital region	0.23	0.23	0.23	0.23	0.25
Married	0.43	0.42	0.45	0.42	0.51
Number of children	1.06	1.04	1.16	1.12	1.25

Notes: Table presents the descriptive statistics for all individuals, wage earners and owners of unincorporated and incorporated businesses. Table shows the mean values for each variable. Panel A presents the statistics for the full sample in 1997–2018, including all wage earners and business owners. Panel B describes the sample in year $t-1$, one year before the business was established and one year before the randomly allocated pseudo-starts for wage earners for the years 1998–2013. This sample includes the main owners of businesses, and is limited to the year 2013 as we follow each individual for a minimum of five years. Secondary education includes high school and vocational education. Tertiary education includes bachelor or a higher degree. Capital city region includes Helsinki, Espoo, Vantaa and Kauniainen.

Table 2: Probability to start an incorporated business by observable characteristics: Partial R-squared analysis

	Partial coeff.	Partial coeff.^{2}	Share of total R^2
Parent entrepreneur	0.3001	0.0901	71.07 %
Industry as an employee in $t-1$			
Manufacturing	-0.0463	0.0021	1.69 %
Construction	0.0709	0.0050	3.97 %
Wholesale and retail trade	0.0319	0.0010	0.80 %
Restaurants and accommodation	0.0214	0.0005	0.36 %
Finance and insurance	-0.0155	0.0002	0.19 %
Legal and accounting services	0.0170	0.0003	0.23 %
Management consulting	0.0319	0.0010	0.80 %
Architectural and engineering services	0.0184	0.0003	0.27 %
Health services	0.0016	0.0000	0.00 %
Total		0.0105	8.31 %
Age at $t-1$	0.0288	0.0008	0.65 %
Age^2	-0.0264	0.0007	0.55 %
Education			
Secondary	-0.0080	0.0001	0.05 %
Tertiary or higher	-0.0089	0.0001	0.06 %
Education unknown	0.0166	0.0003	0.22 %
Female	-0.0795	0.0063	4.99 %
Individual rank at $t-1$	0.4246	0.0108	8.50 %
Parental rank	-0.2506	0.0071	5.59 %
Total R^2		0.1267	100 %

Notes: Table presents the estimates of the proportion of the variance of the probability to start an incorporated business that is explained by each predictor. The estimates are based on a sample of those individuals who establish an incorporated business and those who never engage in any business activities.

Table 3: Monetary gain from $t-1$ to $t+10$ by observable characteristics: Partial R-squared analysis

	Incorporated entrepreneurs			Wage earners (pseudo-starters)		
	Partial coeff.	Partial coeff.^{2}	Share of total R^2	Partial coeff.	Partial coeff.^{2}	Share of total R^2
Parent entrepreneur	0.0349	0.0012	0.77 %	-0.0223	0.0005	0.19 %
Industry as an employee in $t-1$						
Manufacturing	-0.0215	0.0005	0.29 %	-0.0432	0.0019	0.70 %
Construction	-0.0463	0.0021	1.36 %	-0.0233	0.0005	0.20 %
Wholesale and retail trade	-0.0170	0.0003	0.18 %	-0.0302	0.0009	0.34 %
Restaurants and accommodation	-0.0229	0.0005	0.33 %	-0.0214	0.0005	0.17 %
Finance and insurance	0.0055	0.0000	0.02 %	0.0128	0.0002	0.06 %
Legal and accounting services	0.0074	0.0001	0.03 %	-0.0010	0.0000	0.00 %
Management consulting	0.0013	0.0000	0.00 %	0.0034	0.0000	0.00 %
Architecture and engineering	0.0014	0.0000	0.00 %	-0.0138	0.0002	0.07 %
Health services	0.0089	0.0001	0.05 %	-0.0321	0.0010	0.39 %
Total		0.0036	2.27 %		0.0052	1.93 %
Age at $t-1$	-0.0151	0.0002	0.14 %	-0.0154	0.0002	0.09 %
Age^2	0.0039	0.0000	0.01 %	-0.0040	0.0000	0.01 %
Education						
Secondary	0.0475	0.0023	1.43 %	0.0746	0.0056	2.07 %
Tertiary or higher	0.1185	0.0140	8.89 %	0.1043	0.0109	4.06 %
Education unknown	-0.0289	0.0008	0.53 %	-0.0405	0.0016	0.61 %
Female	-0.0639	0.0041	2.59 %	-0.0744	0.0055	2.07 %
Individual rank at $t-1$	1.0338	0.0915	57.89 %	1.5819	0.2369	88.41 %
Parental rank	1.8613	0.0403	25.47 %	0.3107	0.0015	0.56 %
Total R^2		0.1580	100 %		0.2679	100 %

Notes: Table presents the estimates of the proportion of the variance of the increase in disposable income from $t-1$ to $t+10$ that is explained by each predictor. For incorporated entrepreneurs, $t=0$ indicates the year when their first business was established. For wage earners, $t=0$ represents the randomly allocated pseudo-start. The estimates are based on analyzing incorporated entrepreneurs and wage earners separately.

Figure 1: Share of new entrepreneurs by individual and parental income ranks
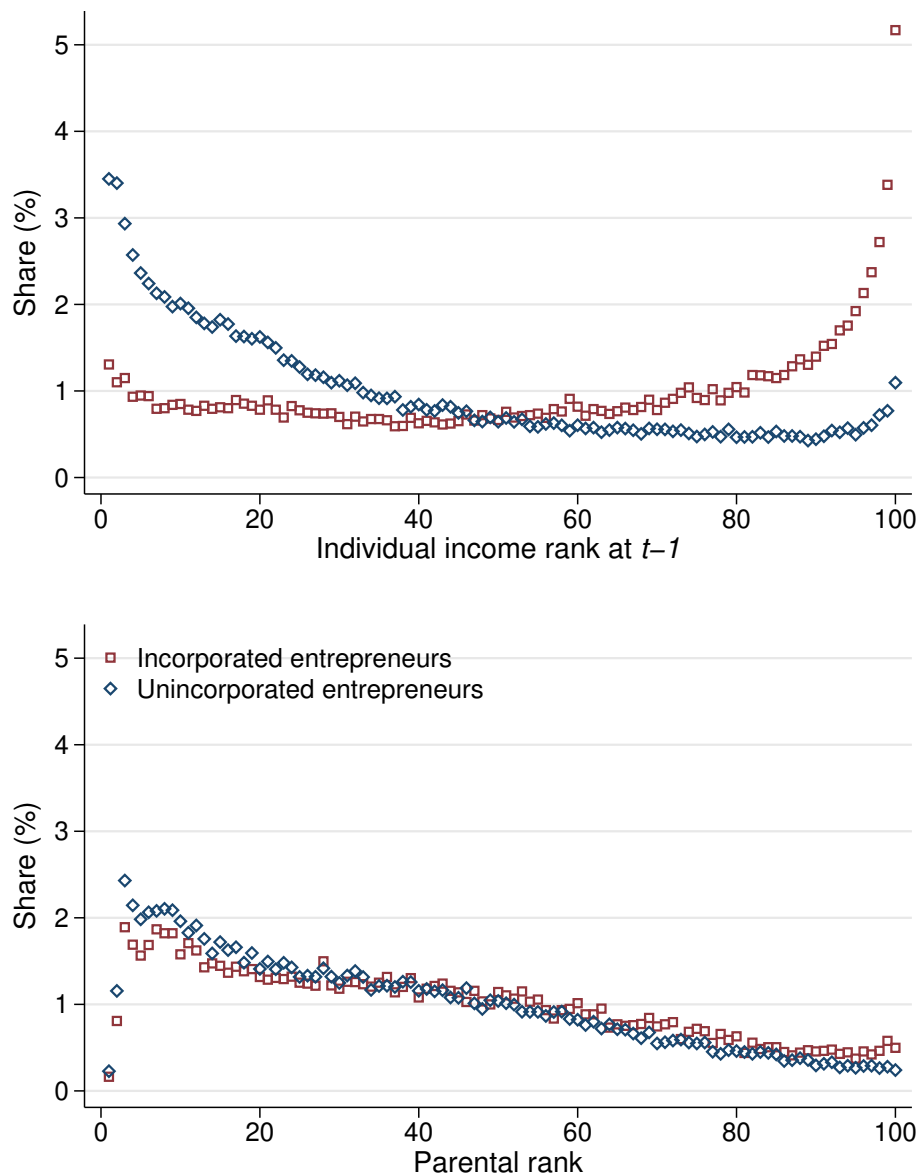
Notes: Figure presents the percentage shares of new incorporated (red squares) and unincorporated (blue diamonds) business owners by their individual income ranks one year before establishing the business ($t-1$) and by their parental income ranks. Individual income ranks are calculated from the distribution of disposable income in $t-1$ including all individuals in our baseline sample. Parental income is calculated as average annual household income when the parents were 45–50 year old.

Figure 2: Average disposable income trajectories
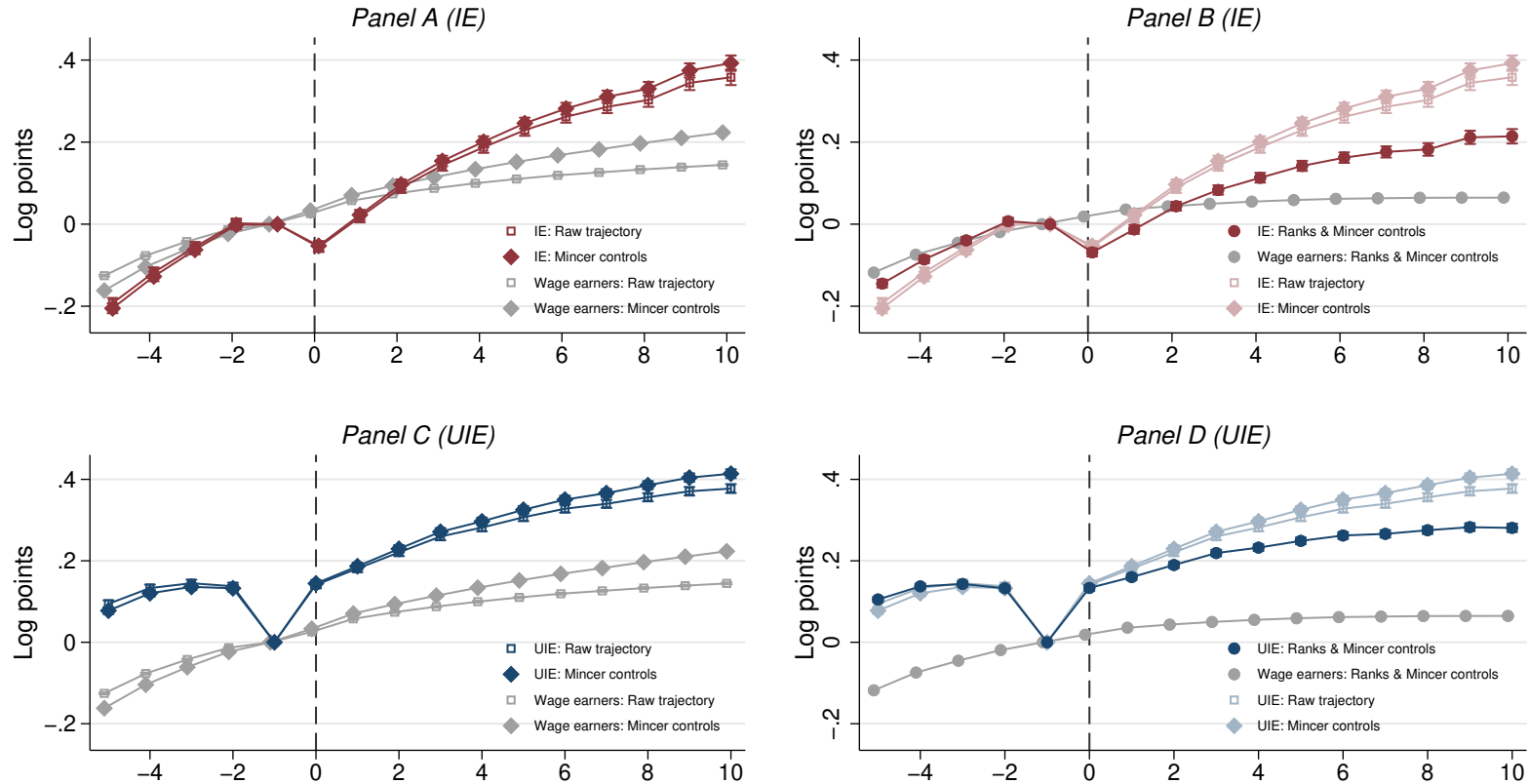
Notes: The figure presents the disposable income trajectories of business owners (unincorporated and incorporated) and wage earners before and after the business was established ($t = 0$), relative to the year $t - 1$ (denoted by zero in the figure). For wage earners, pseudo-starts are drawn from a uniform distribution. The Mincer-style controls include all interactions of age, sex and education (primary education, secondary degree or tertiary degree) and the interactions using age squared and age cubed. Individual income ranks are measured at $t - 1$ from the full distribution including both wage earners and business owners in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old.

Figure 3: Gains in disposable income by individual ranks
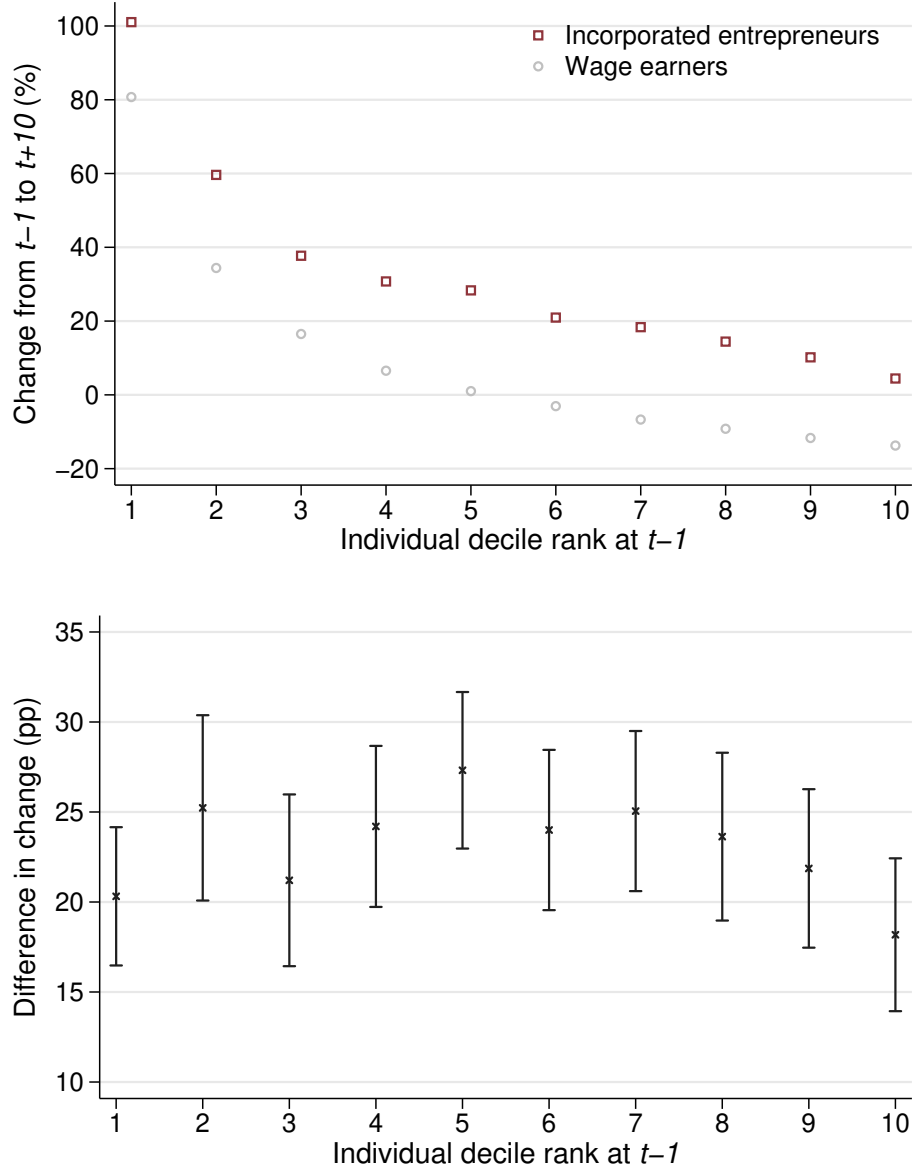
Notes: The figure shows the monetary gains in disposable income from incorporated entrepreneurship in percentages compared to wage earners by individual income rank deciles. The top panel presents the gains by group and the lower panel the difference between entrepreneurs and wage earners. We define *Gain* as the log difference between annual income ten years after $(t+10)$ and one year before $(t-1)$ the business was established. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t-1$ from the full distribution including both wage earners and business owners in our baseline sample.

