

**Direction des Études et Synthèses Économiques**

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in France, 1945-2014**

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**Document de travail**



**Institut National de la Statistique et des Études Économiques**



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## Les contraintes financières et l'entrepreneuriat en France de 1945 à 2014

### Résumé

Dans cet article, nous étudions l'effet de chocs de patrimoine sur les probabilités de transition entre salariat et entrepreneuriat, et l'évolution de cet effet au cours du temps sur la période 1945-2014 en France. Nous évaluons cet effet de deux manières : (i) en estimant si les salariés ont de plus grandes chances de s'installer à leur compte à la suite d'un héritage plutôt que dans les années qui le précèdent, et (ii) en comparant les taux de transition vers le travail indépendant des individus locataires et propriétaires de leur logement, selon que leur région de résidence a connu une variation plus ou moins forte des prix de l'immobilier. Ces deux stratégies d'estimation donnent des résultats convergents qui montrent que pour les hommes, l'effet d'un choc de patrimoine sur la probabilité de devenir travailleur indépendant a beaucoup décru au cours du temps ; il était significatif jusqu'au milieu des années 1990, mais ne l'est plus depuis. Pour les femmes, nous ne détectons aucun effet, à aucun moment. Nous proposons plusieurs pistes d'interprétation de ces résultats.

**Mots-clés** : contraintes de crédit, entrepreneuriat, régulation financière

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## Financial Constraints and Self-Employment in France, 1945-2014

### Abstract

This paper studies the evolution over time of the effects on entry and survival into self-employment of inheritance receipt and real estate price variations. We focus on France over the period 1945-2014, and we estimate these effects by comparing (i) current inheritors with future inheritors and (ii) homeowners without a mortgage outstanding to renters or to those with a mortgage outstanding, for whom home equity extraction is not possible in France. Our main finding is that the effect of both wealth shocks on men's entry into self-employment has decreased over time; we find no significant effect of either wealth shock since the mid-2000s. We discuss potential causes for this trend, including changes in the financial regulation and in the sectoral composition of the economy. We also find no evidence of an effect of wealth shocks on women's entry into self-employment, at any point in time.

**Keywords**: self-employment, credit constraints, inheritance, collateral channel

**Classification JEL** : L26, D31, G21, N24

# 1 Introduction

The existence of financial constraints is often cited by prospect entrepreneurs as one of the main obstacles to the creation of a new business.<sup>1</sup> How important financial constraints really are for firm creation is a key question. Theoretical works have suggested that the existence of financial constraints not only has a negative impact on individual probabilities of business creation, but also has long run consequences on the aggregate share of entrepreneurs in the economy, capital accumulation, growth, and several other macroeconomic outcomes.<sup>2</sup> This issue also has deep policy implications. The idea that the creation of new firms may be constrained by access to external financing has long provided a basis for government intervention in the fields of financial regulation and support to small businesses, for example through the implementation of loan guarantee programs.<sup>3</sup>

An important body of research has documented that the likelihood of entry into self-employment is positively related to an individual's wealth, suggesting that collateral facilitates firm creation.<sup>4</sup> The recent literature on this subject has also made important progress in assessing whether the link between wealth and entry into self-employment is causal, by relying on sources of exogenous variations of wealth such as the receipt of an inheritance or variations in real estate prices.<sup>5</sup> However, this literature has not yet reached a consensus on the magnitude of the effect of wealth shocks on entry into self-employment, nor on whether this constitutes evidence of ill-functioning capital markets: while some papers find that firms created after an exogenous increase in an individual's wealth perform worse than others, other works find the opposite or sometimes no significant differences between both types of firms. These diverging results may be caused by differences in the empirical strategies developed in these works, but they could also be due to differences in the institutional and economic contexts surrounding the estimations. This question is crucial from a policy standpoint, but it has received little attention in previous works.

This paper attempts to shed some light on this issue by estimating the effect of wealth shocks on entry and persistence into self-employment using consistent empirical strategies in a single country over a long period of time. We focus on France over the period 1945-2014, and we implement two distinct empirical strategies. In our first strategy, we estimate the effect over

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<sup>1</sup>Blanchflower and Oswald (1998)

<sup>2</sup>See e.g. Quadri (2000); Cooley et al. (2004); Cagetti and Nardi (2006); Buera and Shin (2013).

<sup>3</sup>Examples of such programs include the 7(a) loan program of the Small Business Administration in the US, or the Sofaris guarantee in France. In both of these programs, a publicly-funded entity offers a guarantee backing loans to small businesses issued by private lenders.

<sup>4</sup>See e.g. Evans and Leighton (1989); Evans and Jovanovic (1989); Johansson (2000)

<sup>5</sup>See e.g. Holtz-Eakin et al. (1994); Lindh and Ohlsson (1996); Hurst and Lusardi (2004); Disney and Gathergood (2009); Andersen and Nielsen (2012); Arrondel et al. (2014); Schmalz et al. (2017).

time of inheritance receipt on the transition to self-employment since 1945. Building on the retrospective information available for respondents of the French Wealth Survey, we are able to compare the probabilities of transition to self-employment for individuals who just received an inheritance and for those who will receive one in the next few years. Doing so enables us to overcome the usual issue that inheritors may differ from other individuals on some time-invariant unobservable characteristics which are correlated to entry into self-employment. In our second strategy, we estimate the effect over time of real estate price variations on the transition to self-employment of homeowners compared to renters. We largely follow a recent paper by Schmalz et al. (2017) who focus on the period 1992-2002, but we extend the analysis to a 40-year period (1975-2014).

We first focus on men and estimate the effect of inheritance receipt on their entry into self-employment for each 10-year period since 1945. For each period from 1945 to 1994, we find that salaried men are significantly more likely to become self-employed on the year of receipt of their inheritance than in the preceding five years. However, our results show that the magnitude of this effect decreases over time: while inheritance receipt coincides with an average threefold increase in the rate of entry into self-employment over the years 1945-1964, it only induces an increase of about 80% in this rate over the years 1985-1994. By contrast, we find that for later periods individuals are no more likely to become self-employed on the year of receipt of their inheritance than in the preceding five years. We then estimate the effect of real estate price variations on the difference between the rate of entry into self-employment of homeowners and renters, for each 10-year period since 1975. This analysis leads to similar conclusions: compared to renters, homeowners are on average four times more likely to become self-employed in regions which experienced a doubling of housing prices over 5 years in the years 1975-1984, but this effect is cut by half over the period 1985-1994 and is not statistically significant for later periods.

Next, we explore whether these results carry over to women. One of the most striking changes over the 1945-2014 period is the rise in the share of women among individuals who enter self-employment each year. In addition, a growing literature highlights differences both in banks' lending practices towards women and in women's demand for capital. This calls for a separate investigation of the effects of wealth shocks on women's entry into self-employment. When we reproduce the previous analysis on the sample of women, we find no significant effect of inheritance receipt or real estate price variations on their rate of entry into self-employment, at any point in time. The effect of wealth shocks on women's rate of entry into self-employment is also significantly lower than the effect on men. These results suggest that women's entry into

self-employment is not primarily restricted by access to capital.

Given this finding, we focus on men in the remainder of the paper. Results for men indicate that over the period 1945-1994, a fraction of individuals were unable to become self-employed before receiving additional wealth, which may suggest that they were facing difficulties in securing external sources of financing through banks or capital markets.<sup>6</sup> Under the assumption that capital markets are well-functioning, these self-employed should carry projects of lower quality than those which are able to secure external funding. We test this hypothesis by estimating whether men who become self-employed after receiving an inheritance stay self-employed longer than other self-employed individuals. Over the years 1945-1994, we find no difference between the length of the self-employment spells of both population. During the period 1975-1994, we also find no evidence that self-employed homeowners have higher chances of staying self-employed than self-employed renters in regions with high real-estate price increases.