Figure 4: Gains in disposable income by parental ranks
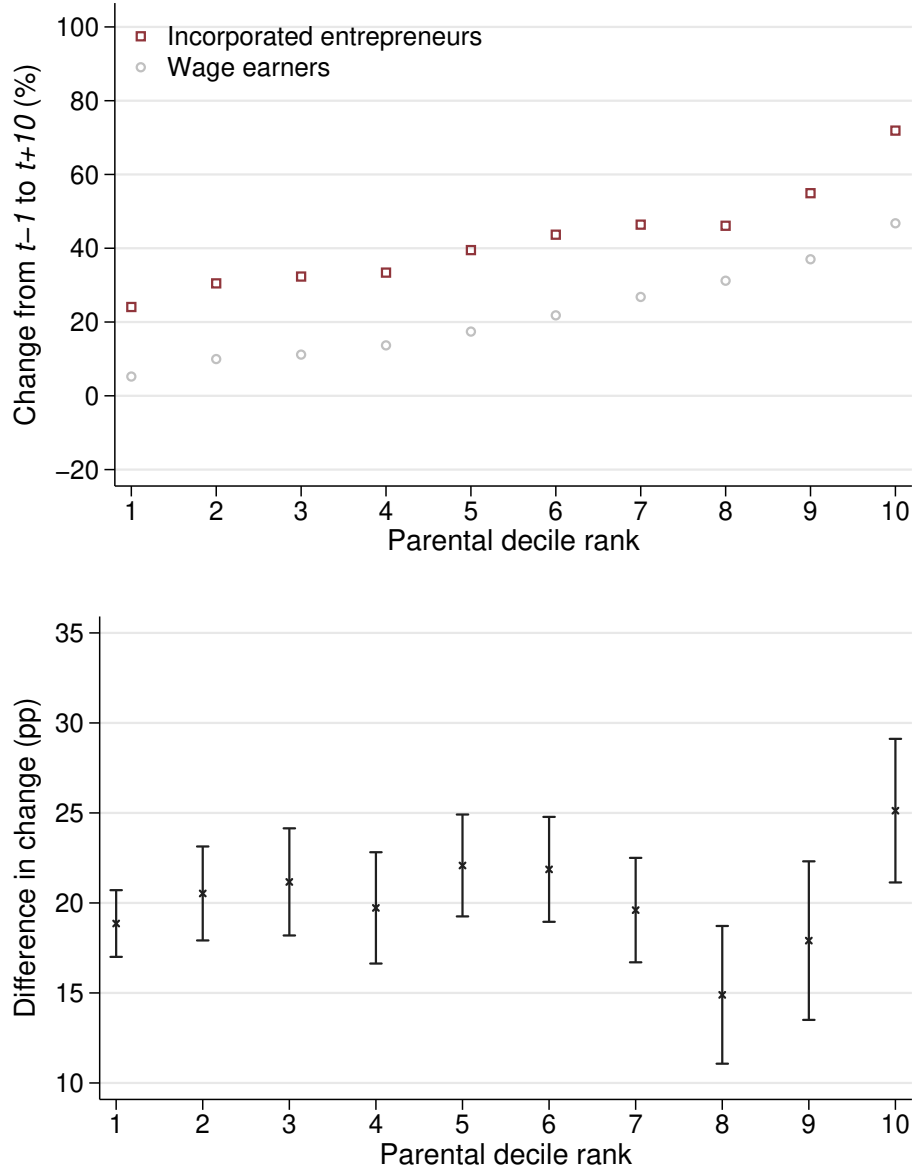
Notes: The figure shows the monetary gains in disposable income from incorporated entrepreneurship in percentages compared to wage earners by parental income rank deciles. The top panel presents the gains by group and the lower panel the difference between entrepreneurs and wage earners. We define *Gain* as the log difference between annual income ten years after $(t+10)$ and one year before $(t-1)$ the business was established. For wage earners, pseudo-starts are drawn from a uniform distribution. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old.

Figure 5: Gains in disposable income by individual and parental income ranks interacted
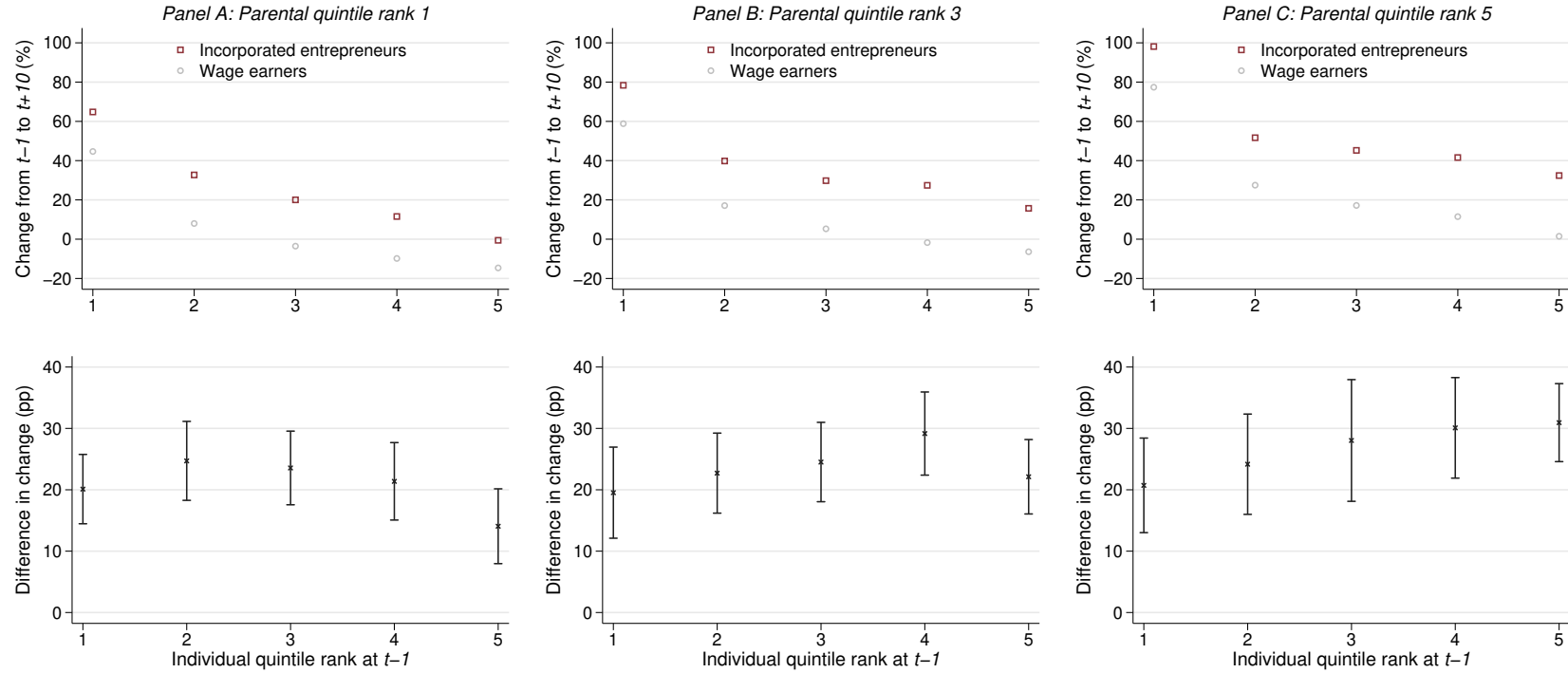
Notes: The figure shows the monetary gains in disposable income from incorporated entrepreneurship compared to wage earners by individual and parental income rank quintiles. The left-hand side panel shows the percentage gains between ten years after $(t+10)$ and one year before $(t-1)$ the business was established for those located in the first quintile of parental income distribution by different individual income in $(t-1)$ (horizontal axis). The middle and right-hand side panels show similar figures for individuals in the third and fifth parental income quintiles, respectively.

Figure 6: Rank-rank correlations
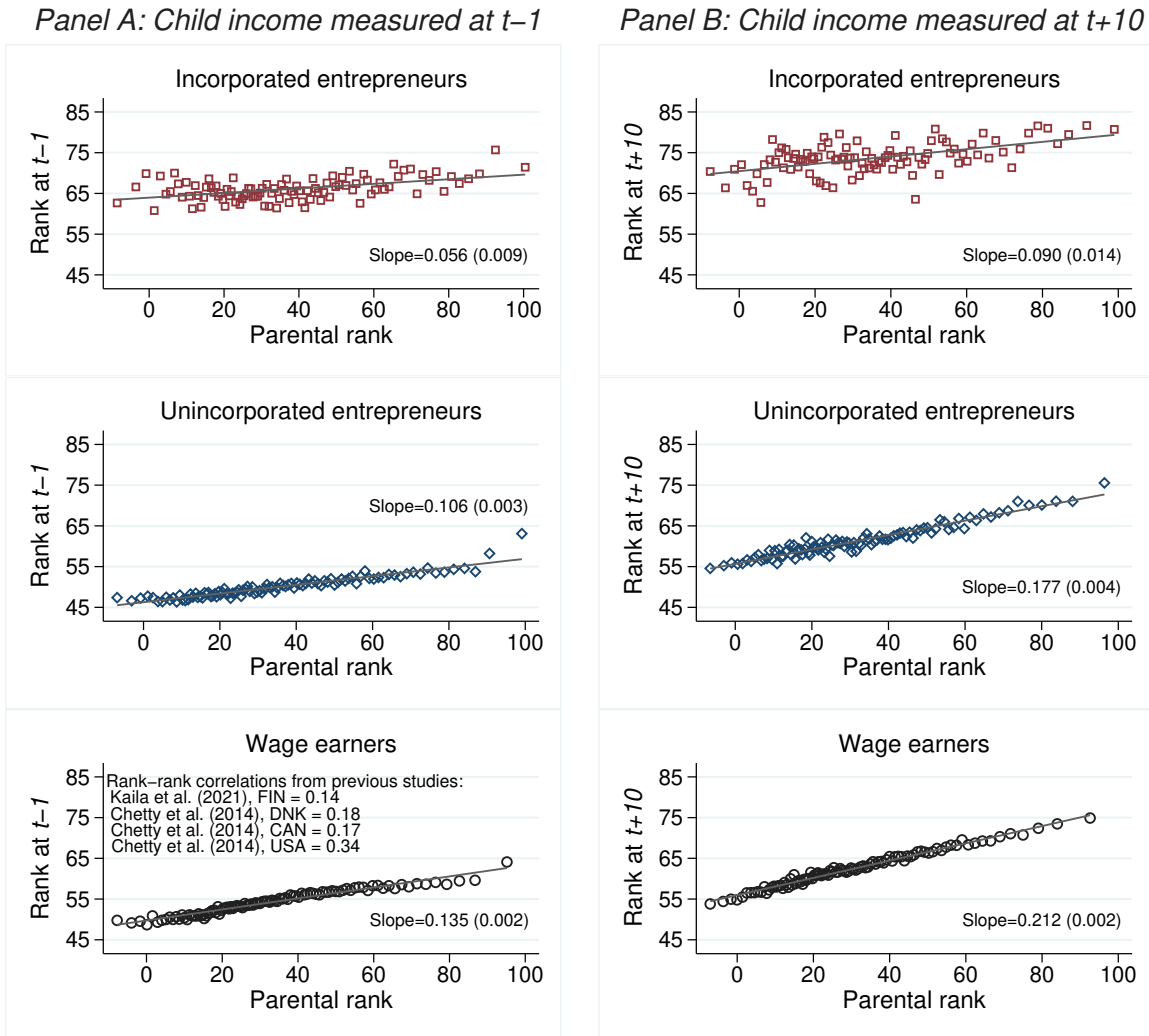
Notes: The figure presents the correlations between individual and parental income ranks for business owners (incorporated and unincorporated) and wage earners conditional on the age of the children in one year before $(t-1)$ and ten years after $(t+10)$ the business was established. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t-1$ from the full distribution including both wage earners and business owners in our baseline sample. Parental income rank is calculated using the average annual household income when the parents were 45—50 year old.

Figure 7: Firm-level outcomes by individual and parental income ranks separately
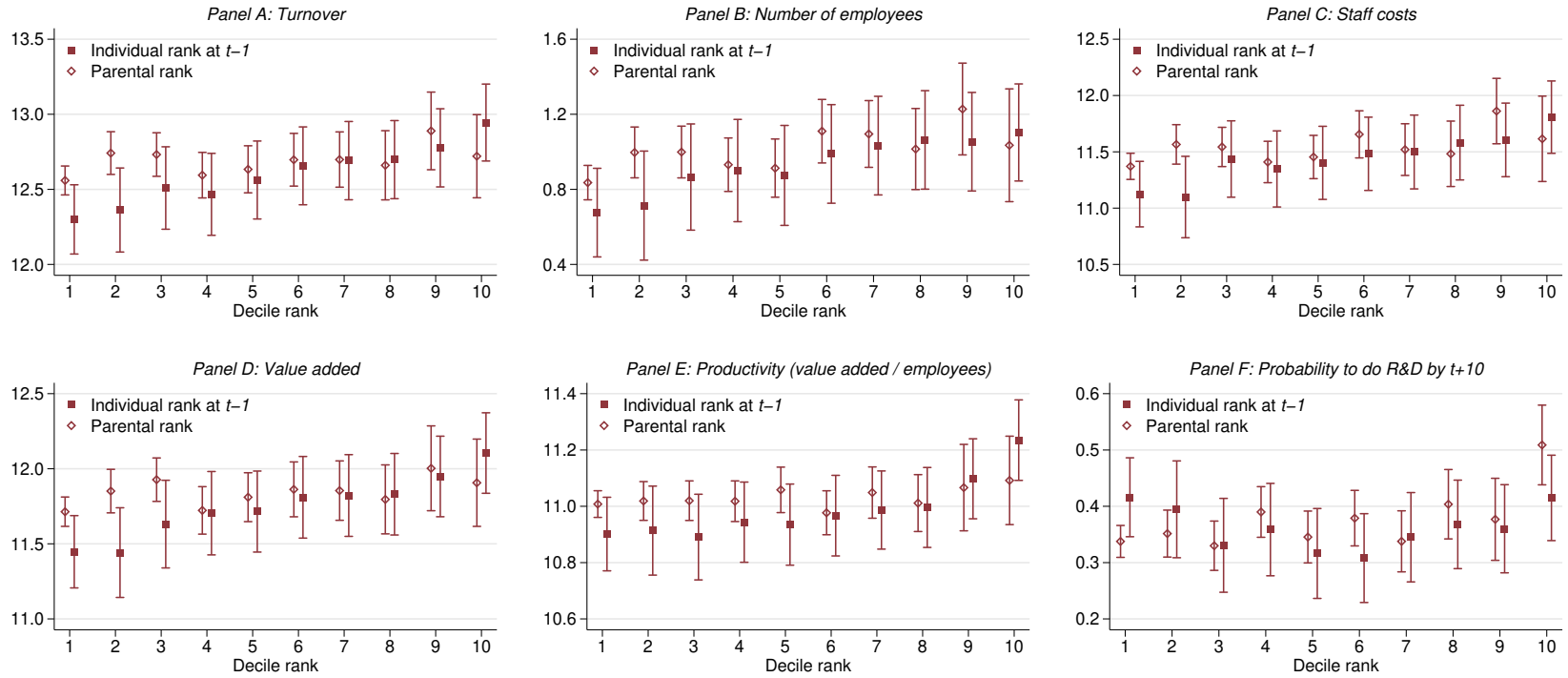
Notes: The figure shows firm-level outcomes by individual and parental income distributions separately. In Panels A-E, the outcomes are in log scale and are observed ten years after the firm was established. Panel F presents the probability to have R&D investments during the first ten years of the firm's lifespan.

Figure 8: Initial capital stock by individual and parental income ranks

Panel A: Initial capital stock by individual rank

Panel B: Initial capital stock by parental rank
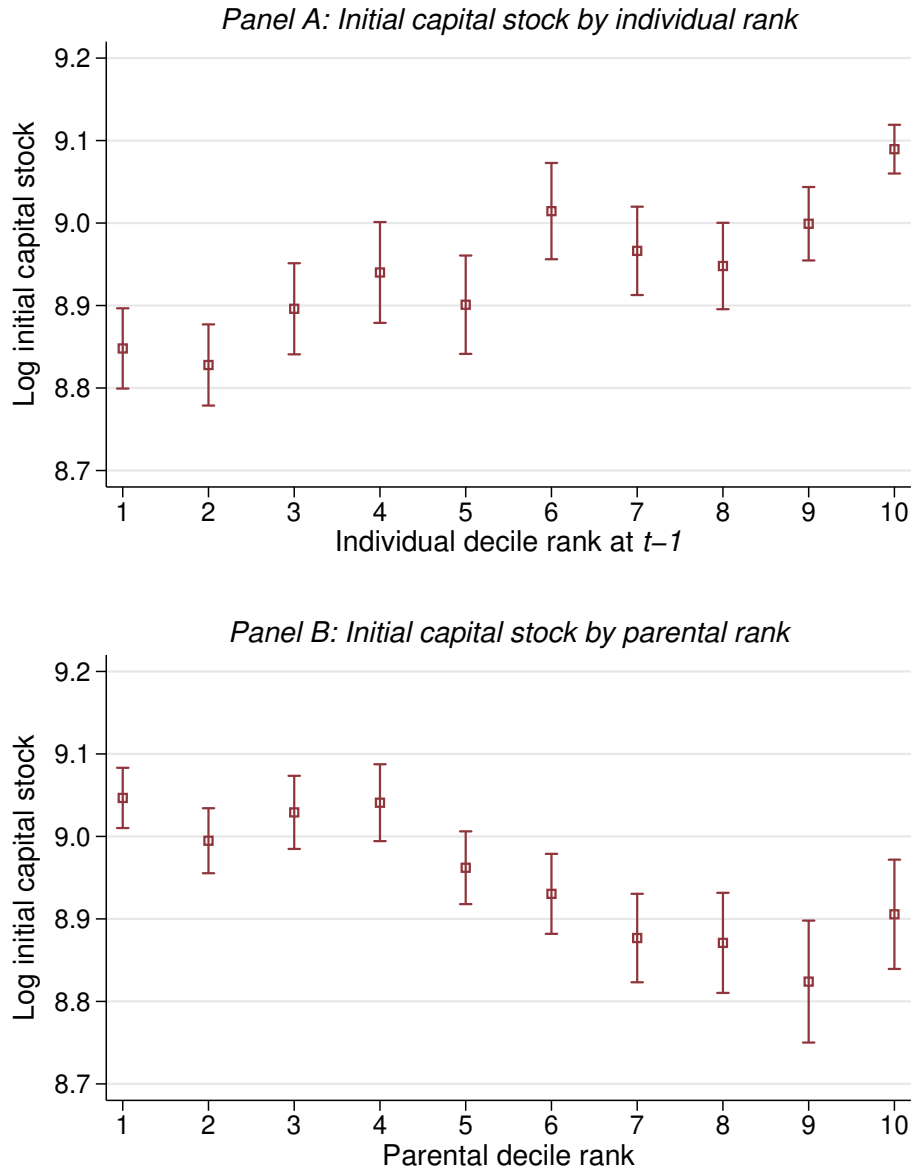
Notes: The figure shows the average initial capital stock of the incorporated businesses at the year of establishment by the owners' individual income ranks one year before establishing the business ($t-1$) and by their parental income ranks. Individual income ranks are calculated from the distribution of disposable income in $t-1$ including all individuals in our baseline sample. Parental income is calculated as average annual household income when the parents were 45–50 year old.