In the last part of this paper, we discuss and test possible causes for the decrease over time of the effect of wealth shocks on men's entry into self-employment. This decrease could be due to a decline over time in initial capital requirements for new ventures, or it may reflect changes in the availability of external financing. First, we investigate whether initial capital requirement might have decreased over time due to changes in the sectoral composition of new ventures and in particular the rise of the service sector and the decline of agriculture. As it turns out, when we re-estimate our models excluding transitions to self-employment in those sectors, we still find a decline. Finally, we explore whether changes in the financial regulation which took place in most of the developed world over this period can help explain the decline in the effect of wealth shocks over time (see e.g. Abiad and Mody (2005)). To do so, we propose a quantitative review of the previous literature; for all previous works, we compute standardized estimates of the relative increase in the rate of entry into self-employment after the receipt an additional €10,000 whenever possible. We find that there is a significant negative correlation in the previous literature between the magnitude of the standardized effect and a synthetic indicator for financial liberalization constructed from several regulatory criteria by the IMF (Abiad et al. (2010)). This finding is consistent with the idea that financial liberalization has made it easier for individuals to access external sources of financing.

This paper contributes to several economic literatures. First, we contribute to the literature on the effect of financial constraints on firm creation. Previous works in this literature have

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<sup>6</sup>Other interpretations are possible for this finding ; for example, individuals may be have been reluctant to enter credit deals for various reasons (e.g. the psychological impact of being "in debt"), and this reluctance may have faded over time. We do not explore these hypotheses in this paper.

used different sources of variation of private wealth to estimate the effect of wealth shocks on entry into self-employment, such as the receipt of an inheritance (e.g. Holtz-Eakin et al. (1994)), variations in real-estate prices (e.g. Adelino et al. (2015)) and lottery gains (Lindh and Ohlsson (1996)). Debate has been ongoing about which of these shocks constitutes the purest source of identification. While Hurst and Lusardi (2004) have argued against using the receipt of an inheritance on the grounds that inheritors may have different unobserved characteristics which may in turn be correlated to entrepreneurial propensity, Andersen and Nielsen (2012) have argued that this issue can be alleviated by comparing current inheritors with future inheritors. A first contribution of this paper is to show that doing so produces results which are very comparable to those obtained when building on house price variations. Another paper close to ours is Schmalz et al. (2017); while they use variations in real-estate prices to estimate the effect of wealth shocks on transition to self-employment over the period 1992-2002, we extend their work to both older and more recent periods. The second contribution of our paper is to show that while the effects of financial constraints on firm creation were indeed strong and significant in the past in France, they have decreased and seem to vanish for recent years. In doing so, we also contribute to the literature on the effects of financial liberalization on the real economy. In France, Bertrand et al. (2007) found that the deregulation of the French banking industry had large effects on industry structure. In the US, Black and Strahan (2002) found that banking deregulation led to a large increase in firm creations. While these papers provide causal estimates of the short run effects of financial regulation on economic outcomes, we show that these effects are consistent with long term trends observed in France over the past 70 years.

Finally, our paper also contributes to the growing literature on gender differences in entrepreneurship and self-employment. Several papers have found evidence that female-run businesses are less likely to obtain bank loans than male-run firms, but causal evidence on this issue is scarce.<sup>7</sup> We challenge these findings by providing causal evidence that women are no more likely to enter self-employment after receiving a positive wealth shock.

## 2 Data

We use three sources of data: the Wealth Survey, the Labor Force Survey and the Housing Survey. The Wealth Survey contains recall data useful to analyze the impact of inheritance on transition to self-employment. The Labor Force Survey contains information on home ownership

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<sup>7</sup>See e.g. Muravyev et al. (2009) or Mijid (2015).



status and labor force participation status that permits implementing the second strategy relying on real-estate prices shocks. Finally the Housing Survey contains real estate-prices needed for this second strategy.

## 2.1 Wealth Survey

Our first data source is the French Wealth Survey (*Enquête Patrimoine*). The Wealth Survey is conducted by the French statistical office every 6 years since 1986 (every 4 years since 2010) on a sample of about 15,000 households.<sup>8</sup> The sample is renewed entirely at each wave.<sup>9</sup> We pool data from the years 1998, 2004, 2010 and 2014.<sup>10</sup> Those surveys provide detailed information on the main socio-economic characteristics of the members of the households, and on the composition of all of their assets, including any firms owned at the time of the survey. Respondents provide additional information on these firms (if any) such as the date of acquisition and whether they were acquired through inheritance, bought from a previous owner, or created by the individual. In addition, respondents are asked to report the main career changes over their life, such as any interruption of activity, or any change of labor force status (e.g. from salaried to self-employed) along with the year at which these changes occurred. Individuals are also asked whether they received any inheritance at some point in their lives. For each inheritance received they then provide the year at which they received it as well as the person from whom they received (a parent or a more distant relative), the amount and the nature of the inheritance (cash, real estate, ...).

From this information, we build a database containing one observation for each year lived by each individual (i.e. for each individual, years between the reported birth year and the year of the interview). This new database contains time-invariant variables (e.g. household socio-demographic variables at the time of the interview) as well as time-varying variables such as a dummy variable indicating whether the individual was self-employed in a given year, a dummy indicating inheritance receipt in that year as well as the amount inherited, etc. For each period

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<sup>8</sup>Since 2010, this survey is part of the Household Finance and Consumption Survey (HFCS) which collects information on the assets, liabilities, income and consumption of households in euro area countries as well as Poland and Hungary.

<sup>9</sup>The Wealth Surveys over-sample households at the top of the distributions of income and wealth. The French statistical office provides sample weights designed to ensure the representativeness of the sample on the year of the survey. We do not use these weights in our regressions because our analysis builds on the retrospective information available for individuals in those surveys; sample weights are not designed to ensure representativeness in this dimension.

<sup>10</sup>We do not use the first two waves of the survey (1986 and 1992) because the questions on labor market transitions which are crucial to our analysis were asked with less details and in a different way that does not make answers comparable to later waves of the survey.

of self-employment over the individuals' life, we are also able to know whether the individual was working in a firm he still owns at the time of the survey. We select observations corresponding to salaried or unemployed individuals aged 20-64. We exclude individuals living in households where one of the member declares having inherited a firm or any business-related asset.

In section 3, we describe some of the evolutions that took place since the 1950s in the nature of self-employment, and we show that a major change occurred over this period for women. Until the 1970s most self-employed women and some self-employed men were actually working in their spouse's business (we refer to them as "assisting spouses"), while this proportion has been much lower since the 2000s. We exclude assisting spouses from our definition of the self-employed because their activity effectively depends on another business. This is possible to implement in practice in the wealth survey because "assisting spouse" and "self-employed" are distinct labor force statuses in the questionnaire.

## 2.2 Labor Force Survey

Our second data source is the French Labor Force Survey (LFS, *Enquête Emploi*), which is conducted every year since 1950 by the French statistical office (Goux (2003)). The individual data files are available since the wave of 1968, but the homeownership status of respondents which is crucial for our analysis is known for all individuals only since 1975. We pool data from the survey waves of 1975 to 2014. Since 1975, the survey underwent several minor questionnaire changes in 1982, 1990 and 2013, as well as a major renovation in 2003. Before 2003 the survey was conducted annually in March on a sample of about 60,000 households.<sup>11</sup> Dwellings were interrogated for 3 consecutive years and the sample was renewed by thirds every year. Since 2003 the survey takes place continuously over the year on a sample of about 50,000 households per quarter. Dwellings are interrogated for 6 consecutive quarters and the sample is renewed by sixth every quarter. All waves of the survey provide information on respondents' socio-demographic characteristics such as their age, activity status, profession and status in the profession (salaried or self-employed). In addition, the surveys provide information on the geographical location of respondents and on the ownership status of their home. When individuals own their home they also report whether they still have a mortgage outstanding. We select observations corresponding to salaried or unemployed individuals aged 20-64 who are reinterrogated in exactly one year (or

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<sup>11</sup>Between 1977 and 1981, a second survey was conducted in October with a similar design, independently of the March survey. We do not use this data.