Figure 9: Firm-level outcomes by individual and parental income ranks interacted
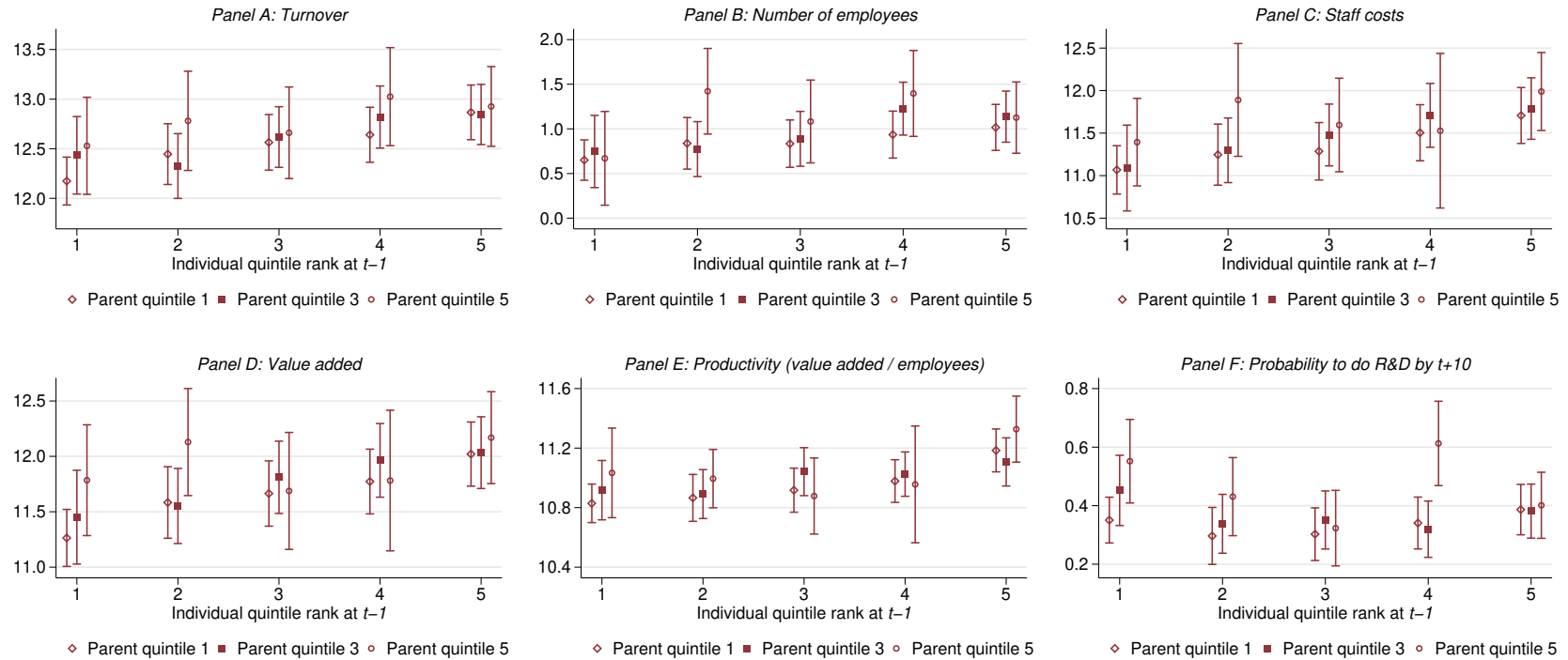
Notes: The figure shows firm-level outcomes by individual and parental income distributions interacted. The diamonds show the outcomes for those located in the first quintile of parental income distribution by different individual income in $(t-1)$ (horizontal axis). The squares and circles show outcomes for individuals in the third and fifth parental income quintiles, respectively. In Panels A-E, the outcomes are in log scale and are observed ten years after the firm was established. Panel F presents the probability to have R&D investments during the first ten years of the firm's lifespan.

Figure 10: Survival rates by individual and parental income ranks
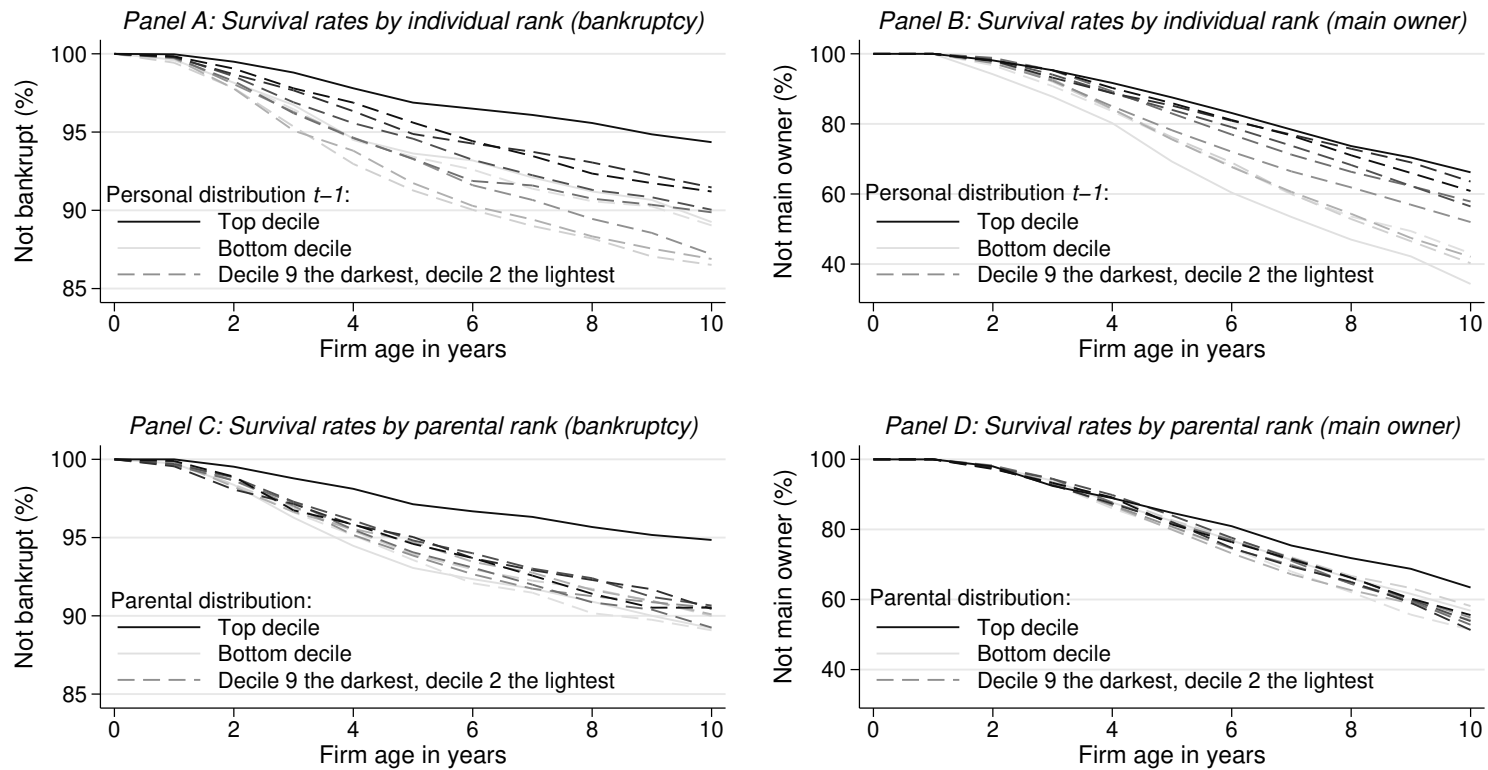
Notes: The figure shows the share of incorporated business not bankrupt by firm age, and by the owners' individual income ranks one year before establishing the business (Panel A) and by their parental income ranks (Panel C). Panels B and D show similar break-downs by not being the main owner of the business established at $t = 0$. Individual income ranks are calculated from the distribution of disposable income in $t - 1$ including all individuals in our baseline sample. Parental income is calculated as average annual household income when the parents were 45–50 year old.

Figure 11: Income ranks at $t-1$ and $t+10$ for new incorporated entrepreneurs and income ranks for all incorporated entrepreneurs 2006–2016
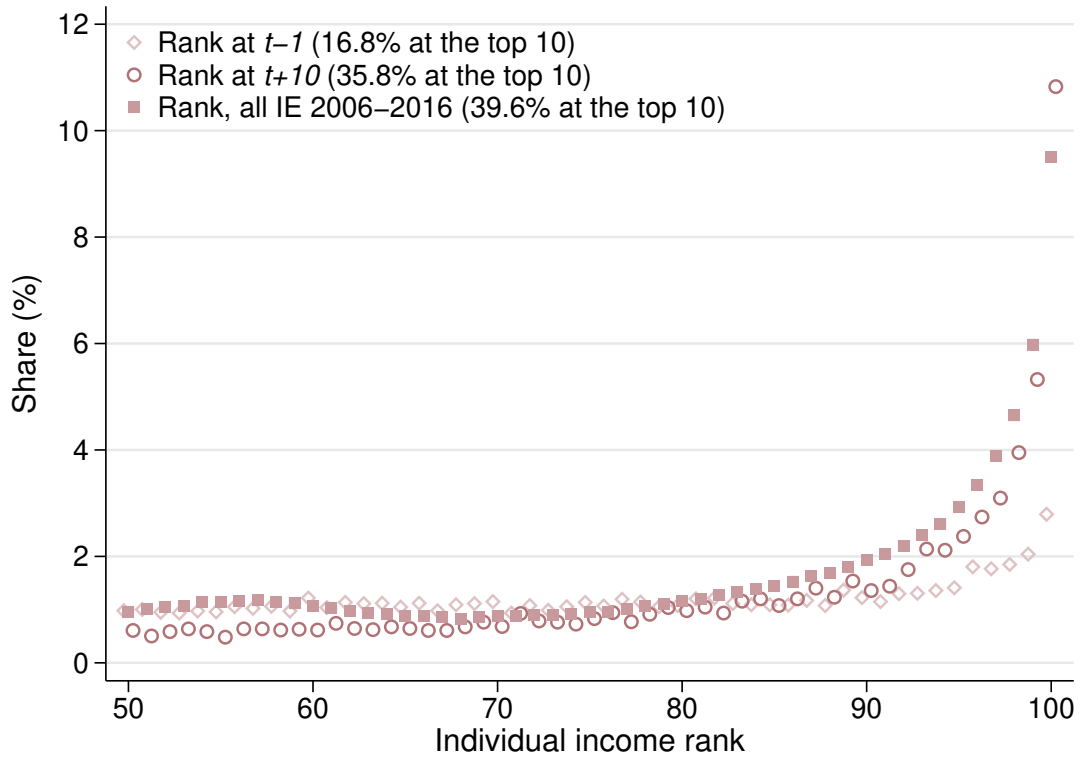
Notes: Figure presents the percentage shares of new incorporated business owners by their individual income ranks one year before $(t-1)$ and ten years $(t+10)$ after establishing the business. The shares are plotted for those entrepreneurs that we observe in the data in both years. Individual income ranks are calculated from the distribution of disposable income in $t-1$ including all individuals in our baseline event study sample. The ranks of all incorporated entrepreneurs refer to the entire pool of them 2006–2016 (not just the new entrepreneurs), and ranks are calculated among the full population of Finnish individuals over 16 years of age.

Figure 12: Probability to reach the top of the income distribution
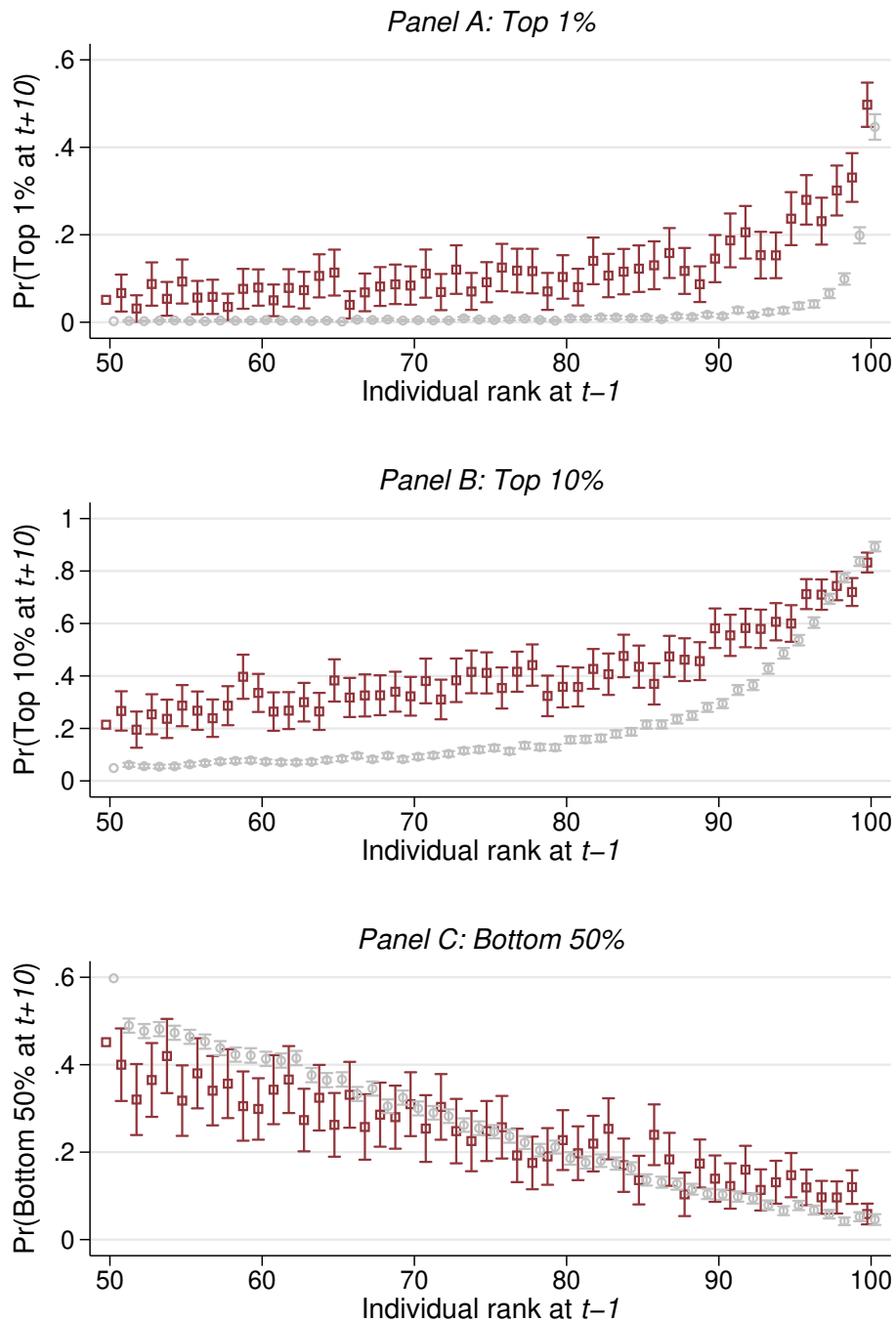
Figure 13: Share of entrepreneurs among the top 1% of market income