4 quarters after 2003).<sup>12</sup> Our main outcome variable is a dummy indicating that individuals are self-employed during their reinterrogation (excluding assisting spouses).<sup>13</sup>

## 2.3 Housing Survey

We use data from the Housing Survey (*Enquête Logement*) to construct house price series since 1967 for five regions of France. The Housing Survey is conducted by the French statistical office at irregular time intervals (every 3 to 6 year) since 1955. We pool data from all waves of the survey since 1970, the first year on which the data files are available. In each wave the survey provides information on the detailed characteristics of the dwelling of the respondents, such as the number of rooms, living floor space, and geographical location. In addition, the subsample of individuals who bought their home since the year of the previous survey are asked to report the price of purchase of their house. Appendix table A1 provides a list of the waves of the housing survey along with the period during which home purchase prices are known in each survey. In the surveys of 1984 and 1988, the question on purchase price was asked to additional individuals, namely those who had bought their house since 1975 and 1967 respectively. On the other hand, fewer individuals were asked about the purchase price of their home in the 1978 and 2013 survey. In the 1978 survey, individuals who had bought their house in 1974 were not asked to report the purchase price. As a result we have very few observations for the year 1974, and we impute real estate prices that year by linear interpolation in each region. In the 2013 survey, home purchase prices were not available for individuals who bought between 2007 and 2009. We drop these years from the analysis.

Overall the Housing Surveys provide about 35,000 house transaction prices over the period 1967-2013 representing on average 800 transactions each year. We use this data to compute annual real estate price indices over the period for five types of territories: (i) Paris and its suburbs, (ii) urban areas with more than 200,000 inhabitants, (iii) urban areas with 20,000 to 200,000 inhabitants, (iv) urban areas with less than 20,000 inhabitants, and (v) rural areas. We choose this geographical breakdown for two reasons. The first reason is that it provides a more or less uniform distribution of observations across geographical units, so that annual

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<sup>12</sup>This corresponds to individuals living in a dwelling which is part of the first or second round of interrogation. Attrition represents about 15% of respondents between two interrogations in the LFS.

<sup>13</sup>Several concepts of self-employment are available in the Labor Force Survey. We use an indicator which is adjusted to be consistent with individuals' reported occupation. Typically, salaried CEOs who own their firm will be considered self-employed even though they perceive a wage. This is slightly different from the Wealth Survey in which the status is self-reported and not adjusted, but it ensures a better comparability between the Labor Force Surveys over time.

average house prices are computed for each unit on a sufficient number of observation (about 160 transactions).<sup>14</sup> The second reason is that the size of the urban area is an important predictor of house prices. This geographical breakdown therefore leads to a relatively low price dispersion within each unit, and a relatively high price dispersion between units. This guarantees that average house prices are estimated as precisely as possible for each unit, and that they exhibit substantial heterogeneity across units. The resulting price series are shown in Figure A1. In their paper, Schmalz et al. (2017) construct house price indices over the period 1986-2002 for 25 regions of France by combining survey data from the French Ministry of Housing and a price index constructed by the Parisian Notaries. Unfortunately neither of these two data sources are available prior to 1986, nor any other that we are aware of apart from the housing survey. The sample size of the housing survey is not sufficient to compute house price indices for these 25 regions, but we provide evidence that we obtain results that are very similar to Schmalz et al. (2017) on their period of analysis (1992-2002).

### 3 Self-employment and private wealth over time

Before moving on to the analysis of wealth shocks on entry into self-employment, we provide a brief description of the population of the self-employed in France during the period 1945-2014. Despite profound changes in the share of self-employed among the workforce and in their sectors of activity over the period, we show that the self-employed have persistently remained over-represented at the top of the wealth distribution, similar to what has been found in previous works on specific cross-sections (see e.g. Cagetti and Nardi (2006) or Parker (2009)). We also show that this holds for both men and women.

#### 3.1 Self-employment over time

To begin with, Figure 1 plots the share of self-employed in the workforce over time and by sex using the Labour Force Surveys over the period 1968-2016 and the population Censuses of 1954 and 1962.<sup>15</sup> About 31% of active men were self-employed in 1954, but the figure shows that this

<sup>14</sup>The sample of the housing survey is stratified by urban area size so as to give an equally accurate description of living conditions in less densely populated areas.

<sup>15</sup>Another census took place in 1946, but it did not make it possible to identify precisely the self-employed. More generally, the French population censuses provide information on individuals' profession since at least 1851 but the way in which this information is gathered and coded has changed greatly over the years, making it hard to compare the raw data between censuses before 1954 (Marchand and Thélot (1991)). On the other hand, the questions on individuals' profession in the censuses of 1954 and 1962 were very similar to those asked in the early labor force surveys, ensuring the comparability of both sources.

proportion fell steadily to about 12% in the early 2000s. This drop is even more pronounced for women: about 40% were self-employed in 1954, but this proportion was only about 8% in the 2000s. For both men and women, we further distinguish between the self-employed who run their own business and those who contribute to their partner’s (assisting spouses). At any point in time, very few men are in this situation: for most of the period, they represent about 1% to 2% of self-employed only. By contrast, a large part of the drop in the share of self-employed women is attributable to the fall in the share of women assisting their self-employed husband in his business. Assisting spouses accounted for about two-thirds of self-employed women in 1954 up until the end of the 1970s, while they represent only about 5% of self-employed women in 2016. When we omit assisting spouses, the decline in the share of self-employed women looks more nuanced: from about 14% of the female workforce in 1954, to 6-7% in the 2000s.

The sectors in which the self-employed work have also changed significantly over time. The share of self-employed by sector over time is shown separately for men and women in Figure 2. For men, the most substantial changes are the decline in the share of self-employed working in agriculture (from 40% in 1975 to 17% in 2016) and the rise in the share of service activities, from 19% to 42% over the same period. This rise is also visible for women: 68% of self-employed women work in service activities in 2016 whereas only 39% did in 1975. On the other hand, this period witnessed a steep decline of the share of women working in commerce, from about 33% in 1975 to 15% 2016. Overall over the period 1975-2016, self-employed men were relatively more present than women in construction and industrial activities, whereas the weight of service activities was stronger for women. These contrasts mirror those that are found for salaried workers over the same period.

### 3.2 Self-employment and private wealth

Previous works have shown that the self-employed tend to be over-represented at the top of the wealth distribution (see e.g. Cagetti and Nardi (2006) or Parker (2009)). However, the previous section has provided evidence that the nature of self-employment has evolved substantially over time, and differs for men and women. The question we explore in this section is whether these differences translate into variations in the share of self-employed at the top of the wealth distribution.

To begin with, we compute the share of self-employed individuals by wealth percentile in each wave of the Wealth Survey.<sup>16</sup> Since the Wealth Surveys only report wealth at the household level,

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<sup>16</sup>Although the first Wealth Survey took place in 1986, other data is available before this date. A first large-

we only consider the reference person in each household in this analysis. Table 1 reports these shares for the top 1%, 5%, 10% and 20% of the wealth distribution as well as for the whole population. The table shows that households with a self-employed person of reference are over-represented to some degree at the top of the wealth distribution. In the 2014 survey, households in which the reference person was self-employed represented 13% of all households, but 42% of household in the top 10%, and 48% of households in the top 1%. The table also shows that this pattern is visible for all years. For instance in 1986, households in which the reference person was self-employed represented 41% of households in the top 1% vs. 17% in the whole population; in 2010 these households represented 12% of the whole population and 58% of the top 1%.<sup>17</sup>

While the Wealth Surveys provide useful insights, they only contain information at household level making it hard to investigate gender differences in the patterns highlighted in Table 1. To investigate potential gender differences, we reproduce the previous analysis using the large dataset created by Garbinti et al. (2016), which contains individual-level information on wealth. Garbinti et al. (2016) apply a mixed capitalization method to compute individual-level wealth from several data sources (income tax returns, wealth surveys, national accounts, etc.), since 1970. As it is primarily based on administrative data from income tax returns, this dataset also offers a more reliable source than wealth surveys for older years and a better description of the top of the wealth distribution over the period. It also benefits from a larger sample of individuals, which makes it possible to analyze how the share of self-employed individual varies along the entire wealth distribution.<sup>18</sup> Our main findings from this dataset are reported in Figure A2, which plots the share of self-employed in each wealth percentile separately for men and women and for the years 1970, 1994 and 2012.<sup>19</sup> For both men and women, the figure shows that the share of self-employed individuals increases almost consistently along the wealth distribution, in particular at the very top. In 1994, self-employed men represent about 20% of active men in the 81st-85th percentiles of the wealth distribution, 30% in the 86th-90th percentiles, 40% in

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scale Savings Survey which made it possible to compute households' wealth was conducted in 1967, but the self-employed were excluded from its sample. Other similar surveys in which the self-employed were interrogated took place from 1970 to 1976. In this first analysis, we use data from the Savings Survey of 1973 and from all Wealth Surveys since 1986.