Panel A: Share of top 1 % earners

Panel B: Share of top 1 % earners when weighted using shares in population
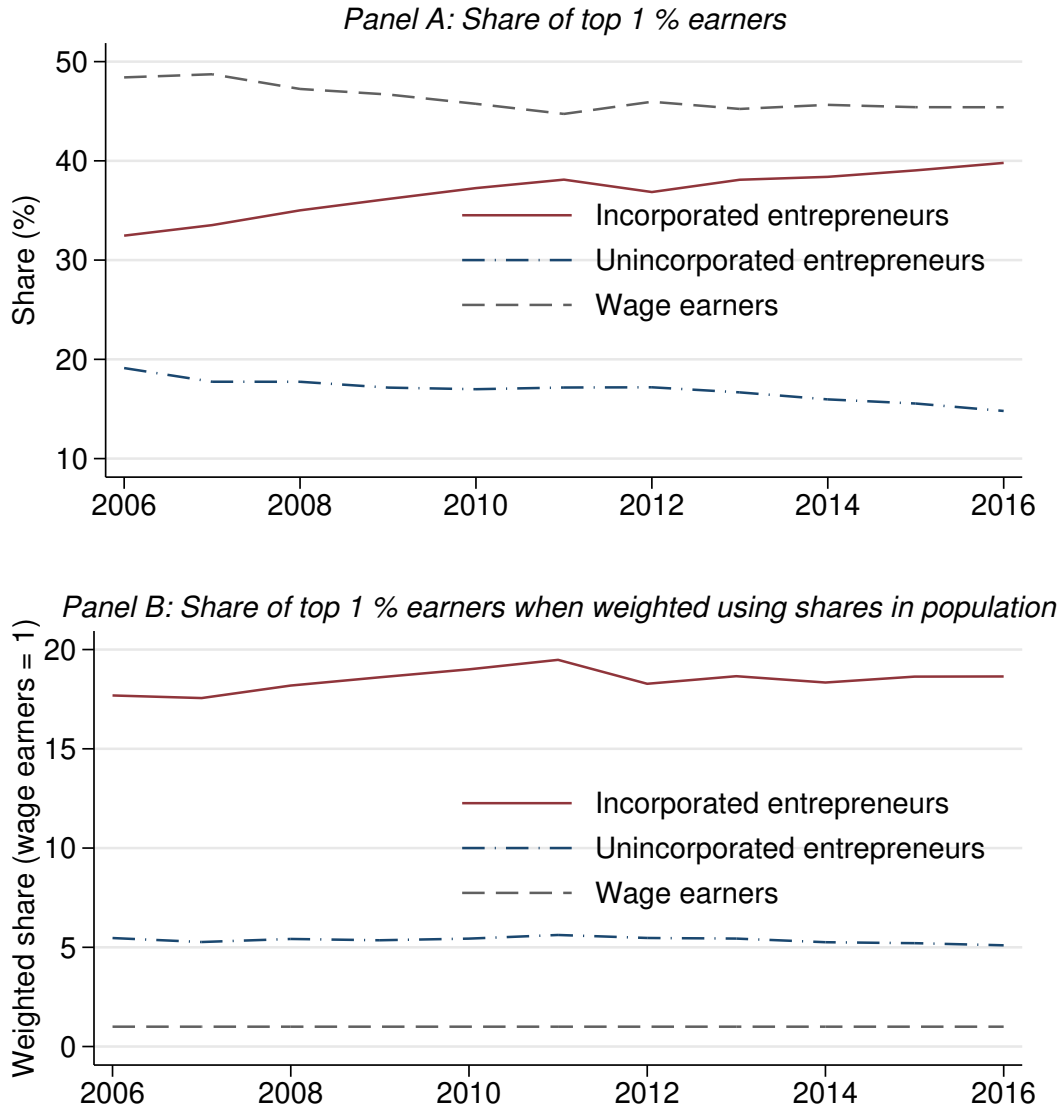
Notes: Panel A of the figure presents the shares of incorporated and unincorporated business owners and wage earners in the top 1% of the individual-level market income distribution in each year in 2006–2016 (full population of Finnish individuals over 16 years of age). Panel B shows the shares of these groups when weighting them by their relative share across the whole population. In Panel B, the share of wage earners is normalized to one in each year.

Figure 14: Composition of market income sources by income percentiles
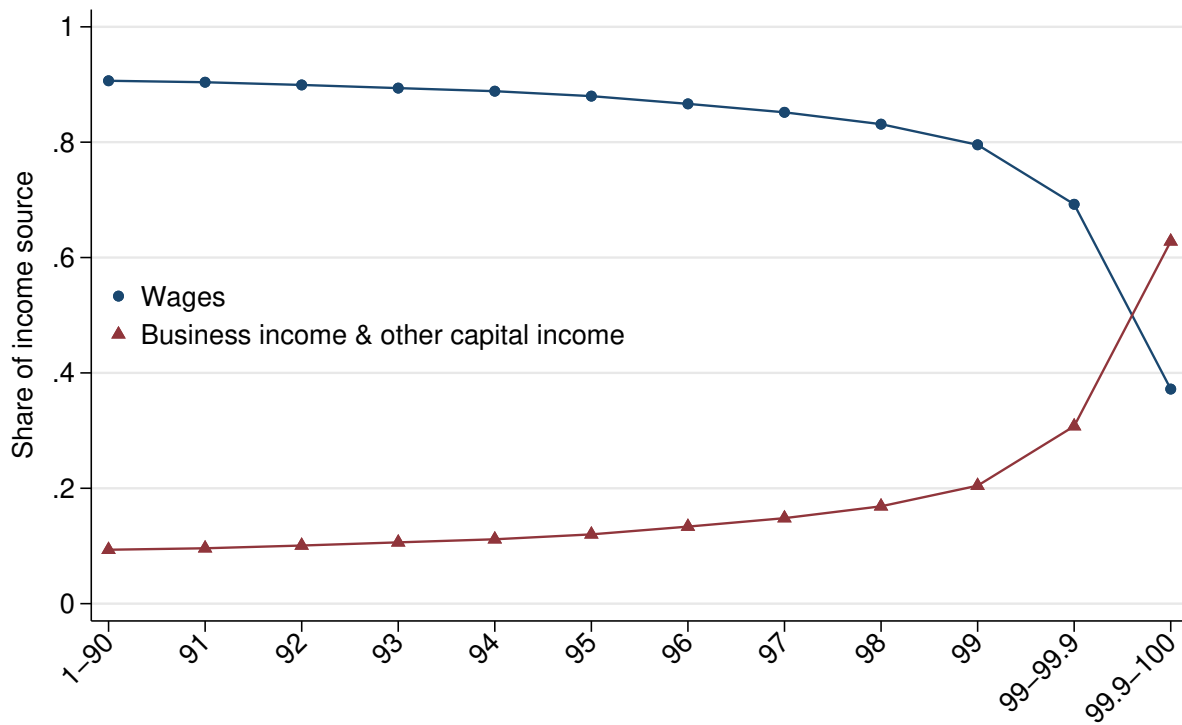
Notes: The figure plots the income composition between wages and business income + other capital income in the top 10% of the market income distribution for the full population of Finnish individuals over 16 years of age. In addition, the figure includes the income shares when including to business income the annual retained earnings of the firms divided to each firm owner based on their ownership share of the firm.

Appendix

A   Additional Tables and Figures

Table A1: Number of new businesses and business owners 1998–2014

	Number of firms or owners
Panel A: New incorporated firms	
All new firms	142,213
New firms with a positive turnover	129,703
New firms with a positive turnover and information about ownership structure	74,558
Panel B: Owners of new incorporated firms with a positive turnover in the first year of operation	
All owners	139,685
Main owners	95,109
Main owners with a parental link in data	58,897
Main owners with a parental link in data and no prior entrepreneurial experience	28,707
Panel C: New unincorporated firms	
All new firms	344,100
New firms with a positive turnover	316,063
New firms with a positive turnover and information about ownership structure	316,063
Panel D: Owners of new unincorporated firms with a positive turnover in the first year of operation	
All owners	317,686
Main owners	316,950
Main owners who derive the majority of their annual earnings as business income	152,700
Main owners who derive the majority of their annual earnings as business income with a parental link in data	102,140
Main owners who derive the majority of their annual earnings as business income with a parental link in data and no prior entrepreneurial experience	61,876

Notes: Table presents how the number of new businesses and their owners is shaped by our definitions and data availability.

Table A2: Sensitivity of gains from entrepreneurship to estimation sample

		Disposable income		
Sample	Observations	t-1	t+10	Increase
Baseline, mean	13,467	28,390	42,461	29.1 %
(SE of mean)		293	674	0.8 %
Switchers (UIE-IE) dropped, mean	11,538	27,933	43,384	33.0 %
(SE of mean)		339	789	0.9 %
Parent entrepreneur: yes, mean	7,697	28,000	42,453	29.0 %
(SE of mean)		335	670	1.2 %
Parent entrepreneur: no, mean	5,770	28,925	42,473	29.3 %
(SE of mean)		520	1,310	1.2 %
Entrepreneur after 5 years: yes, mean	8,873	28,248	44,585	32.5 %
(SE of mean)		334	915	1.0 %
Entrepreneur after 5 years: no, mean	4,594	28,667	38,279	22.5 %
(SE of mean)		567	871	1.6 %
Starts 1998-2005 (dividend-based), mean	4,932	29,204	47,591	37.2 %
(SE of mean)		592	969	1.4 %
Starts 2006-2014 (FLOWN-based), mean	8,535	27,911	39,444	24.4 %
(SE of mean)		307	905	1.0 %
Starts 2006-2014 (dividend-based), mean	1,654	32,875	45,517	24.9 %
(SE of mean)		632	1131	2.0 %

Notes: Table presents the increase in disposable income among incorporated entrepreneurs from one year before to ten years after they established their first business using different subsamples. First, we consider how the gains from entrepreneurship are affected if we exclude those who had an unincorporated business before becoming incorporated. Second, similarly to Figure A7, we show the gains separately for those with and without entrepreneurial parents. Third, we separate entrepreneurs by whether they still are or are not the main owners of the business five years afters the business was established. Finally, we show how the gains differ by years and by how we identify incorporated entrepreneurs from the data.

Figure A1: New entrepreneurs over the sample years
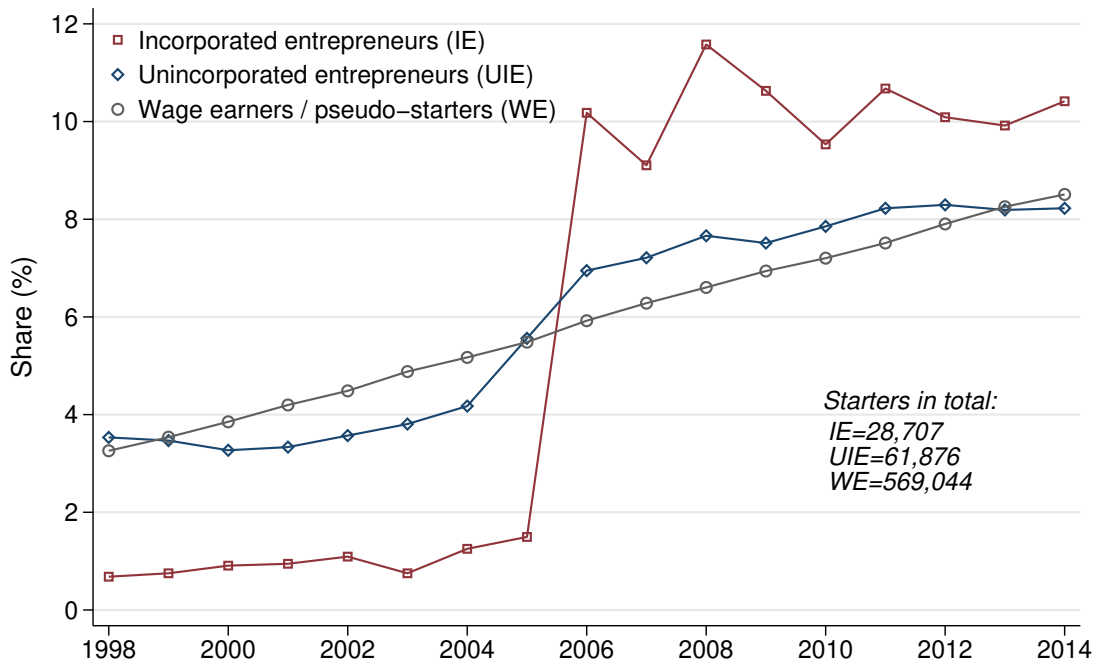
Notes: Figure presents the share of new owners of new firms for each year for incorporated and unincorporated firms, and the share for pseudo-starts by year randomly drawn for wage earners. The discontinuous jump in the number of new incorporated entrepreneurs stems from the change in the data source for defining new business owners in 2006 (see Section 2.2 for more details).

Figure A2: Share of new entrepreneurs by parental income ranks, new firms vs. cross-sectional evidence
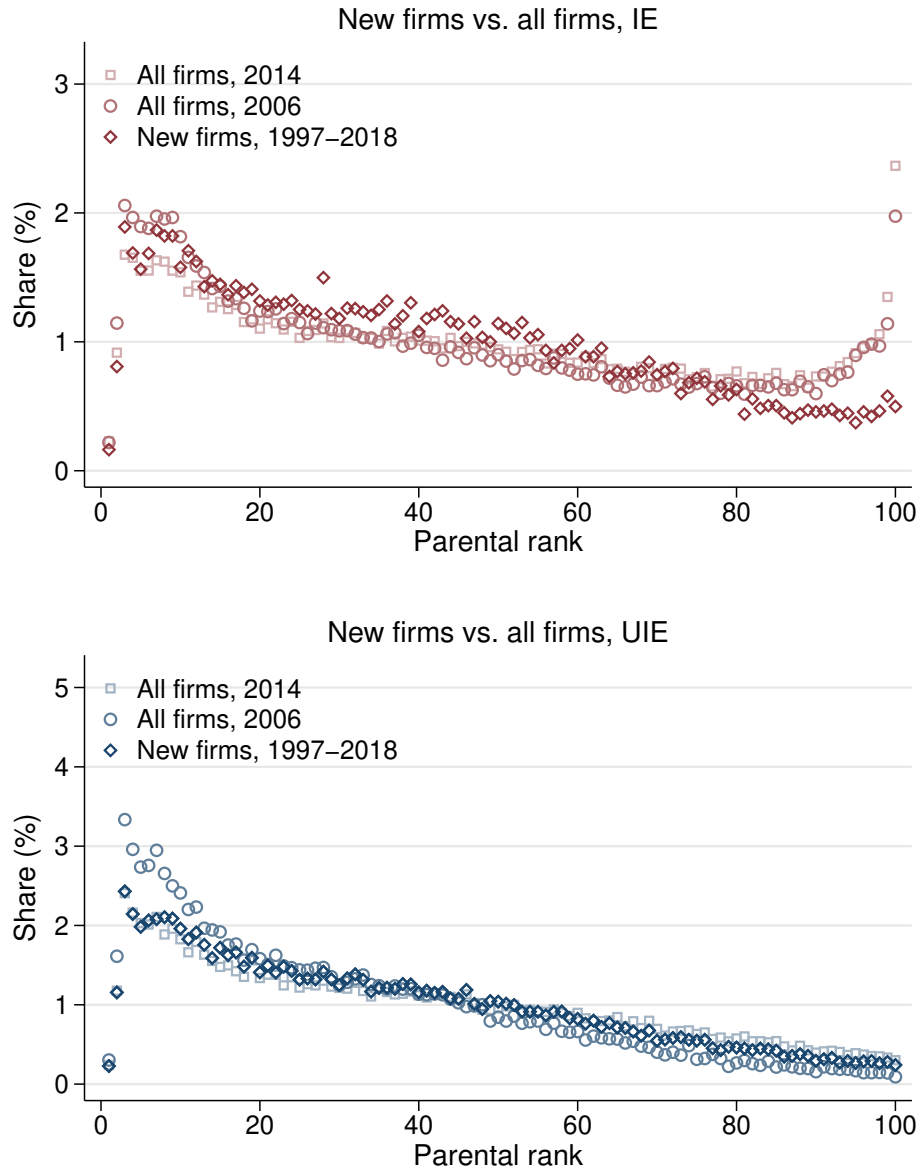
Notes: Figure presents the percentage shares of incorporated (red) and unincorporated (blue) business owners by their individual income ranks by their parental income ranks. The diamonds correspond to the lower panel of Figure 1 and shows the shares of new business owners. The circles and squares show shares for all entrepreneurs, not only the new ones, using two cross-sections of data (2006 and 2014).

Figure A3: Share of new incorporated entrepreneurs by parental entrepreneurship

Notes: Figure presents the percentage shares of new incorporated business owners by their individual income ranks one year before establishing the business ($t-1$) and by their parental income ranks. The sample of entrepreneurs is divided in two by whether at least one of their parent was an entrepreneur. Individual income ranks are calculated from the distribution of disposable income in $t-1$ including all individuals in our baseline sample. Parental income is calculated as average annual household income when the parents were 45–50 year old. Parents are classified as entrepreneurs if they are labeled as a business owner for at least 5 years according to the socio-economic status defined by Statistics Finland.