<sup>17</sup>The class of assets covered by the Wealth Surveys have varied somewhat over time. The sampling scheme used in the recent surveys is also designed to offer a much more accurate representation of the top of the wealth distribution than in older surveys. These changes make it hard to interpret the precise evolution in the share of self-employed in each top wealth percentile between surveys.

<sup>18</sup>On the other hand, this data does not contain precise information on individuals' profession. In this analysis, individuals are defined as self-employed when their income from self-employment exceeds wages earned, these two types of income being declared separately in the French income tax returns. This definition is not consistent with the one that we use in the Wealth Surveys.

<sup>19</sup>2012 is the most recent year for which the dataset is available. We choose 1994 as a middle point because a more detailed dataset on income tax returns became available at this date, offering more precise estimates.

the 91st-95th percentiles and 60% in the 96th-100th percentiles. The same pattern holds for self-employed women, who represent respectively about 5%, 10%, 20% and 30% of active women in the same wealth categories in 1994. Consistent with Table 1, Figure A2 also shows that this pattern can be observed for all years, for both men and women.

Overall, we find evidence in these two distinct data sources that both self-employed men and self-employed women are overly concentrated at the top of the wealth distribution. This relationship has been persistent in France since at least the 1970s, despite substantial changes in the nature of self-employment over the same period.<sup>20</sup> In the next sections we explore the extent to which this reflects a causal relationship between wealth and entry into self-employment.

## 4 Empirical strategy

In this paper, we rely on the consistency of two different approaches to investigate how an exogenous wealth shock impacts the decision to become self-employed, and the performance of the firms created. The section describes these two approaches in more details.

### 4.1 The timing of inheritance receipt

In our first strategy, we use the receipt of an inheritance as a shock to individuals' wealth. As it has been pointed out by a number of authors before, the receipt of an inheritance in itself can be correlated to individual factors affecting self-employment. For example, Hurst and Lusardi (2004) find that future (rather than past) inheritances are also good predictors of the probability to become self-employed at one point in time. To be sure, Table A2 provides evidence of marked observable differences between inheritors and non-inheritors in our sample. To alleviate this concern, our strategy relies on the comparison of individuals who receive an inheritance at one point in time with individuals who will receive one a little later. More precisely, for each given age between 20 and 64, we compare the rates of entry into self-employment among individuals who receive an inheritance at that age and among those who receive an inheritance in the next five years. Under the assumption that the exact age of receipt of an inheritance is uncorrelated with individual characteristics determining self-employment, this comparison provides causal evidence of the impact of a wealth shock on self-employment. In particular, by comparing individuals who are all inheritors, we eliminate the issue that inheritors might differ from other individuals on

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<sup>20</sup>In the Wealth surveys, we found that the concentration of self-employed at the top of the wealth distribution does not hold to the same extent for all groups of self-employed. It is more salient for licensed professionals such as lawyers and physicians, and for farmers and entrepreneurs, but is not visible e.g. for shopkeepers.

some time-invariant unobservables. Econometrically, our first specification is the following model:

$$y_{it} = \alpha + \beta \text{Inh}_{it} + X_{it}\gamma + \epsilon_{it} \quad (1)$$

where  $y_{it}$  is a dummy indicating that individual  $i$  becomes self-employed during year  $t$ , and  $\text{Inh}_{it}$  is a dummy taking value 1 if  $i$  receives an inheritance at time  $t$  and 0 if  $i$  receives an inheritance between  $]t, t + 5]$ .<sup>21</sup> We exclude inheritances comprised of productive assets such as firms or professional tools.  $X_{it}$  is a vector of controls, including a set of five-year age dummies, controls for parent's occupation and assets, and other individual controls such as education, gender, number of children and relative diploma. In this model, the coefficient of interest is  $\beta$ , which captures the effect of receiving an inheritance on the probability to become self-employed. In an alternative specification, we include the logarithm of the amount inherited as the variable of interest instead of  $\text{Inh}_{it}$ .

## 4.2 Real-estate price variations and the collateral channel

In our second strategy, we use the fact that real-estate price variations induce variations in homeowners' collateral value but not in renters'. This approach is used for instance in Adelino et al. (2015) for the US and Schmalz et al. (2017) in the case of France, and is akin to a difference-in-differences estimator where the treatment is the growth of real-estate prices, the treatment group includes homeowners, and the control group is comprised of renters. As described by Schmalz et al. (2017), this strategy can be slightly tweaked in the case of France as home equity extraction is not possible for homeowners with a mortgage outstanding in this country.<sup>22</sup> Therefore, we only include owners without an outstanding mortgage ("full" owners) in the treatment group, and owners with an outstanding mortgage ("partial" owners) are included in the control group together with renters. One may worry that renters do not constitute an adequate control group as their rent may be affected by an increase in real-estate prices. However, rent adjustments for incumbent tenants are strictly controlled in France and cannot exceed an index computed at the national level by the national Statistical Office (Insee), which does not take real-estate prices into account. Therefore, such an effect is unlikely; to be sure we also provide robustness checks when only partial owners are included in the control group.

<sup>21</sup>In Table A6, panel A shows that our results are unchanged when we replace this timespan by  $]t, t + 2]$ .

<sup>22</sup>If they sell their house, they can of course use the amount received to start a business. However such individuals would also exit our data, which samples dwellings not households.



Our second empirical strategy relies on the following model:

$$y_{iut} = \alpha + \beta \Delta p_u^{t-6 \rightarrow t-1} \times \text{owner}_i + X_{iut} \gamma + \epsilon_{iut} \quad (2)$$

where  $y_{iut}$  is a dummy indicating that individual  $i$ , living in an urban unit of size  $u$  becomes self-employed in  $t + 1$ .  $\Delta p_u^{t-6 \rightarrow t-1}$  corresponds to the 5-year growth rate of real estate prices in the urban unit of size  $u$  and  $\text{owner}_i$  is a dummy indicating that  $i$  is a full owner at time  $t$ .  $X_{iut}$  is a vector of controls, including year  $\times$  urban unit size, year  $\times$  owner and owner  $\times$  urban unit size dummies.<sup>23</sup> In this model, the coefficient of interest is  $\beta$ , which captures the effect of a variation in housing prices on the probability to become self-employed.

## 5 Wealth shocks and men's entry into self-employment

In this section, we focus on men and investigate the effect of wealth shocks on their likelihood to enter self-employment, and how this has varied over time. We first present graphical evidence for both of the empirical strategies described above, and then turn to a regression analysis. In section 6, we reproduce this regression analysis for women.

### 5.1 Graphical evidence

We start by presenting graphical evidence on the evolution over time of the effect of wealth shocks on men's entry into self-employment. To begin with, Figure 3a plots the probability of transition to self-employment for inheritors over time. We compute this probability averaged over 10-year intervals, separately for individuals observed on the year of receipt of their inheritance (grey line) and for those observed in the five years preceding the receipt (black line).<sup>24</sup> The gap between those two lines provides direct evidence of the impact of inheritance receipt on the likelihood to become self-employed. Connecting dots indicate that the difference between the two probabilities is significant at the 10 % level. During the period 1945-1964, male workers were about 4 percentage points more likely to become self-employed during the year of receipt of their inheritance than in the five preceding years: the rate of entry into self-employment increases from

<sup>23</sup>Our treatment variable operates at the year  $\times$  urban unit size  $\times$  owner level since house prices are measured at the year  $\times$  urban unit size level. We control for all pairwise interactions of these three variables (year, urban unit size and owner). Note that year  $\times$  urban unit size controls capture the main effect of house price increases  $\Delta p_u^{t-6 \rightarrow t-1}$ .

<sup>24</sup>We pool the periods 1945-1954 and 1955-1964 together because there are few observations in the data for each of these two periods.

about 1% to 5%. This gap is significant at the 10% level and corresponds to about four times the baseline probability of entry into self-employment over this period. The figure shows that this gap has significantly decreased over the second half of the twentieth century. In 2005-2014 it was only of about 0.2 percentage point, corresponding to a negligible increase in the probability of transition to self-employment. This trend suggests that the impact of a wealth shock on men's transition to self-employment has become lower over time.