Figure A4: Share of new entrepreneurs by age
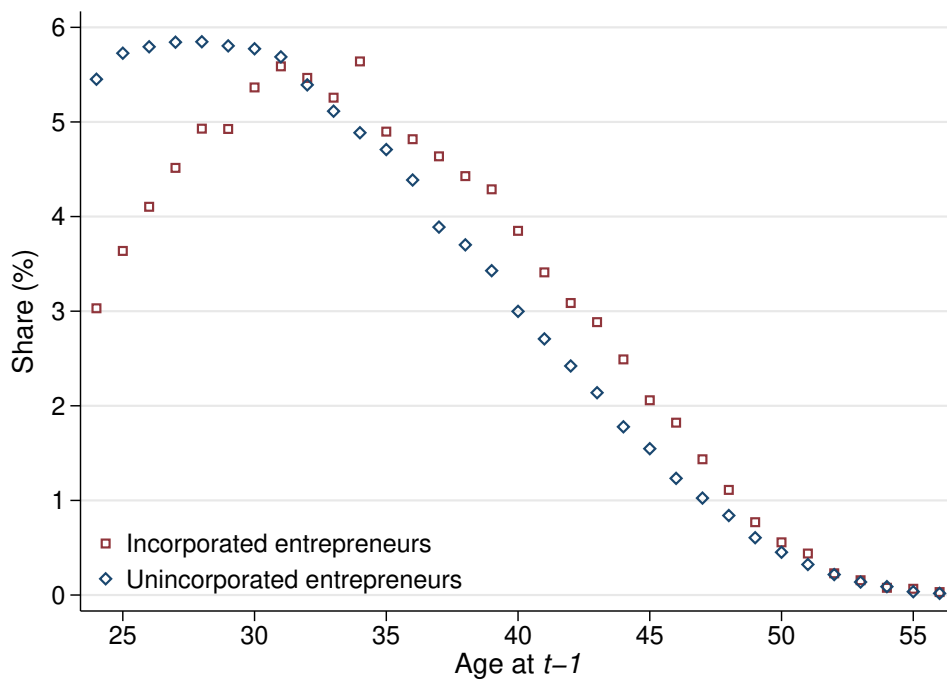
Notes: Figure presents the percentage shares of new incorporated (red squares) and unincorporated (blue diamonds) business owners by their age one year before establishing the business ($t-1$).

Figure A5: Share of new entrepreneurs by education
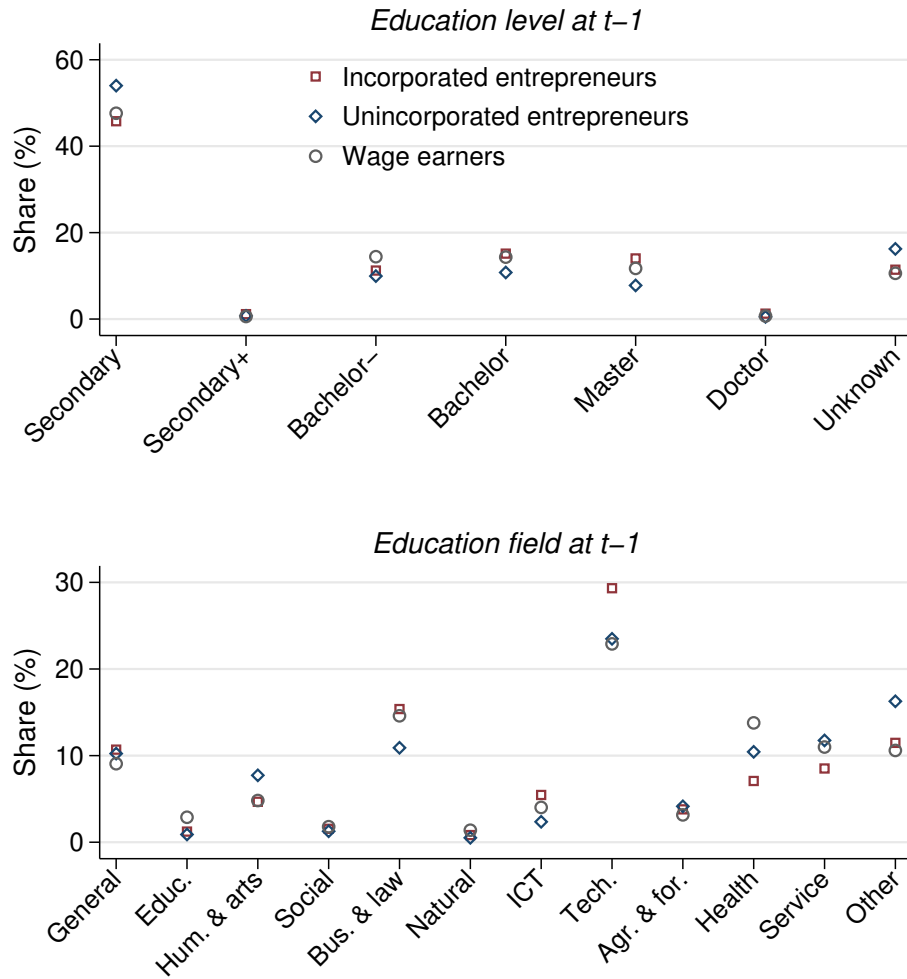
Education level at t−1

Education field at t−1

Notes: Figure presents the percentage shares of new incorporated (red squares) and unincorporated (blue diamonds) business owners by their education one year before establishing the business ($t-1$). The share of wage earners (grey dots) indicates the share of pseudo-starters. Education level and field correspond to ISCED 2011 classification.

Figure A6: Disposable income trajectories, coarsened exact matching
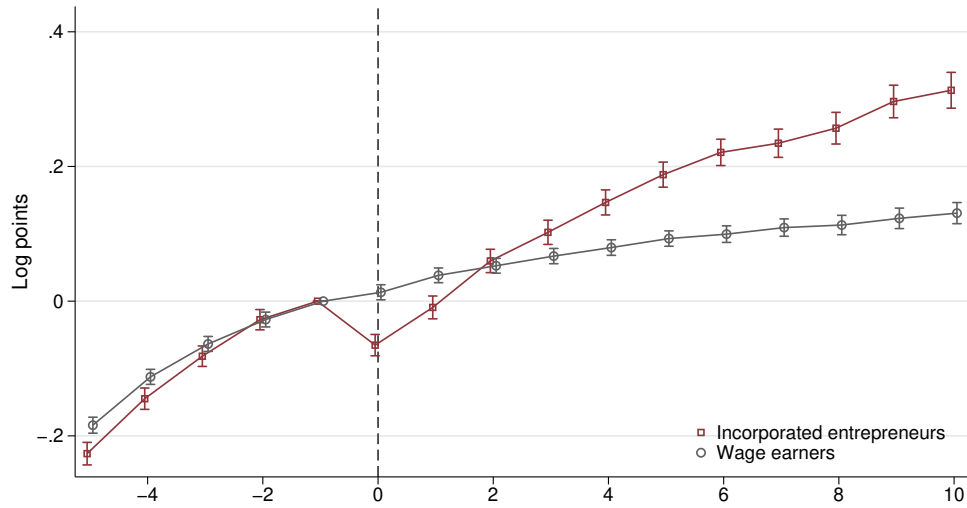
Notes: The figure presents the disposable income trajectories of incorporated business owners and wage earners before and after the business was established ($t = 0$), relative to the year $t − 1$ (denoted by zero in the figure). For wage earners, pseudo-starts are drawn from a uniform distribution. The two groups are matched using coarsened exact matching (CEM). We use the average decile income rank in $t − 3$ and $t − 1$, the change in rank between $t − 3$ and $t − 1$, parental income rank, a dummy for parent being an entrepreneur, average share of labor earnings relative to total income in $t − 3$ and $t − 1$, and age, gender, the place of residence and the number of children in $t − 1$ in the matching procedure.

Figure A7: Income trajectories by parental entrepreneurial background
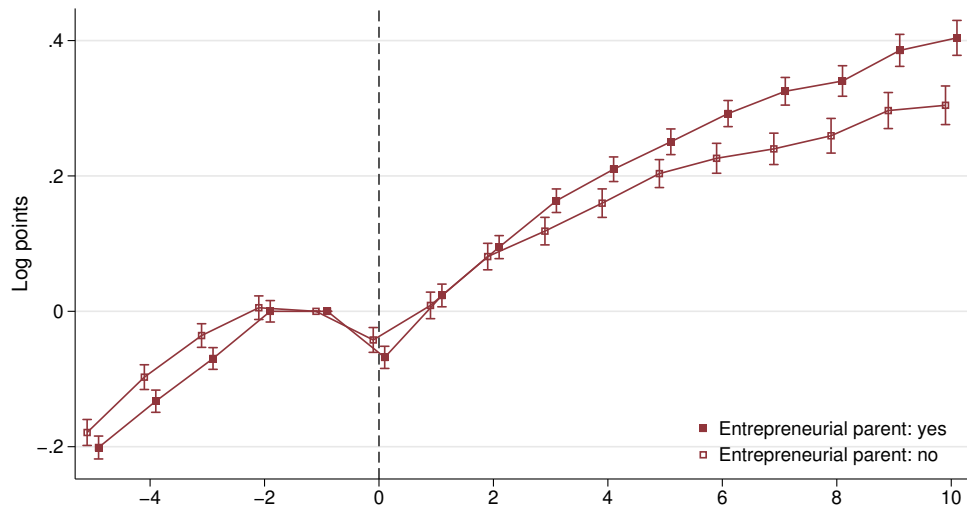
Notes: The figure presents the unconditional disposable income trajectories of incorporated business owners by their parents entrepreneurial background before and after the business was established ($t = 0$), relative to the year $t − 1$ (denoted by zero in the figure). Parents are classified as entrepreneurs if they are labeled as a business owner for at least 5 years according to the socio-economic status defined by Statistics Finland.

Figure A8: Income trajectories by being an entrepreneur after 5 years
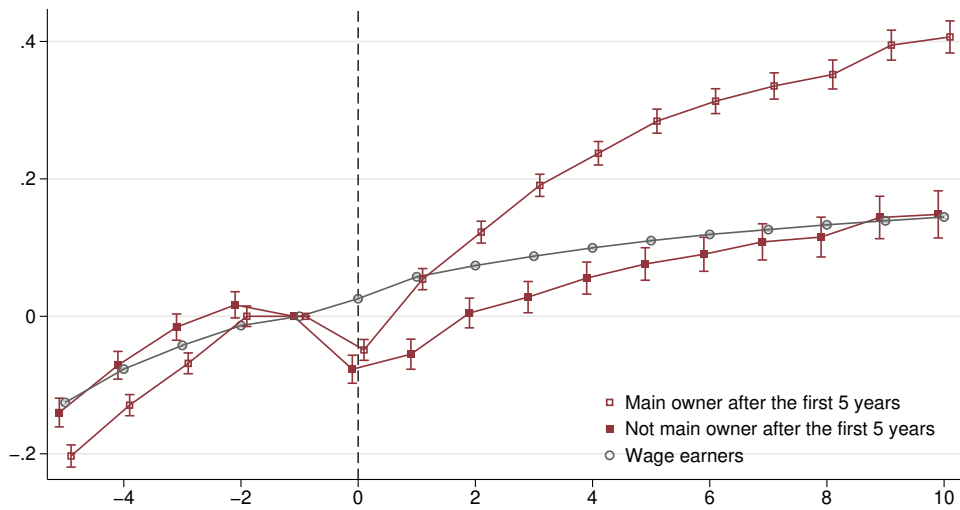
Notes: The figure presents the unconditional disposable income trajectories of incorporated business owners separately for entrepreneurs who still are or are not the main owners of the newly established business five years afters the business was established. The trajectories are portrayed before and after the business was established ($t = 0$), relative to the year $t - 1$ (denoted by zero in the figure). For wage earners, the reference group, pseudo-starts are drawn from a uniform distribution.

Figure A9: Gains in disposable income by individual and parental income ranks: the entire income trajectories for incorporated entrepreneurs and wage earners

Notes: The figure shows the income trajectories before and after the business was established ($t = 0$), relative to the year $t - 1$ for incorporated entrepreneurs and wage earners by individual and parental income rank quintiles. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t - 1$ from the full distribution including both wage earners and all business owners (both the incorporated and unincorporated) in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old. The horizontal axis denotes years relative to the start as an entrepreneur or pseudo-start. The vertical axis is log points. Personal rank increases from left to right, parental rank from up to down.
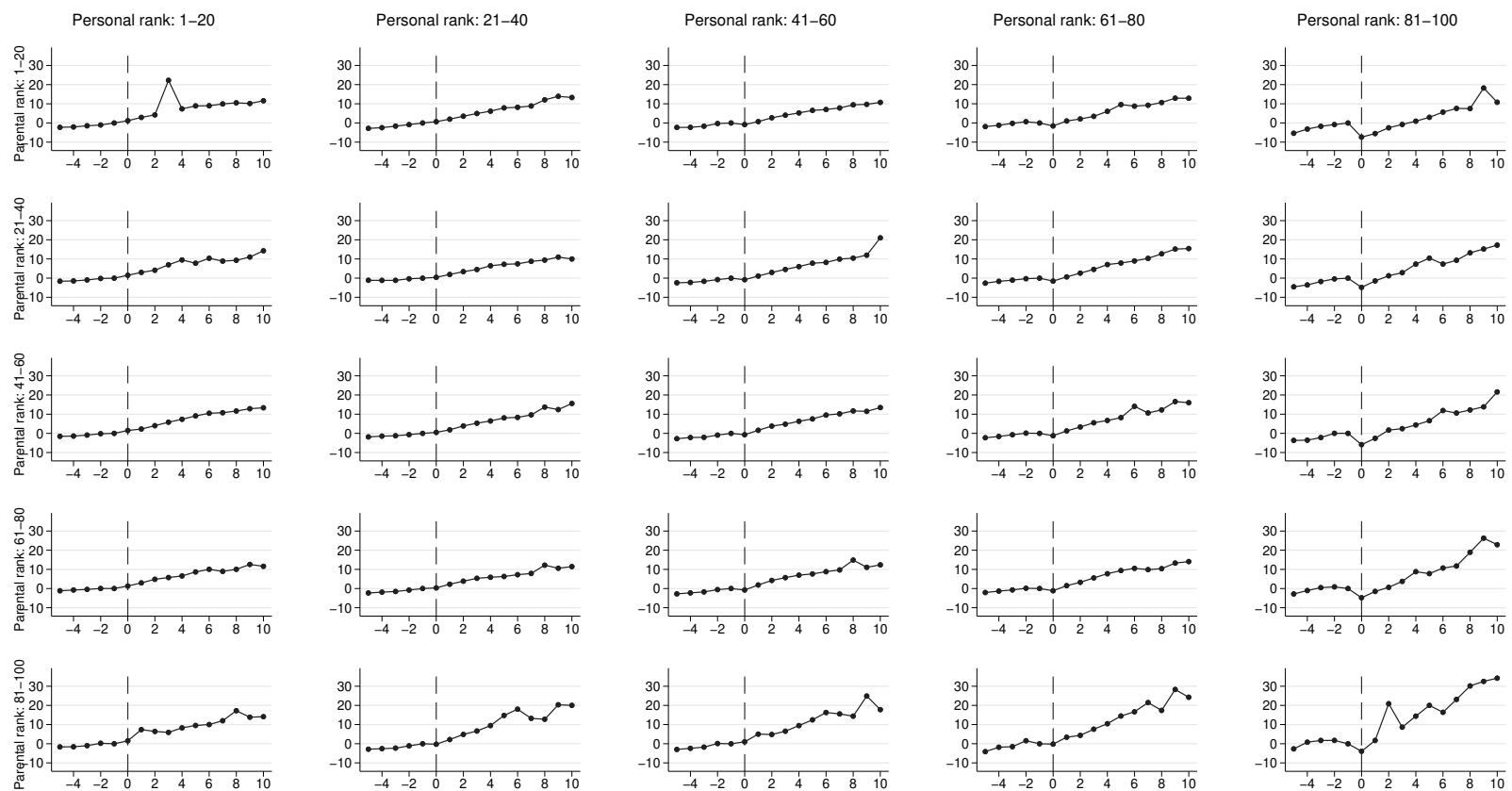
Figure A10: Gains in disposable income by individual and parental income ranks: the difference in entire income trajectories between incorporated entrepreneurs and wage earners


Notes: The figure shows the difference in income trajectories between incorporated entrepreneurs and wage earners before and after the business was established ($t = 0$), relative to the year $t − 1$ by individual and parental income rank quintiles. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t − 1$ from the full distribution including both wage earners and all business owners (both the incorporated and unincorporated) in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old. The horizontal axis denotes years relative to the start as an entrepreneur or pseudo-start. The vertical axis is log points. Personal rank increases from left to right, parental rank from up to down.