To go one step further, Figure 3b focuses on wealth shocks for homeowners induced by an increase in housing prices. It plots the evolution over time of the difference between the rate of transition to self-employment of full owners and of other individuals (renters and partial owners). Each year, we compute these rates of transition separately for the two regions which experienced the largest 5-year real estate price increase (grey line), and for the three regions which experienced the lowest price increase (black line). The gap between these two lines represents the difference-in-difference estimator of the effect of a high house price increase on the rate of entry into self-employment of full homeowners relative to other individuals. For each period the grey line is above the black one: homeowners are all the more likely to become self-employed relatively to other individuals that they live in regions which experienced high real estate price increases. This is consistent with the idea that positive wealth shocks increase the rate of entry into self-employment. However, the extent to which this is the case has decreased over time. The gap between the two lines was about 0.5 percentage point and significant at the 10% level in 1975-1984, and it fell to less than 0.1 percentage point (not significant) in 2005-2014. Overall this graph presents a very similar result as Figure 3a: the impact of a wealth shock on men's rate of entry into self-employment seems to have decreased over the 1975-2014 period.<sup>25</sup>

## 5.2 Econometric results

The graphical results presented in the previous section suggest that wealth shocks have a positive impact on men's rate of entry into self-employment. They also suggest that this effect has decreased over the second half of the twentieth century. In this section, we turn to a regression analysis to test the robustness of this finding.

To start with, the first panel of Table 2 reports the estimations of the coefficient  $\beta$  in equation (1) for the 1945-1964 period and for each 10-year period between 1965 and 2014, for the subsample of men. Over the 1945-1964 period this estimate is equal to 0.0409, indicating that inheritors

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<sup>25</sup>In Figure A3, we reproduce the analysis of Figure 3 by intervals of 5 years instead of 10 years. The general message remains the same as in Figure 3.

employed as salaried workers (or unemployed) are on average 4.09 percentage points more likely to become self-employed on the year of the receipt of their inheritance than in the five years preceding it. This effect is significant at the 1% level and represents an increase of about 240% in the baseline probability to become self-employed (i.e. a multiplication by almost 3.5) for a median inherited amount of about €30k. The first panel of the table shows that the magnitude of this coefficient has decreased constantly over time, whereas the size of inheritances stayed roughly constant. The receipt of an inheritance increases the likelihood to become self-employed by 1.8 percentage points in 1965-1974, .56 percentage point in 1975-1984, and .62 percentage points in 1985-1994. For the last two decades between 1995 and 2014 the coefficients are close to zero and not statistically significant. The effect of receiving an inheritance on entry into self-employment also decreases over time in relative terms. While inheritance receipt increases men's probability to enter self-employment by 160% in 1965-1974, this increase is only of a non-significant 30% in 2005-2014. These results confirm that over the 1945-2014 period, the impact of a wealth shock due to the receipt of an inheritance on men's transition from salaried work to self-employment has decreased.

In Panel B of Table 2 we conduct the same analysis when the log of the amount inherited is used as a dependent variable instead, so as to get an elasticity of the response to the amount received. For the period 1945-1964, we find that a 10% increase in the amount inherited increases the probability to become self-employed by about 1.9% (.026 / 1.4). The effect is about 1.7% and 1.3% for the periods 1965-1974 and 1985-1994 respectively, and is not significant in later periods, consistent with the results shown in Panel A of the table. In Panels A and B of Table A3, we show that these results are unchanged by the inclusion of a full set of control variables for education, number of children, parents' ownership of productive assets, land or housing, and parent's activity (including an indicator for parents' self-employment).<sup>26</sup>

To go one step further, the second panel of Table 2 focuses on the impact of a housing price increase. It reports the estimations of the coefficient  $\beta$  of equation (2) for each 10-year period between 1975 and 2014 on the subsample of men. Over the 1975-1984 period, a 5-year increase of 10% in real-estate prices increases homeowner's probability to become self-employed by 0.39 percentage point (30%); the estimate is significant at the 5% level. The rest of the panel shows that the magnitude of this effect decreases over time. Over the 1985-1994 period when housing

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<sup>26</sup>Panel A of Table A6 also reproduces this analysis comparing the probabilities of entry into self-employment for individuals who inherit a given year and those who inherit in the next two years. The results obtained are very similar. Our choice to consider inheritances received within a 5-year time window does not drive the results presented in the first panel of Table 2.

prices were increasing by 10% over 5 years, homeowners were .24 percentage point (17%) more likely than mortgaged owner or renters to become self-employed. The estimate is significant only at the 10% level. Over the rest of the period (1995-2014) the coefficients are not significant anymore. Overall, these results suggest that over the 1975-2014 period the impact of a wealth shock due to the increase of housing prices on a transition to self-employment has not remained constant but has instead decreased over time. In panel B of Table A3, we show that these results are unchanged by the inclusion of a full set of control variables for age, education, number of children, and sector and industry of employment.<sup>27</sup>

The analyses of the effect of inheritance receipt and real estate price variations on entry into self-employment yield similar conclusions: the effect has decreased over time and is not significant since the end of the 1990s. However, both sets of results differ slightly in their magnitude for each period. For example, a real estate price increase of 100% in 1985-1994 corresponds on average to an increase in wealth of €127,400 (the average house price in our data over this period), suggesting that an additional €1,000 in wealth increases homeowners' entry rates to self-employment by 1.3% ( $1000 * 0.0235 / (0.014 * 127,400)$ ). By contrast, over the same period a 100% increase in the amount inherited represents an increase in wealth of about €38,4000, indicating that an additional €1,000 in wealth increases inheritors' entry rates to self-employment by .4%. These differences are not entirely surprising since the population of interest is different in both empirical strategies; for example, the population of inheritors is older than the population of homeowners.<sup>28</sup>

More generally, our effects fall well within the range of those estimated in previous works. While to the best of our knowledge our work is the first to estimate these effects over a long period of time, several estimates concerning restricted time periods are available for comparison in previous studies. Over the 1970s in the US, Evans and Jovanovic (1989) structurally estimate that removing credit constraints would increase by 34% the rate of transitions to self-employment. This is associated to an increase in capital by at most €27,077, as they identify that the optimal amount of start-up capital for the most able entrepreneurs was \$1978 16,739 and that average

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<sup>27</sup>In these regressions, we also control for the interactions of all these variables with the five-year growth rate of housing prices. The population of renters and full homeowners have different socio-demographic characteristics, and heterogeneity in the effect of real estate price increases on entry into self-employment along these characteristics could therefore be driving the difference of the effect between homeowners and renters. Controlling explicitly for the interaction between house price growth and individuals' socio-demographic characteristics alleviates this concern.

<sup>28</sup>There are other potential explanations for these differences. For example, they could also be due to non-linearities in individual responses to wealth shocks, since house price variations and inheritance receipt typically generate shocks of different magnitudes. Differences in the sampling designs of the Wealth Survey and Labor Force Surveys could also help explain these differences.

assets in their sample was \$1978 7,433. Under the assumption that the impact of wealth is linear this translates into effects of a very similar magnitude as the ones we estimate in this paper over the 1975-1984 period: an increase in entry rates into self-employment of 1.3% for an additional €1,000. Over the 1980s in the US, the literature found smaller impacts than the ones we have identified. Holtz-Eakin et al. (1994) found that over the 1981-1985 period, an exogenous \$100,000 increase in assets induced a 17% increase in transition rates to self-employment (from 19.3% to 22.6%). Using variation in real estate prices over the 1985-1988 period, Hurst and Lusardi (2004) found no significant effect of an exogenous increase in net wealth on transition to self-employment in 1989. However the literature focusing on Europe during the same period has found larger effects. In Sweden for example, Lindh and Ohlsson (1996) studied lottery winners in 1981 and found that a SEK 76,700 increase in wealth generated a 2 percentage points increase in the probability to become self-employed, from 7.4% to 9.4%. This estimate would indicate that a €120,000 shock to wealth should increase transition rates to self-employment by a factor of 4 to 5 assuming that the effect of wealth is linear. Over the 1990s in Europe the literature has found both larger and smaller impacts than the ones we identify. Nykvist (2008) report an effect of similar magnitude than the one found by Lindh and Ohlsson (1996), using variations in real estate prices in Sweden over the 1999-2001 period, which is larger than the two effects we identify over the 1995-2004 period. Finally, our effect is close to the one reported by Andersen and Nielsen (2012) for Denmark, who found that receiving a €134,200 inheritance over the 1995-2001 period increases the chances of becoming self-employed by .95 percentage points from a baseline of 2.1%, which corresponds to about a 50% increase. Over this period, the paper closest to ours is Schmalz et al. (2017). We discuss the comparison of our results to this paper in the next section.

### **5.3 Some robustness checks**

#### **5.3.1 Response to real-estate price increases**

##### **Measurement error in house prices**

The part of our paper which builds on house price variation is very close to Schmalz et al. (2017). The comparison of our results with those presented in that paper offers some insights on the robustness of our approach. We use the same empirical strategy and the same employment data as in Schmalz et al. (2017), but because we focus on a longer period of time we are only able to compute real estate prices for five broad regions of France while they build on data from

25 smaller regions. By doing so, our identification relies on a weaker source of variation and a basic question is therefore to what extent this influences our results. To shed light on this issue, the first column of Table 3 shows the results of the estimation of equation (2) on the same period as the one analyzed by Schmalz et al. (2017) (1992-2002).<sup>29</sup> On this specific period, we find that a doubling of real estate prices over five years increases full owners' probability to enter self-employment by 1.4 percentage points compared to renters, but this effect is significant only at the 10% level. This point estimate is extremely close to the one reported by Schmalz et al. (2017), although their estimate is significant at the 1% level. This suggests that our strategy produces very similar results but has a lower power than one using more detailed house prices.

This observation raises the question of whether our result indicating that the effect of a real estate price increase on entry into self-employment vanishes in recent years may be due to a lack of statistical power. In order to test this, we obtained from the French notaries a database containing detailed house price transaction data since 1994. This database makes it possible to estimate equation (2) using 5-year real-estate price growths for the 21 regions of France after the year 2000. The results of these estimations for the periods 2002-2014 and 2005-2014 are reported in columns (2) and (3) of Table 3. These results confirm the absence of significant effects of real estate price increases on individuals' probability to become self-employed over the 2005-2014 period, even when we build on more variation in real estate prices. Overall, the estimations shown in Table 3 are indicative that the results of Table 2 are not driven by the fact that we use real estate price variation coming from only 5 regions of France.

### **Excluding renters from the control group**

The previous estimates of the effect of house price variation on entry into self-employment are essentially based on a difference-in-difference strategy where the treated group of "full" owners (those without a mortgage outstanding) is compared to a control group comprised of all other individuals. The exclusion restriction underlying the validity of this strategy is that house price variations differentially affect entry rates into self-employment of these two groups of individuals only through an increase in full owners' wealth. As pointed out by Schmalz et al. (2017), this hypothesis may not hold if house price variations have an effect on renters' likelihood to become self-employed, for example through variations in rents paid. We should stress that this is unlikely

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<sup>29</sup>In this analysis we also change the sample slightly to be as close as possible to Schmalz et al. (2017); instead of restricting our sample to men only, we follow their paper and restrict the sample to the person of reference of each household. These individuals are identified on a basis that has varied over time; in some waves of the survey, they can be both men or women but in practice the overwhelming majority of persons of reference are men so that this only constitutes a minor change to our sample.

to be an issue, as landlords in France cannot freely adjust the rent due by incumbent tenants. Rents can only evolve according to an index computed at the national level by the national Statistical Office (Insee), and real-estate prices are not taken into account by this index. Only new tenants' rents can be affected by house price variations, but these individuals are excluded from our sample by construction.

To be sure that a potential effect of house price variations on renters' entry into self-employment is not driving our results, we reproduced the previous analysis on the subsample of homeowners only.<sup>30</sup> In this case, identification relies on the fact that homeowners with an outstanding mortgage cannot extract home equity in France (second lien loans are very rare), except if they sell their house (in which case they would exit our dataset). Table A4 shows the results on the estimation of equation (2) on this sample. It leads to very similar conclusions as Panel B of Table 2.

### 5.3.2 Response to inheritance receipt

#### Sample distortion over time

Our analysis of the effect of inheritance receipt on entry into self-employment is based on retrospective information available for respondents of the French Wealth Survey. Since we use data from the waves 1998-2014 of this survey, this implies that observations for the years 1945-1964 typically correspond to younger individuals than observations for subsequent years, because only individuals still alive in one of the survey years will enter the sample. As a result, the age structure of the sample changes over time: the average age over the years 1945-1964 is 31, while it is 46 in the years 2005-2014. A basic question is therefore whether this may be driving the differences in the effect of inheritance receipt on entry into self-employment between periods, which may be the case if this effect is heterogenous across ages.<sup>31</sup>

As a first test of this idea, panel A of Table A5 reproduces the analysis on the subsample of individuals aged 20-44 instead of 20-64. Restricting the analysis to younger individuals makes the samples more comparable between periods: the average age of individuals on this subsample is 30 in 1945-1964 and 36 in 2005-2014. Under the assumption that changes in the sample composition across periods are driving the differences in the effect of inheritance receipt on entry

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<sup>30</sup>The baseline control group is preferred as it gives us more statistical power. However both give similar results.

<sup>31</sup>A related concern is that social subgroups with longer longevity may be over-represented in older periods because of differential mortality rates. However, mortality rates are typically declining with income and wealth, so that we expect wealthy or high-income individuals to be over-represented in older periods in our sample. There is evidence that these individuals face less financial constraints than those with lower income (see e.g. Schmalz et al. (2017)); if anything, this suggests that our results for older years will underestimate the magnitude of the effect of wealth shocks on self-employment decisions.

into self-employment between periods, making the samples more comparable should reduce these differences. However, the results show that this is not the case: for the subsample aged 20-44, receiving an inheritance increases entry rates into self-employment by a factor of more than two in 1945-1964, by 140% in 1964-1975, and we still find no significant effect for the last two periods. To go one step further, we also reproduced the analysis on the sample of individuals aged 45-64. In a last set of analyses, we considered the full sample of individuals a estimated a weighted regressions in which individual weights were computed so that the age distribution of individuals each year would fit the age distribution of individuals in the 1975-1984 period.<sup>32</sup> The results of these estimations are reported in panels B and C of Table A5. They also show that the effect of inheritance receipt on entry into self-employment decreases over time, although the statistical significance of the estimates is lost for the sample of individuals aged 45-64 due to small sample sizes. Overall, these analyses suggest that differences in the age-composition of the samples between periods are not driving our results.

### Recall bias

Our estimations of the effect of inheritance receipt on entry into self-employment rely on the retrospective data on careers and inheritances available for respondents of the French Wealth Survey. Because of its retrospective nature, this data may be subject to some measurement error. In particular, it is a possibility that individuals tend to round the year or age at which events occurred in their lives. To be sure, Figure A4 plots the distribution of ages and years of receipt of inheritance and of transition to self-employment reported by the respondents of the Wealth Survey. The figure shows little evidence that individuals report a higher number of inheritances and transitions to self-employment when their age is a multiple of 10. However, it does show some evidence that individuals tend to round reported years both for inheritance receipt and self-employment transitions to multiples of 10. Such measurement error could induce an upward bias in our estimates by creating a spurious correlation between the year of inheritance and the year of transition to self-employment, both being rounded to the nearest multiple of 10.<sup>33</sup> To test this, Panels B and C of Table A6 show the results of the estimation of equation (1) when we exclude observations for which individuals' age is a multiple of 10 or observations for years that

<sup>32</sup>Weights are determined in the following way. For a given year  $t$ , all individuals of age  $a$  have the same weight  $w_{a,t}$ , and this weight is so that the (weighted) share of individuals of age  $a$  that year equals the share of individuals of age  $a$  in the period of reference  $T$ :  $\frac{n_{a,t}w_{a,t}}{n_t} = \frac{n_{a,T}}{n_T}$ . This yields  $w_{a,t} = \frac{n_{a,t}/n_t}{n_{a,T}/n_T}$ .