Figure A11: EUR gains in disposable income by individual and parental income ranks interacted
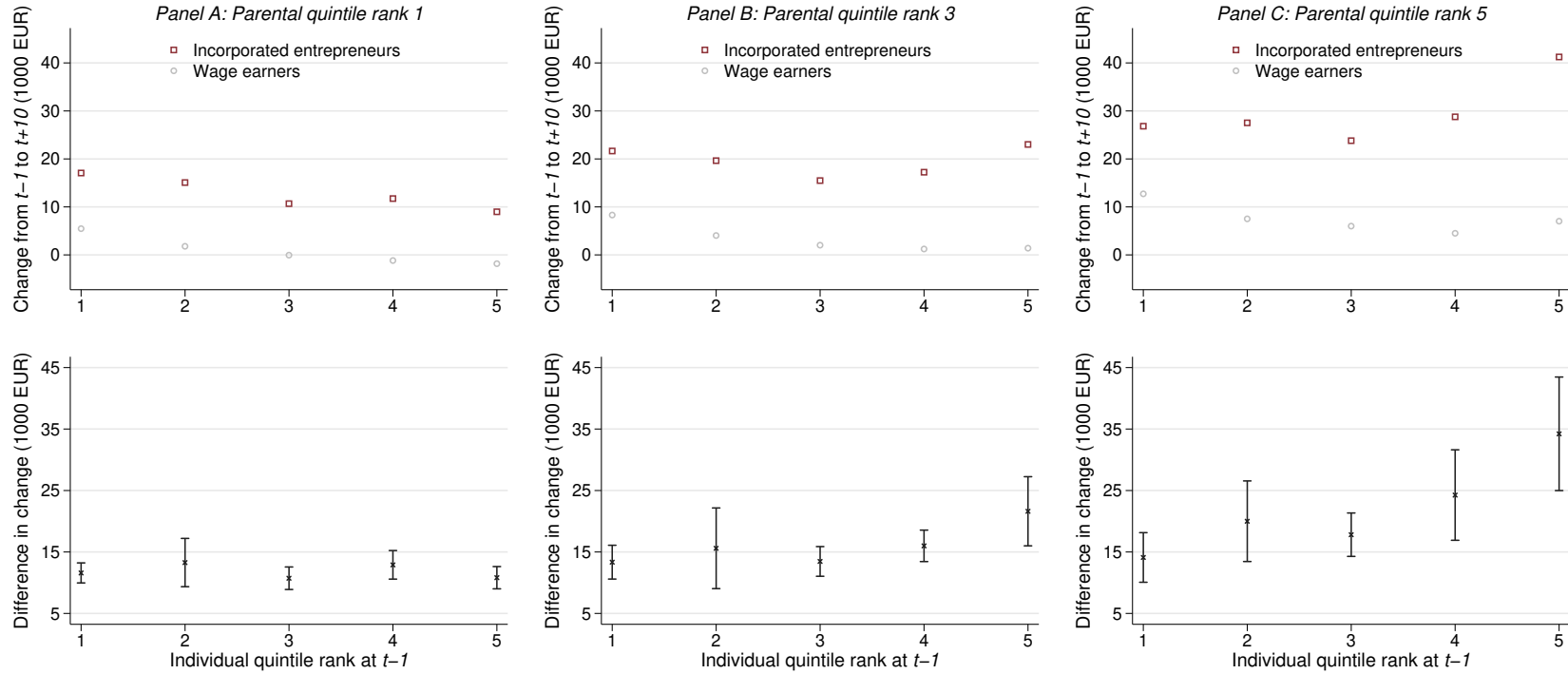
Notes: The figure shows the monetary gains in disposable income from incorporated entrepreneurship compared to wage earners by individual and parental income rank deciles. The left-hand side panel shows the gains denominated in euros between ten years after $(t+10)$ and one year before $(t-1)$ the business was established for those located in the first quintile of parental income distribution by different individual income in $(t-1)$ (horizontal axis). The middle and right-hand side panels show similar figures for individuals in the third and fifth parental income quintiles, respectively.

Figure A12: EUR Gains in disposable income by individual and parental income ranks: the entire income trajectories for incorporated entrepreneurs and wage earners
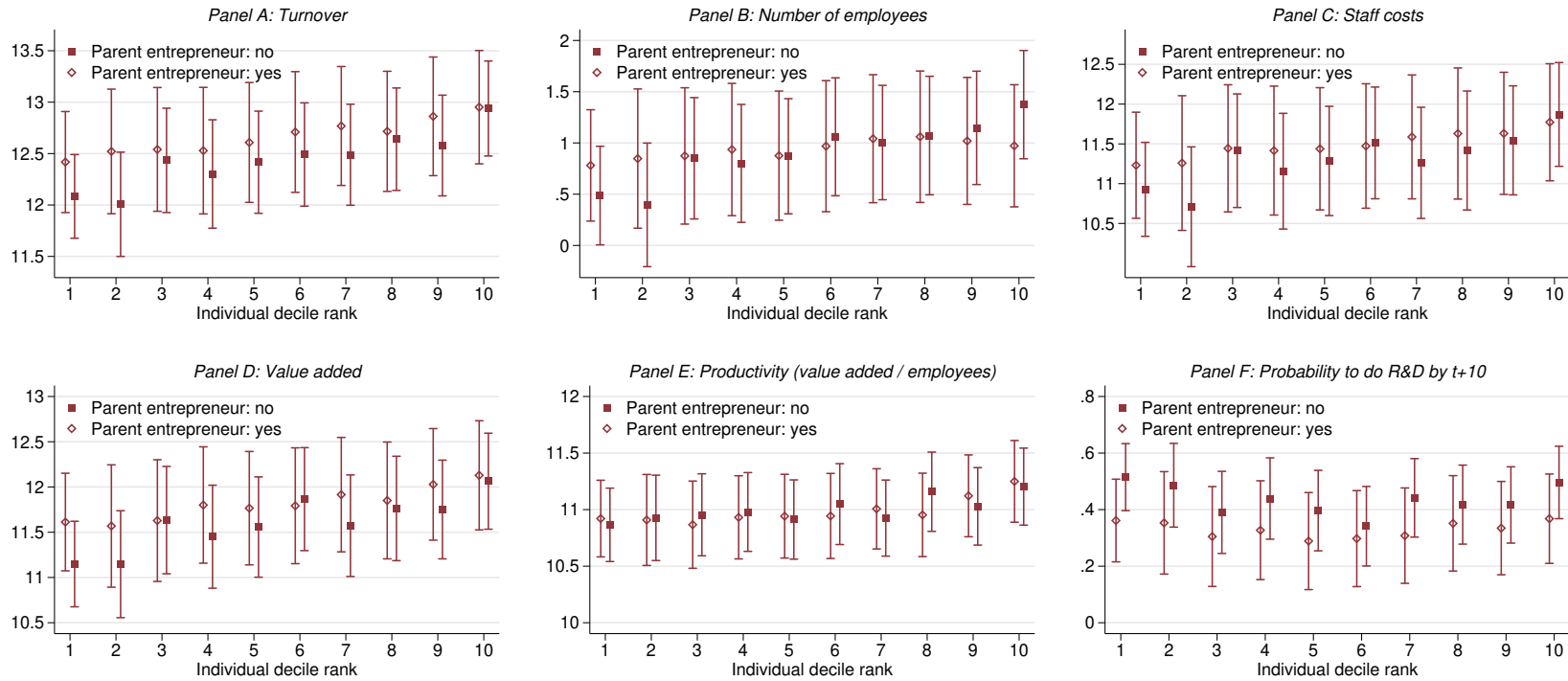

Notes: The figure shows the income trajectories before and after the business was established ($t = 0$), relative to the year $t − 1$ for incorporated entrepreneurs and wage earners by individual and parental income rank quintiles. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t − 1$ from the full distribution including both wage earners and all business owners (both the incorporated and unincorporated) in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old. The horizontal axis denotes years relative to the start as an entrepreneur or pseudo-start. The vertical axis is 1000 euros. Personal rank increases from left to right, parental rank from up to down.

Figure A13: EUR Gains in disposable income by individual and parental income ranks: the difference in entire income trajectories between incorporated entrepreneurs and wage earners

Notes: The figure shows the difference in income trajectories between incorporated entrepreneurs and wage earners before and after the business was established ($t = 0$), relative to the year $t − 1$ by individual and parental income rank quintiles. For wage earners, pseudo-starts are drawn from a uniform distribution. Individual income ranks are measured at $t − 1$ from the full distribution including both wage earners and all business owners (both the incorporated and unincorporated) in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old. The horizontal axis denotes years relative to the start as an entrepreneur or pseudo-start. The vertical axis is 1000 euros. Personal rank increases from left to right, parental rank from up to down.

Figure A14: Firm-level outcomes by gains in personal income
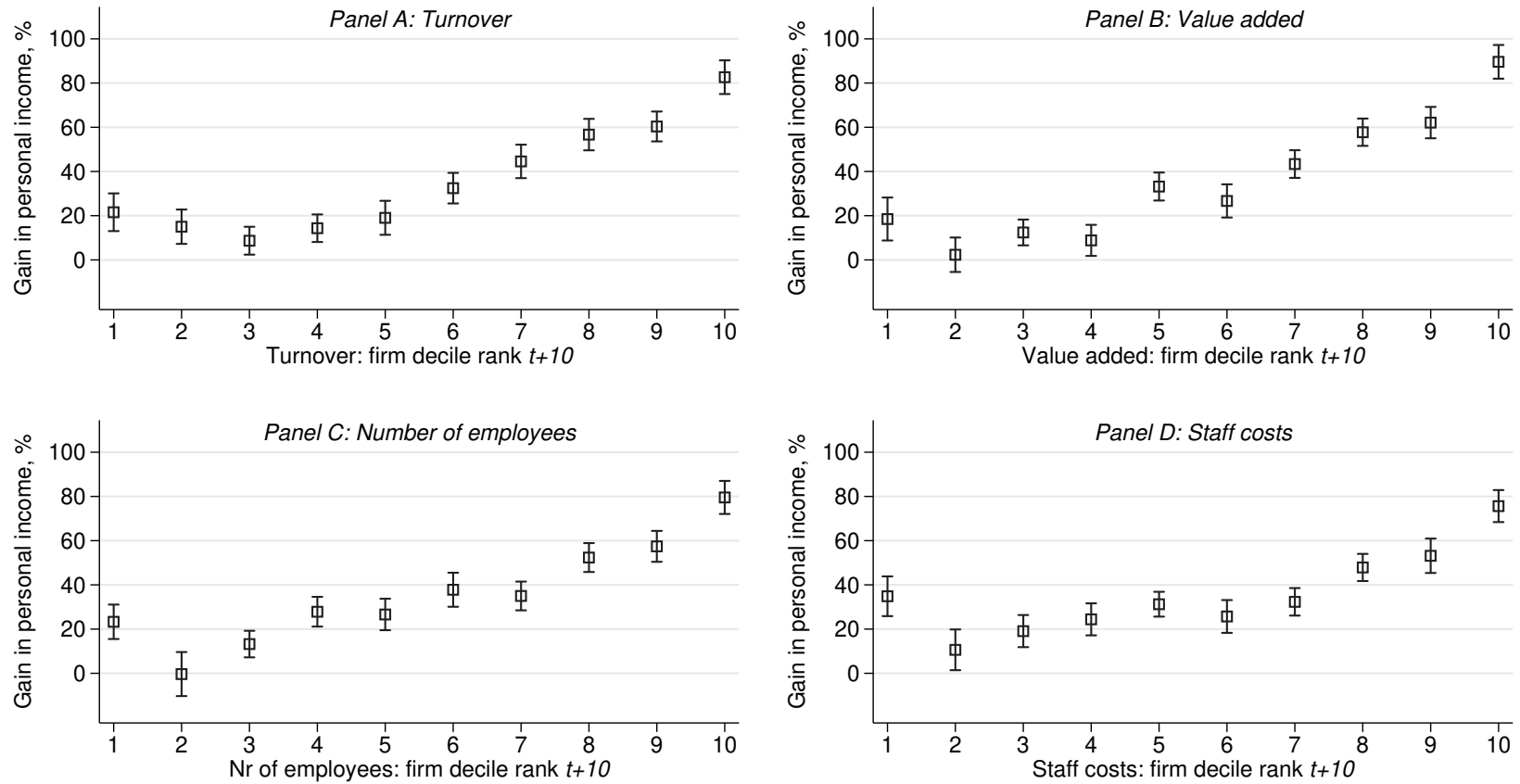
Notes: The figure shows the monetary gains in disposable income from incorporated entrepreneurship in percentages compared to firm-level outcomes ten years after the firm was established ($t+10$). Firm outcomes are expressed in decile ranks.
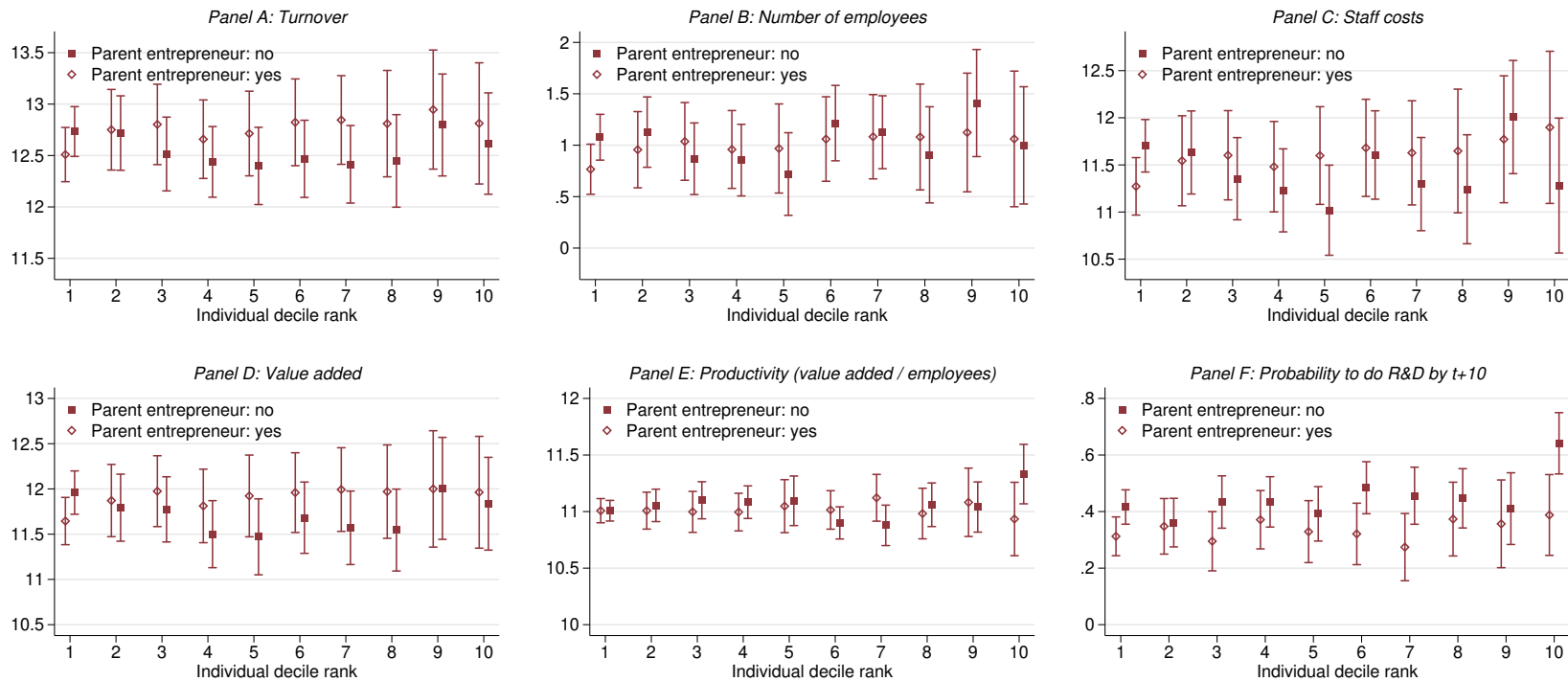
Figure A15: Firm-level outcomes by individual income ranks and by parental entrepreneurial background

Notes: The figure shows firm-level outcomes by individual income distributions and by parental entrepreneurial background. The income ranks are measured at $t-1$ from the full distribution of new business owners and wage earners (pseudo-starters) in our baseline event study sample. Parents are classified as entrepreneurs if they are labeled as a business owner for at least 5 years according to the socio-economic status defined by Statistics Finland. In Panels A-E, the outcomes are in log scale and are observed ten years after the firm was established. Panel F presents the probability to have R&D investments during the first ten years of the firm's lifespan.

Figure A16: Firm-level outcomes by parental income ranks and by parental entrepreneurial background

Notes: The figure shows firm-level outcomes by parental income distributions and by parental entrepreneurial background. The income ranks are calculated using the average of annual household income when the parents were 45–50 year old. Parents are classified as entrepreneurs if they are labeled as a business owner for at least 5 years according to the socio-economic status defined by Statistics Finland. In Panels A-E, the outcomes are in log scale and are observed ten years after the firm was established. Panel F presents the probability to have R&D investments during the first ten years of the firm's lifespan.