<sup>33</sup>For instance, an individual who became self-employed in 1968 and received an inheritance in 1972 may report that the two events occurred in 1970. This would allocate this transition in the treated group while it actually belongs to the control, increasing artificially the impact of the treatment (receiving an inheritance).



are a multiple of 10. These alternative sample selections do not change the sign of the results:  $\beta$  is positive for all periods. The magnitude and significance of the coefficient also remain the same; in particular, the first estimate for the 1945-1964 period is significantly larger than the one for the 2005-2014 period. This suggests that our results on the effect of inheritance receipt are not driven by the recall nature of our data.

### **Anticipation bias**

Our empirical strategy identifies the effect of inheritance receipt on entry into self-employment by relying on the comparison of the rates of entry on the year of receipt of an inheritance and in the five preceding years. While this strategy alleviates the concern that inheritors may differ from other individuals on unobservables which may be correlated to entry into self-employment, it may produce results that are biased upwards if individuals tend to postpone their entry in anticipation of an inheritance. This might happen for several reasons. For example, individuals may be reluctant to engage in the time-consuming activity of creating a business at a time of their life when one of their close parent needs care. If this is the case, we should observe that individuals in our sample become less likely to enter self-employment in the years immediately preceding the receipt of their inheritance compared to years even further away from this event. To test whether we find evidence of such behavior in the data, Figure A5 plots the rates of entry into self-employment in our sample by year since the receipt of an inheritance; the rate of entry 5 years before inheritance receipt is taken as a reference. The figure shows that the rate of entry into self-employment stays roughly constant in the years preceding the receipt of the inheritance, close to its level 5 years before inheriting. It then increases on the year of receipt and stays significantly higher for three years before slowly decreasing to its initial level. In particular, we find no sign of decrease in this rate in the few years that precede the receipt of an inheritance. This pattern does not support the hypothesis of an anticipation bias in our estimates.<sup>34</sup>

## **6 Wealth shocks and women's entry into self-employment**

The previous sections have explored the effect of wealth shocks on men's entry into self-employment. In this section, we reproduce this analysis for women and document gender differences in average

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<sup>34</sup>Figure A5 also offers an additional test that our results are not due to recall errors. Under the assumption that the rounding of years to the nearest multiple of 10 is driving the results, we should observe that the effect of inheritance receipt on entry into self-employment is concentrated on the year of receipt. Figure A5 shows that this is not the case: the rates of entry into self-employment remain significantly higher two years after the receipt of an inheritance.

and period-specific effects of wealth shocks on entry into self-employment. The share of women among individuals entering self-employment has grown substantially in the last 40 years: in the LFS we find that women represented about 20% of individuals entering self-employment in 1975, while this figure had risen to 40% in 2014. Two factors have contributed to this rise: the first one is the general increase in women’s labor force participation, and the second one is the relative stability over time of the share of self-employed (excluding assisting spouses) among working women. While the share of self-employed men fell from about 32% in the 1950s to 14% in the 2000s, the share of self-employed women decreased much less, from about 14% in the 1950s to 8% in the 2000s (see Figure 1).

There is a growing literature documenting the existence of important differences in male and female-owned businesses. In many countries, women start businesses with less capital than men (see e.g. Piacentini (2013)). Using a survey on newly created firms conducted every 4 years since 1994 by the French statistical office, we find that in France women use on average about 10% less capital at startup than men.<sup>35</sup> There is however a debate on the interpretation of this finding. On the one hand, it could indicate that women face more obstacles in obtaining a bank loan; some works have found evidence that banks discriminate against female-owned businesses (see e.g. Muravyev et al. (2009)). On the other hand, it could also indicate that women require less capital to become self-employed; a potential explanation for this could be that women have on average a worst perception of their entrepreneurial ability (see e.g. Minniti and Nardone (2007)). In this case, we should observe that wealth shocks induce an increase in entry rates into self-employment which is lower for women than for men.

In order to shed light on these issues, Table 4 first reproduces the results of Table 2 on the sample of women. As it turns out, we do not find any statistically significant effect of either inheritance receipt or house price variations on women’s likelihood to enter self-employment, at any point in time. To be sure, we also conducted an analysis pooling all years available in the data from the Wealth Survey (1945-2014) and from the LFS (1975-2014). Panels A and B of Table A7 show the results of the estimation of equations (1) and (2) respectively on these pooled samples, for men and women separately. The first column of the table leads to similar conclusions. On average over the period 1945-2014, the receipt of an inheritance significantly increases men’s probability to enter self-employment by about .7 percentage point, corresponding

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<sup>35</sup>The difference between the average startup capital for men and women is statistically significant at the 1% level and holds even when controlling for the sector in which the business is started. The survey used is the *Système d’Information sur les Nouvelles Entreprises - SINE*, which samples about one third of businesses created or transferred a given year.

almost to a doubling of this probability. By contrast, we find that women are only .1 percentage point (or about 25%) more likely to become self-employed after receiving an inheritance. This effect is not statistically significant, and is significantly lower than the effect on men at the 5% level. Panel B shows that the results obtained using house price variations over the period 1975-2014 lead to similar conclusions: compared to renters, women who fully own their house are no more likely to become self-employed when real-estate prices increase. Even though we find no significant effects for men in column (1) of Panel B, results also indicate that the point estimate is significantly lower for women than for men.

These differences may to some extent reflect the fact that recent years are over-represented in the sample of women relative to the sample of men. Because women's labor force participation has increased over the period, working women are more numerous in recent years relative to older periods. Since the effect of wealth shocks on entry into self-employment tends to decrease over time, this may partly explain the differences between men and women found in column (1) of Table A7. To be sure, we conducted two other sets of regressions. In a first set of analyses, we reweighted observations for women so that the share of individuals observed a given year would be the same in the sample of men and of women. In a second set of regressions, we reweighted both the sample of men and of women so that observations would be distributed uniformly across years in each sample. The results of these analyses are shown in columns (2) and (3) of Table A7. They lead to similar conclusions as the results presented in column (1) of the table.

Another possible concern is that by excluding assisting spouses from our sample (but not the other self-employed spouse that they help), we introduce a dissymmetry between the sample of men and of women: some self-employed men in our sample likely benefit from the help of their spouse, whereas this is much less likely to happen for women in our sample. It is unclear how this would affect our estimates; to be sure, we reproduced the previous analyses on a sample of men or women whose spouse (if any) remains salaried for the whole period and found very similar results to the ones reported here.

Overall, these results are not consistent with the hypothesis that women face more constraints from banks than men, but actually suggest the opposite relationship. This is in line with some of the previous works on this subject. For example, Georgellis and Wall (2005) provide suggestive evidence of lower liquidity constraints for women than for men in Germany by showing that wealth is less correlated with transitions towards self-employment for women than for men. Mijid (2015) also shows that women-owned businesses are less likely than men-owned businesses

to be Type I credit-rationed in the US.<sup>36</sup> Taken together with the finding that women use less startup capital than men, these results support the idea that deep differences in women’s and men’s entrepreneurial ventures make the former less reliant on capital than the latter.<sup>37</sup>

## 7 Wealth shocks and men’s entrepreneurial outcomes

The previous sections have provided evidence that positive wealth shocks significantly increased men’s entry rates into self-employment before the early 2000s. These results indicate that a fraction of individuals were unable to become self-employed before receiving additional wealth, which may suggest that they faced difficulties in securing external sources of financing through banks or capital markets. Under the assumption that capital markets are well-functioning, these self-employed individuals should carry projects of lower quality than those which are able to secure external funding. In this section, we test this assumption by comparing the entrepreneurial outcomes of men who become self-employed after a wealth shock with those of other self-employed men.

We focus on firm survival as the outcome of interest, as firms that collapse early on are likely to be less profitable than those that survive. If constraints were efficient we should see individuals who become self-employed because they received a wealth shock stopping earlier their entrepreneurial experience. Indeed banks should screen out individuals that have the higher default probability and we should see those they give a loan to staying longer self-employed.