Figure A17: Average market income trajectories when accounting for retained earnings
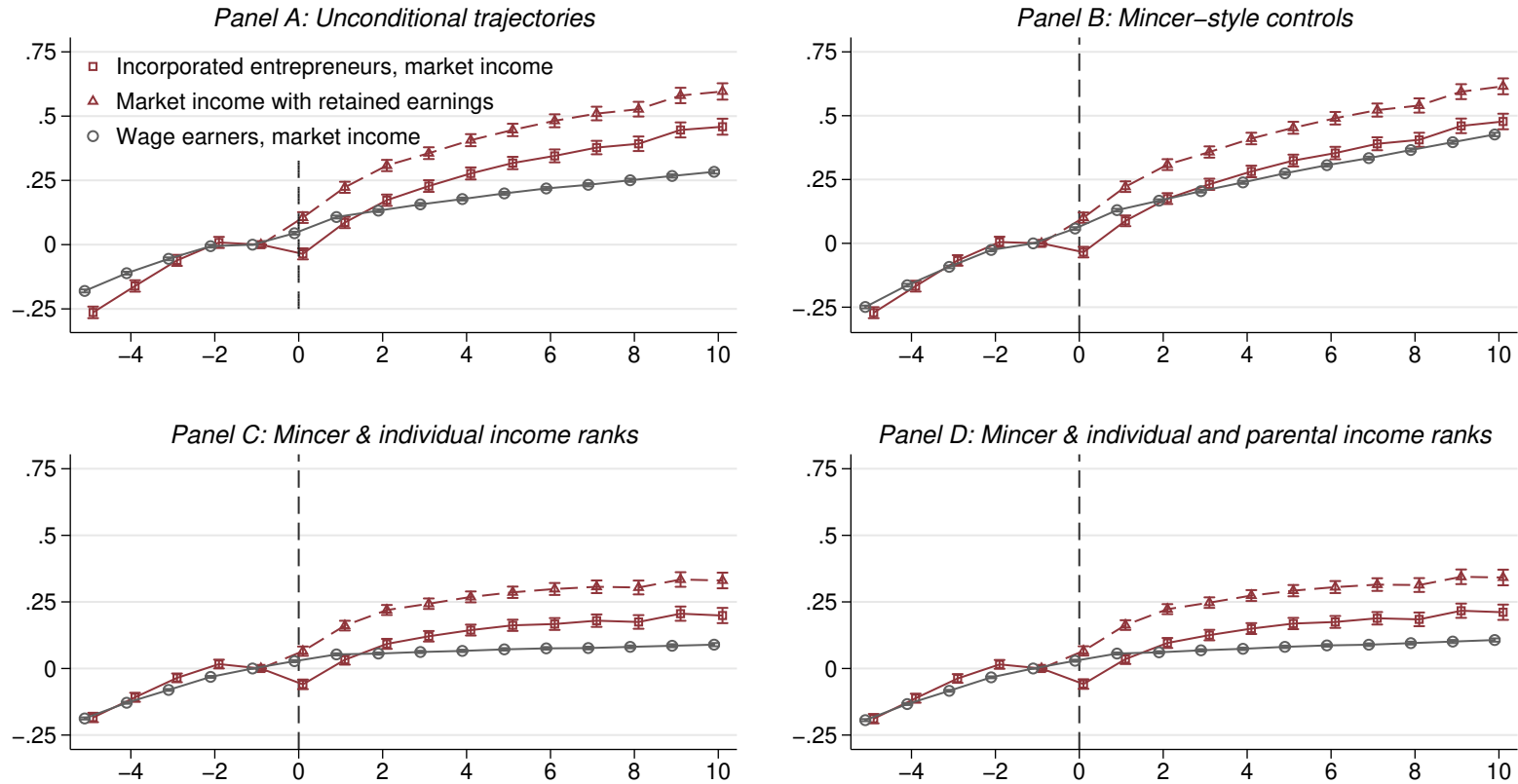
Notes: The figure presents the market income + retained earnings trajectories for incorporated entrepreneurs and wage earners before and after the business was established ($t = 0$), relative to the year $t - 1$ (denoted by zero in the figure). Retained earnings include the share of annual retained earnings of the firm allocated for each owner using their ownership share of the firm. For wage earners, pseudo-starts are drawn from a uniform distribution. The Mincer-style controls include all interactions of age, sex and education (primary education, secondary degree or tertiary degree) and the interactions using age squared and age cubed. Individual income ranks are measured at $t - 1$ from the full distribution including both wage earners and business owners in our baseline sample. Parental income ranks are calculated using the average of annual household income when the parents were 45–50 year old.

# Figure A18: Gains in market income by individual and parental income ranks
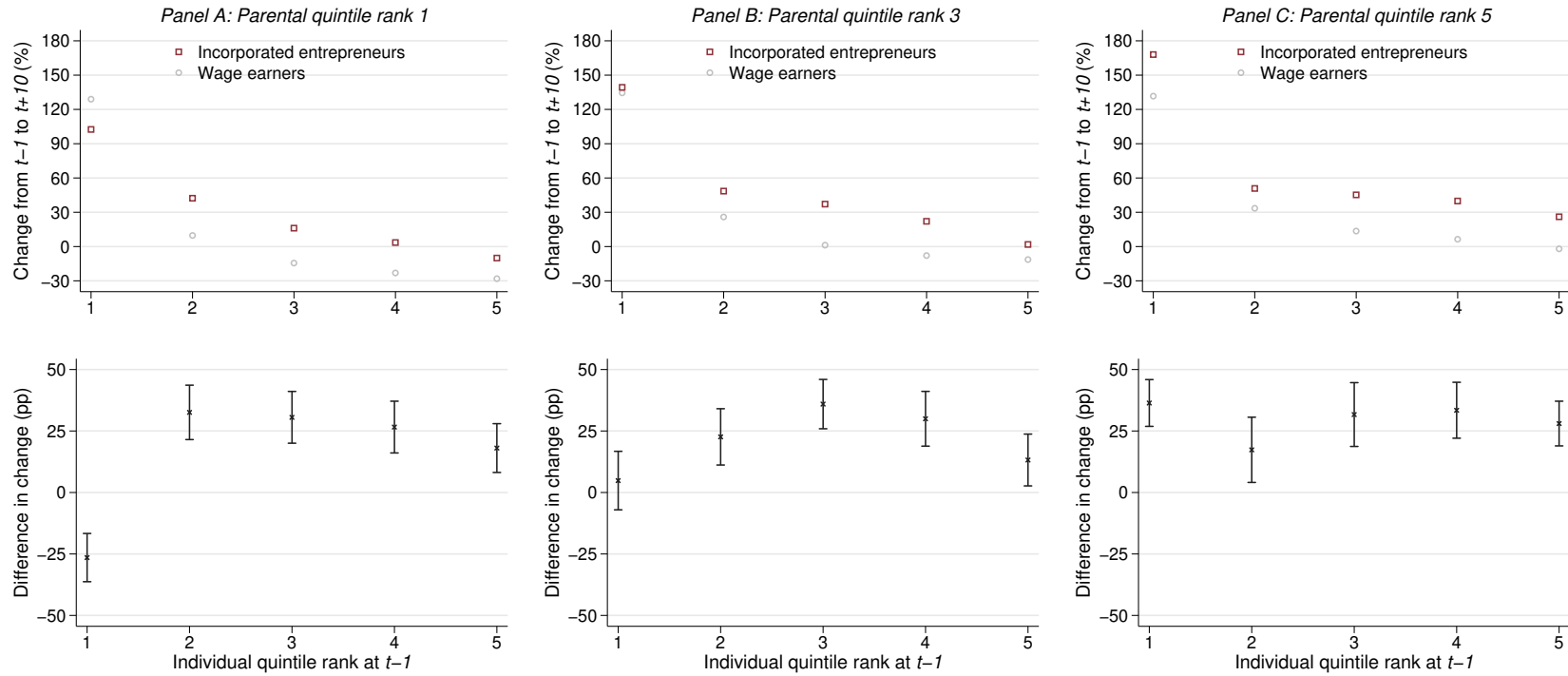
Notes: The figure shows the monetary gains in market income from incorporated entrepreneurship compared to wage earners by individual and parental income rank deciles. The left-hand side panel shows the percentage gains between ten years after $(t+10)$ and one year before $(t-1)$ the business was established for those located in the first quintile of parental income distribution by different individual income in $(t-1)$ (horizontal axis). The middle and right-hand side panels show similar figures for individuals in the third and fifth parental income quintiles, respectively

Figure A19: Gains in market income when accounting for retained earnings by individual and parental income ranks
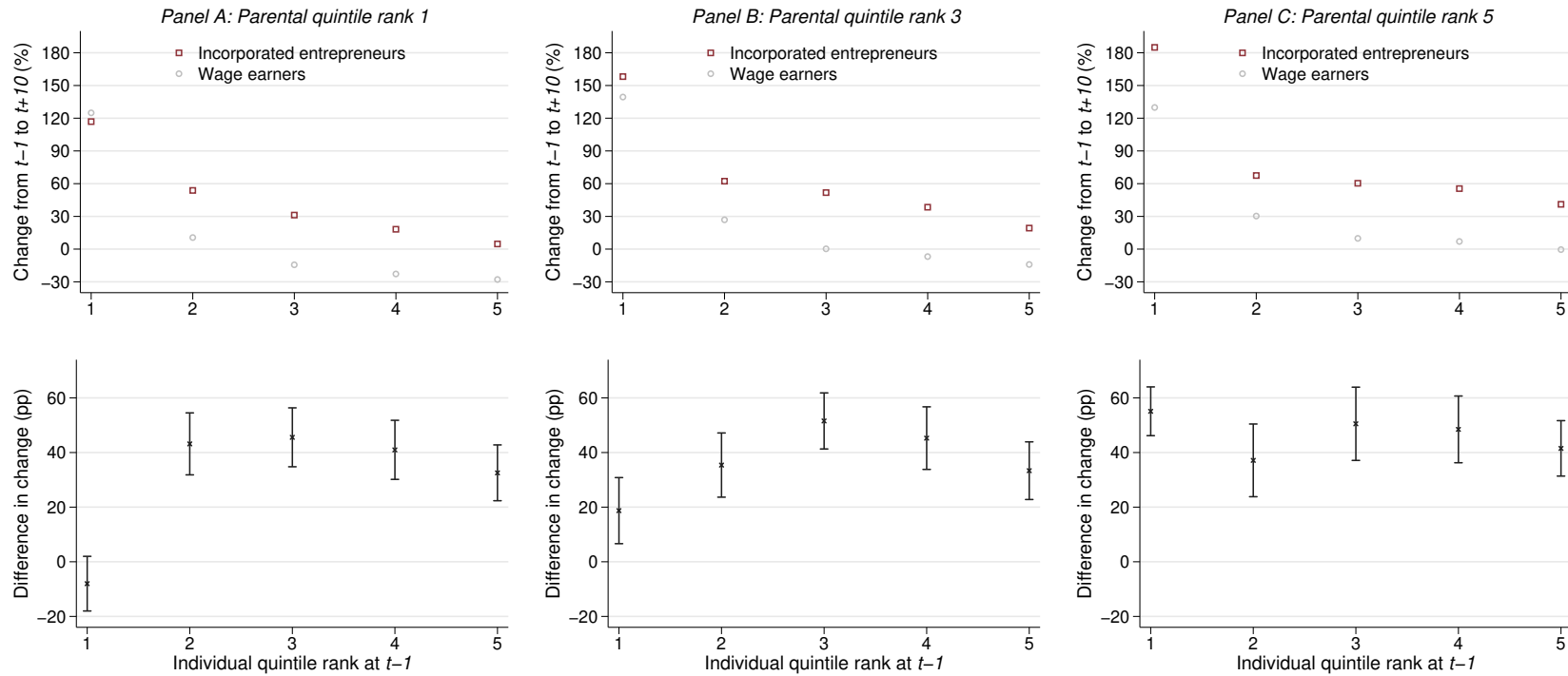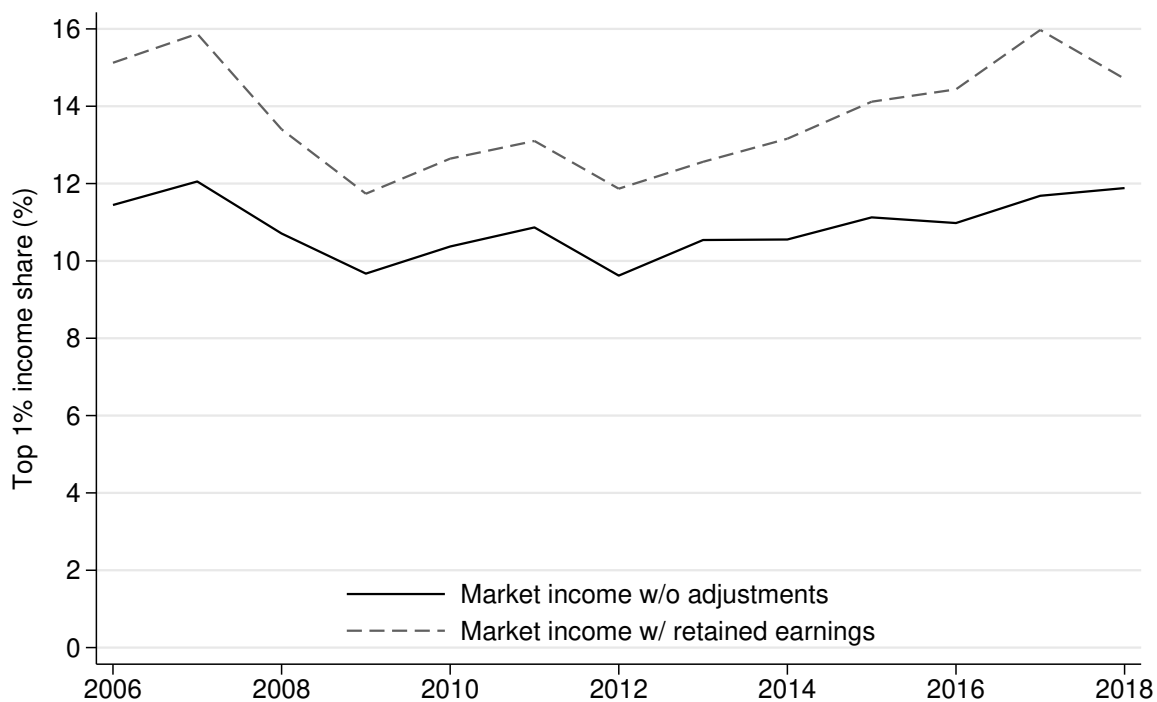

Notes: The figure shows the monetary gains in market income when accounting for retained earnings from incorporated entrepreneurship compared to wage earners by individual and parental income rank deciles. The left-hand side panel shows the percentage gains between ten years after $(t+10)$ and one year before $(t-1)$ the business was established for those located in the first quintile of parental income distribution by different individual income in $(t-1)$ (horizontal axis). The middle and right-hand side panels show similar figures for individuals in the third and fifth parental income quintiles, respectively

Figure A20: Composition of market income sources by income percentiles when accounting for retained earnings
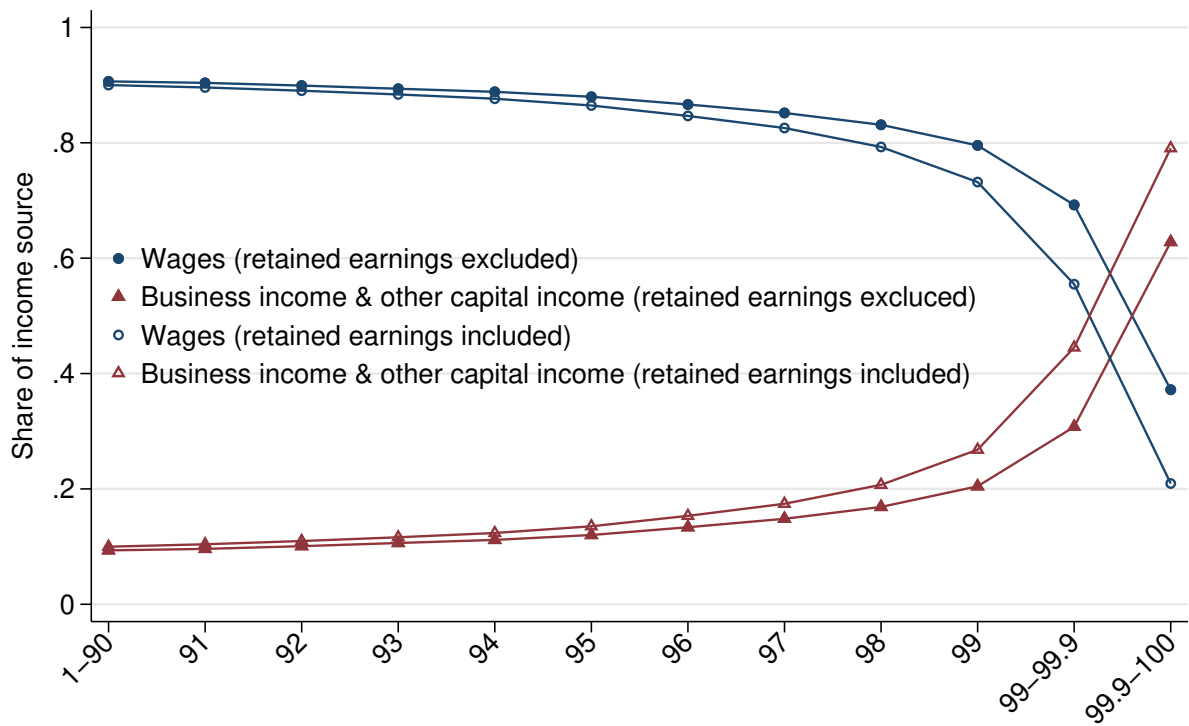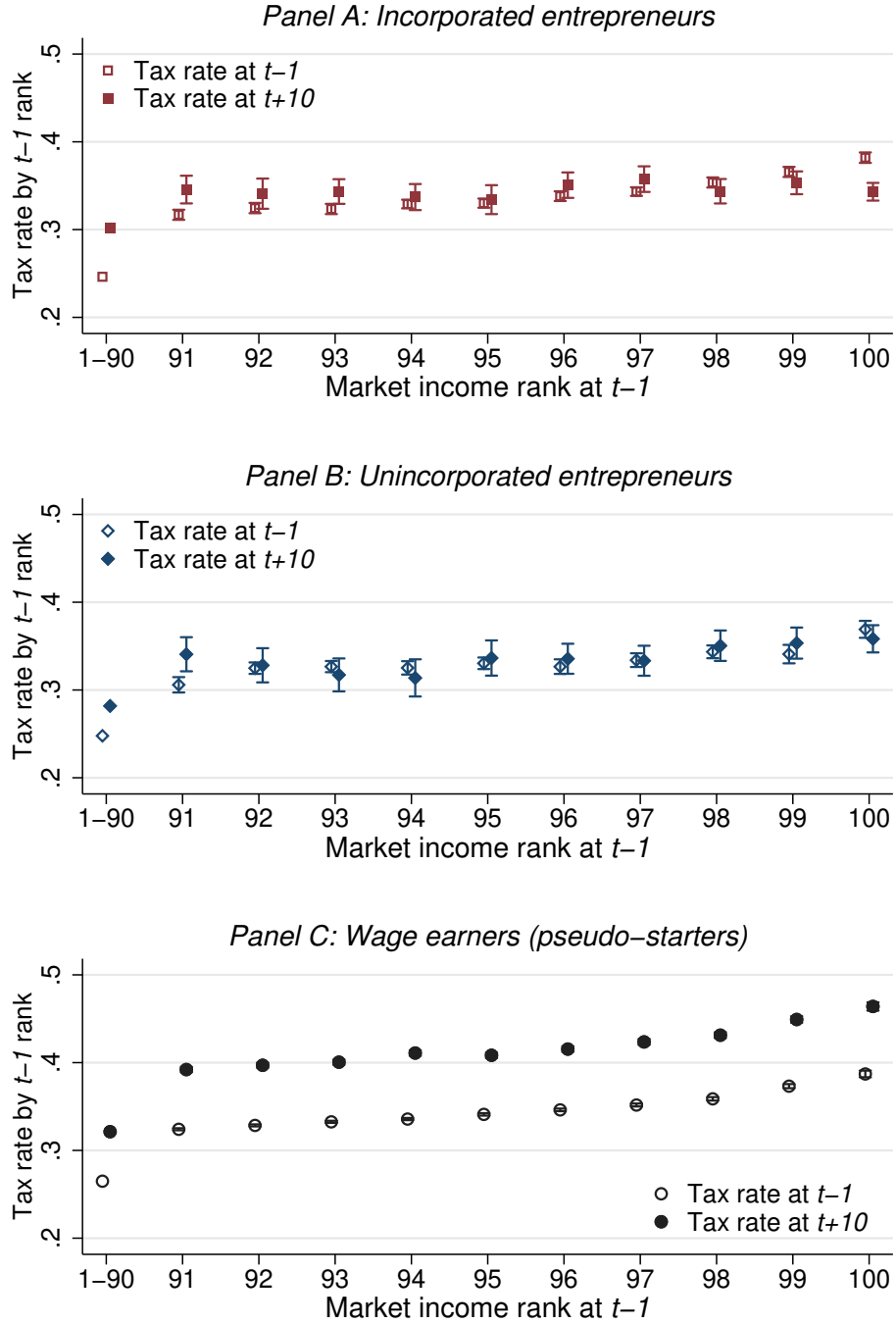

Notes: The figure plots the income composition between wages and business income + other capital income in the top 10% of the market income distribution for the full population of Finnish individuals over 16 years of age. In addition, the figure includes the income shares when including to business income the annual retained earnings of the firms divided to each firm owner based on their ownership share of the firm.

Figure A21: Top 1% market income shares when accounting for retained earnings

Figure A22: Tax rates at $t-1$ and $t+10$ by $t-1$ income ranks


Notes: Figure plots total taxes paid by individuals to their market income by market income ranks. We label this ratio as a "tax rate". Bracket 1–90 corresponds to average in the bottom 90% of the distribution.

Figure A23: Disposable income trajectories by industry of the newly established firm
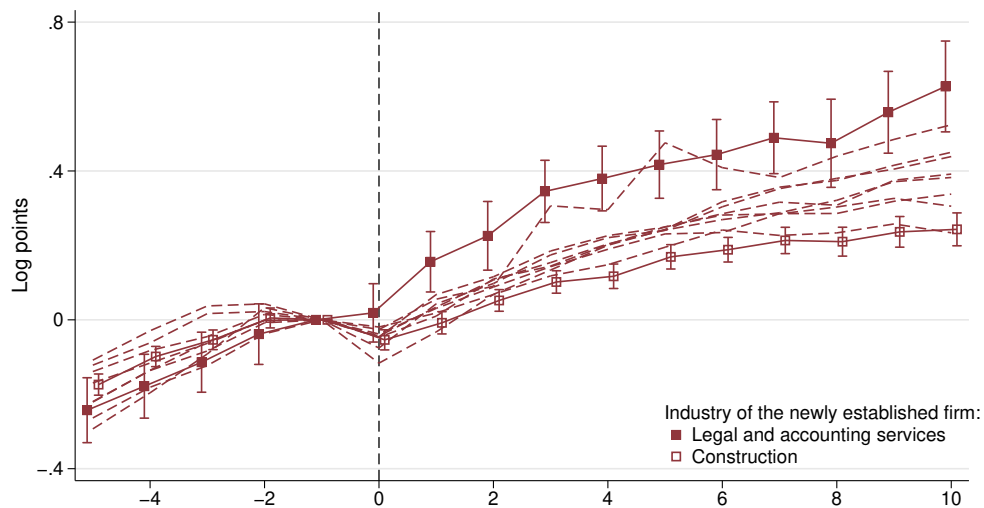
Notes: The figure presents the unconditional disposable income trajectories of incorporated business owners by the industry of the newly established firm before and after the business was established ($t = 0$), relative to the year $t-1$ (denoted by zero in the figure). Using a coarse classification, we highlight the industries where the new business owners experience the highest (legal and accounting services) and lowest (construction) gains. The industries that fall between these two, ranked from the second highest to the second lowest, are the following: finance and insurance, wholesale and retail trade, health services, architectural and engineering services, other than the specified ones, manufacturing, management consulting, and restaurants and accommodation.

Figure A24: Disposable income trajectories using a balanced panel of individuals
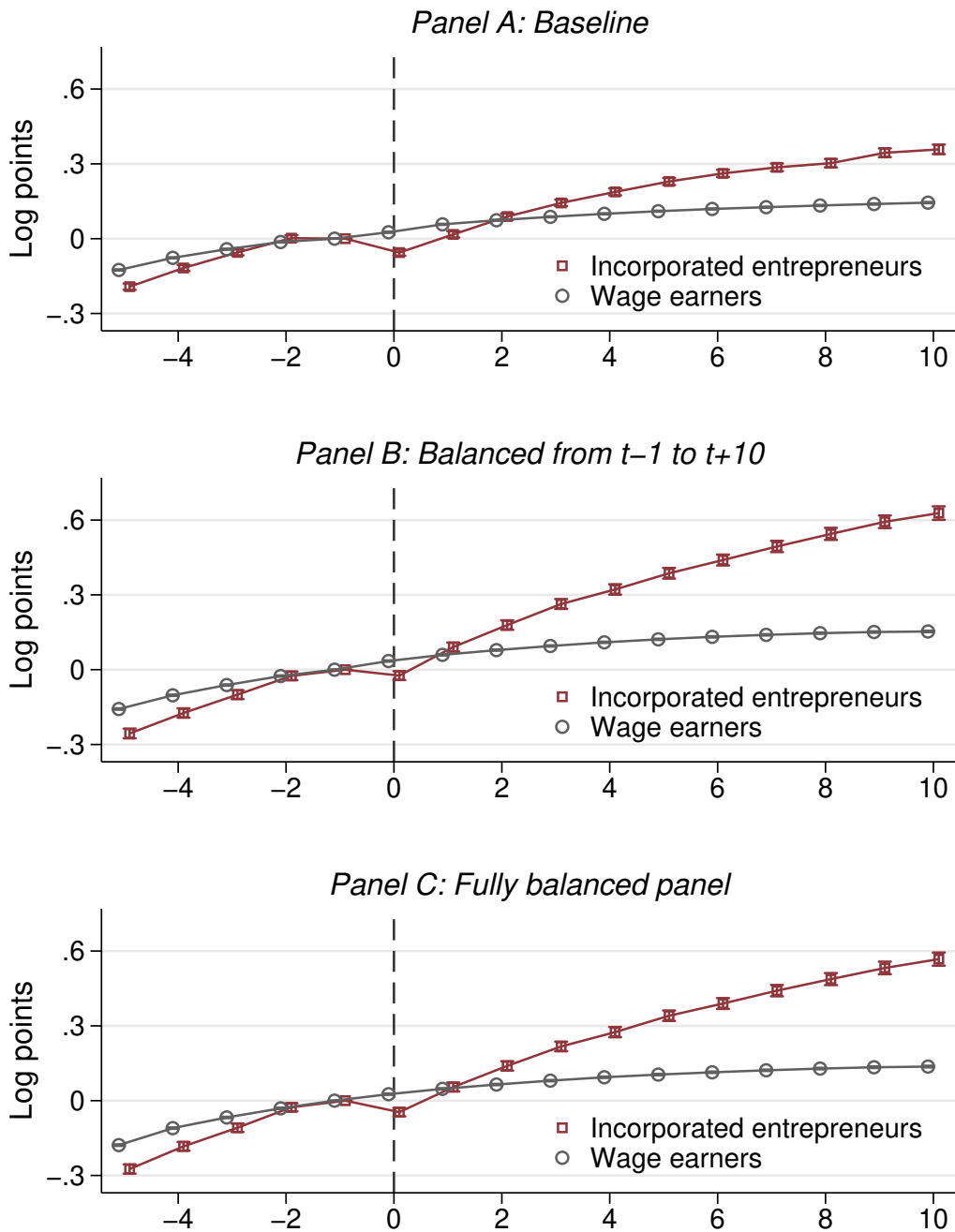
Notes: The figure presents the unconditional disposable income trajectories of incorporated business owners using three samples. The trajectories are shown before and after the business was established ($t = 0$) or a wage earner was assigned a pseudo-start, relative to the year $t-1$ (denoted by zero in the figure). Panel A shows our baseline result to facilitate comparison. In Panel B, only individuals observed from $t-1$ to $t+10$ are included, whereas Panel C shows the trajectories for individuals observed from $t-5$ to $t+10$.

B   Taxation of incorporated and unincorporated firms

Sole proprietors and partnerships are pass-through entities, meaning that their profits are taxed only at the owner level as personal income. In contrast, privately held corporations are separately tax-liable, meaning that their profits are taxed at the firm level according to the corporate tax rate. Owners of privately held corporations pay an additional tax on the income withdrawn from the firm.

Finland applies a dual income tax system where earned income (wages,pension income etc.) and capital income (interest income, rental income, dividends, capital gains etc.) are taxed with separate tax schedules. The earned income tax rate schedule is more progressive with a higher top tax rate of approximately 55%, whereas the tax rate for capital income is 30% for income below 30,000 euros and 34% for income that exceeds that threshold.

Within the dual income tax system, the declared profits of unincorporated firms are simply divided into earned income and capital income components based based on the net assets of the firm (assets minus liabilities), such that the amount corresponding to 20% of the net assets is taxed as capital income and any remaining profit as earned income of the owner.The owners can also choose a smaller capital income component of either 10% or 0%. These choices can be preferable for unincorporated firms with small profits in which case the earned income tax rate of the owner(s) can be below the personal capital income tax rate (30% or 34%).

The tax schedule for incorporated firms is more complex. Privately held corporations pay a 20% tax on profits, and the owners pay the earned income tax for any wage income withdrawn from the firm (wages are deductible from firm profits). In addition, corporations can distribute dividends to their owners, which are in general taxed as personal capital income of the owner. However, the dividend income tax schedule for privately held corporations is more complicated, including one further tax rate kink determined by firm-level net assets (8% of net assets) and another kink based on the euro amount of the dividends withdrawn from the firm (150,000 euros). The tax rate increases for dividend income that exceeds these thresholds, which are set to suppress the incentives to minimize personal income taxes by shifting income from the earned income tax base to the more leniently taxed capital income tax base

In more detail, the tax rate for dividend income that falls below the amount corresponding to 8% of firm net assets is taxed at a flat effective tax rate of 26%, including both owner-level dividend taxes and corporate taxes. This dividend income is 75% tax-free, and 25% is taxed as personal capital income. Combined with the corporate tax of 20%, this yields an effective tax rate of 26% (0.20+(0.8*0.25*0.30)=0.26). The rate increases to 26.8% if the annual

personal capital income of the owner exceeds 30,000 euros. The tax rate increases to 40.4% (43.1% if capital income above 30,000 euros) for dividends below the net assets threshold that exceed 150,000 euros. Dividend income that exceeds the 8% net assets threshold is partly tax free (15%) and partly taxed as earned income (85%) according to the progressive wage tax schedule excluding social security contributions. The exact tax rates and thresholds have varied over time in the time period we study, but the baseline system has remained the same. See Harju et al. 2022 for details on the recent reforms and Harju and Matikka 2016 more details on the dividend taxation of privately held corporations.

C Definitions

Estimation Sample: We restrict our baseline sample to individuals who are 25–64 years when establishing their business and to individuals with positive annual wage income and/or entrepreneurial income. We also restrict our main sample to those individuals for whom we observe child-parent links. This last restriction eliminates all individuals born before 1953. We analyze firm starts and pseudo-starts (see wage earners below) that take place 1998–2014. In Section 6, we also analyze the entire Finnish population of adults and clearly state when doing so.

Incorporated entrepreneurs: Main owners of newly established privately held corporations. An individual is classified as an incorporated entrepreneur when the firm shows positive turnover if an individual had no prior ownership in other privately held corporations. Data on full ownership information starts from 2006 and is from the Finnish Longitudinal Owner-Employer-Employee Data (FLOWN). The information is collected annually with the Finnish Tax Administration's form 6B and supplementary form 72. For the period 1997–2005, we rely on data from the Finnish Tax Administration that cover owners who received dividend income from their firm. In Section 6, we also analyze the entire pool of incorporated business owners and clearly state when doing so.

Unincorporated entrepreneurs: Sole proprietors or main owners of newly established partnerships. An individual is classified as an unincorporated entrepreneur when the firm shows positive turnover and the owner derives the majority of their annual earnings as business income if an individual had not been a sole proprietor before and had no prior ownership in other partnerships. The ownership data start from year 1997 and are from the Finnish Tax Administration.

Wage earners: Individuals that are 25–64 years, have positive wage income and do not engage in any business activities are assigned a pseudo-start (drawn randomly from a uniform distribution).

Disposable income: Sum of earned income, entrepreneurial income, capital income and current transfers received after taxes and other levies.

Market income: Sum of earned income, entrepreneurial income and capital income.

Market income with retained earnings: Sum of earned income, entrepreneurial income, capital income and the residual between profits and dividends of privately held corporations

proportional to the ownership share of individuals.

Income rank: Individual's position in the income distribution in a given year for a given income concept. Depending on the scope of the analysis, we use either percentile (1–100), decile (1–10) or quintile (1–5) ranks.

Parental income: Average annual household disposable income of parents when they were 45–50 year old. Parental income rank refers to household's position in the parental household distribution.

Parental entrepreneurship status: Parents are classified as entrepreneurs if at least one of the parents is labeled as a business owner for at least 5 years according to the socioeconomic status defined by Statistics Finland. This approach enables us to use a similar definition for parental entrepreneurship using our full data starting from 1987 as the detailed ownership data starts only from 1997.

Education: The educational level and field of the highest qualification/degree. Based on the education code, according to Statistics Finland's latest education classification, which is comparable over time. Correspond to the ISCED 2011 Classification.

Income trajectory: Individual-level income development five years before and ten years after the start as an entrepreneur or pseudo-start. Based on equation (1).

Binned scatterplots: We express the income development across the individual and parental income distributions (decile or quintile ranks) as the difference between income ten years after and one year before the start as an entrepreneur or pseudo-start. In practice, this involves including rank dummies interacted with the event timeline in equation (1) and collecting estimates for event times $t = 10$ and $t = -1$.

Rank-rank correlation: We measure intergenerational mobility also in terms of the correlation between parents' and children's disposable income. We calculate the correlations one year before and ten years after the start as an entrepreneur or pseudo-start. We control for the age of the child to account for the positive correlation between individual income and age.

Firm entry: First year of a business is defined as the first year it is both registered at the Finnish Patent and Registration Office and shows positive turnover. Suppose a firm is registered in 2010, but has a positive turnover only in 2011. First year of business would be

2011.

Firm ownership: For the owners of privately held corporations, we use two separate data sets: 1) the main owner information from the Tax Administration for those owners who received dividend income from their firm, available from 1997–2016, and 2) the full ownership database from Statistics Finland, which is based on information from the Finnish Patent and Registration Office, available from 2006–2019. We use a data set including all sole proprietors and partnership owners from the Tax Administration available from 1997–2016. We define individuals as entrepreneurs solely based on starting a new business with no conditions on how long the business survives.

Turnover: Sales income from products and services belonging to the enterprise's operations proper from which any granted discounts, value added tax, and other direct taxes based on sales volume have been deducted.

Number of employees: Full-time equivalent data. Generated based on wages and salaries if not available from direct inquiry.

Staff costs: The sum of wages, salaries and personnel expenses determined directly on the basis of the wage or salary, such as pension expenses, social security contributions, statutory and voluntary personal insurance contributions.

Value added: The sum of revised operating margin, wages, salaries and other personnel expenses.

Productivity: Value added divided by the number of employees.

R&D: Annual investments in research and development.