We therefore compare the length of self-employment spells of men who became self-employed after they received a wealth shock to the length of self-employment spell of those who became self-employed without this wealth shock. We first consider a basic survival model, namely:

$$h_i(t) = h_0(t) \exp(X_{it}\gamma + \delta I_i) \quad (3)$$

where  $h_i(t)$  denotes the probability that individual  $i$  exits self-employment after having been self-employed for a time  $t$ , conditional on still being self-employed right before  $t$ .  $I_i$  is a dummy taking

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<sup>36</sup>Other interpretations are possible for the lack of effect of wealth shocks on women’s probability to become self-employed. For example, Bernhardt et al. (2017) document that women tend to invest their capital in their husband’s venture instead of their own. However, we tested for cross-effects of women’s inheritance receipt on their husbands’ probability to enter self-employment and did not find statistically significant effects in the Wealth Surveys. Another explanation may be that women face other binding constraints than financial ones, more so than men. For instance, Shaw and Stringfellow (2006) show that women have to rely on looser networks than men for help with business management and financial decisions.

<sup>37</sup>Actually within sectors the gender gap in startup capital is even wider, suggesting that the sectoral composition of women activities doesn’t drive this result.

value 0 if  $i$  became self-employed in the 5 years preceding the receipt of her inheritance, and 1 if  $i$  became self-employed in the year of receipt. We assume that  $I_i$  has a multiplicative effect on a baseline hazard  $h_0(t)$ , which corresponds to a standard proportional hazard model. In this model, the parameter of interest is  $\delta$ , which captures whether individuals who became self-employed after receiving an inheritance have a higher or lower chance of exiting self-employment at any point in time. More precisely, in this model, those individuals have  $\exp(\delta)$  more chances to exit self-employment at any point in time than individuals who became self-employed before receiving their inheritance. The estimation of this model requires information in continuous time, which is not available in our data. Instead, we observe events grouped in one-year intervals. In this context, it can be shown that model 3 can be rewritten as a binary model with a complementary log-log link function to accommodate interval data. Therefore, we estimate the parameters of model 3 using the following specification:

$$y_{it}^* = \mu_t + X_{it}\gamma + \delta I_i + \nu_{it} \quad (4)$$

where  $y_{it}^*$  is a latent variable such that  $y_{it} = \mathbb{1}_{\{y_{it}^* \geq 0\}}$  with  $y_{it}$  a dummy indicating that individual  $i$  exited self-employment during interval  $[t; t + 1[$ .  $\mu_t$  is an effect specific to the amount of time for which the individual has been self-employed, and the error term  $\nu_{it}$  follows a complementary extreme value type I distribution (specifically,  $P(\epsilon > x) = 1 - \exp(-\exp(-x))$ ). The parameters  $\gamma$  and  $\delta$  identified by model 4 are the same as those in model 3.

Table 5 panel A reports the results of the estimation of the coefficient  $\beta$  in model 4 on our data for years during which we identified credit constraints. We also report the multiplicative exponentiated effect as a percentage increase or decrease from the baseline. The first column reveals that, compared to individuals who became self-employed in the five years before receiving an inheritance, those who became self-employed on the year of receipt have on average 11% less chances of exiting self-employment at any given year in the 1945-1974 period. However, this effect is not significant. Over the 1975-1994 period the effect is reversed but remains insignificant. Over this period, individuals who became self-employed in the five years before the receipt of an inheritance had on average 25% more chances of exiting self-employment at any given year than those who became self employed on the year of receipt. This result suggests that men who became self-employed after the receipt of an inheritance do not have higher chances to exit self-employment at any point in time after. This should entail that they do not stay self-employed for a shorter amount of time.

To see how self-employment spell duration vary for spells started at the receipt of a housing price shock versus spells started without the receipt of a housing price shock, we re-estimate equation (2) with as dependent variable a dummy indicating that individual  $i$  remained self-employed in the two years following his transition. The sample is further restricted to individuals who have transitioned to self employment on the first time they were interrogated in the LFS. In other words we compare how an increase in housing price differentially impacts the probability to remain self-employed two years for self-employed individuals who are full owners and for those who are either renters or mortgaged owners. Table 5 panel B reports the corresponding estimate. We see that the estimate is non statistically significant, confirming the results obtained with the wealth survey.

These results are indicative that men who become self-employed before or after a wealth shock stay self-employed for a similar length of time.<sup>38</sup> To go one step further, we checked for another indicator of firms' performance with the LFS. We used as outcome employment the first or second years firms start operating and we re-estimated equation 2 for individuals who switched to entrepreneurship the first year they were interrogated by LFS. Results are reported in table A8. For the 1975-1994 period, we do not find any difference in employment patterns of firms created by home owners or by firms created by renters or mortgage owners facing a similar housing price growth rate.

Alltogether our results argue that the credit constraints identified between 1945 and 1994 were not efficient: they prevented the creation of firms that would have lasted as long and that would have employed as many workers. These results contrast with the findings of some of the previous works on the subject. For example, Andersen and Nielsen (2012) found opposite results for a sample of firms created following an inheritance in Denmark. However, our results are in line with recent findings by Schmalz et al. (2017), who show that while real estate price appreciations influence entry into self-employment in France over the 1990s, there is no evidence of a link between house price variations and new firms' performance.

## 8 Discussion

The previous sections have shown that positive wealth shocks increase men's entry rates into self-employment, but that the magnitude of this effect has decreased over time. These results indicate that, while prospect entrepreneurs face difficulties in securing external sources of financ-

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<sup>38</sup>Our results might be biased if individuals who start their business after a wealth shock and those that start it before do not have the same start-up capital. The sign of the bias is however unclear.

ing through banks or capital markets, those difficulties have declined and become non-significant over the past 70 years. This could be due to a decline in the average initial level of capital necessary to start a business, or it may reflect changes in the availability of external financing. In this section, we discuss and test some of the possible causes and implications of both of these hypotheses successively.<sup>39</sup>

## 8.1 Has capital become less relevant to start a business ?

The sectoral breakdown of economic activity has changed substantially since the end of the second World War. This had an effect on the distribution of both employees and self-employed individuals across sectors. To be sure, Figure 2 reports the evolution of the distribution of self-employed men across economic sectors over the 1975-2015 period. It shows that the share of self-employed in the service sector increased markedly over the period from about 20% to 40% of the total number of self-employed. Meanwhile, the share of self-employed in the agricultural sector decreased in equivalent proportions. Under the assumption that services require less initial investment than agriculture, this structural transformation of the economy may have decreased the average needs for start-up capital. This could be a potential driving force behind the declining effect of wealth shocks on entry into self-employment.

In order to test this hypothesis, Table 6 reports the results of the estimation of equation (2) on the subsample of men, where we replaced the dependent variable by a dummy indicating a transition to self-employment in a sector different from the services (panel A) or different from agriculture (panel B).<sup>40</sup> Under the assumption that the tertiarisation of the economy is driving the decline in the impact of a wealth shock on the transition to self-employment, this declining pattern should not be observed on transitions to sectors other than services and agriculture. As it turns out, the table shows that the effect remains decreasing over time when we exclude transition to these sectors. This suggests that other transformation, beyond the tertiarisation of the economy have driven the decline in the impact of a wealth shock on transitions to self-employment.

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<sup>39</sup>Although we only discuss these two channels, other hypotheses are possible. For example, the willingness of individuals to enter credit deals may have increased over time. Although we did not find any work on this issue in the existing literature, there is evidence that stress may increase temporal discounting (Haushofer et al. (2017)), which could suggest that individuals may have been less willing to enter credit deals in the aftermath of the second World War. This effect might have worn off as the memory of the war started to fade out.

<sup>40</sup>We cannot reproduce this analysis using inheritance receipt as a wealth shock because the wealth survey does not contain retrospective information on the sector of activity of individuals.

## 8.2 Has it become easier to secure external funding?

The laws regulating financial institutions and the distribution of credit have changed tremendously since the 1950s in developed countries, and France is no exception (see e.g. Melitz (1990)). A substantial amount of research has been done to understand whether these evolutions lead to a more efficient distribution of credit. In this section, we summarize the main evolutions of the financial regulation in France since the 1950s and review some of the literature examining the effects of these changes on credit. We also provide direct evidence that these evolutions can help explain the results presented in the previous sections.

In the aftermath of the second World War, the new French government put in place a very restrictive regulation of the banking system. Commercial and investment activities were strictly separated, and the State exerted a tight control on the overall distribution of credit. As part of its economic planning, the State decided of the interest rates of loans and of which sectors to distribute credit to in priority. This made it particularly complicated for entrepreneurs who did not belong to these priority sectors to obtain a loan. Besides, all entrepreneurs had to justify that the credit they required could not be reduced, was urgent and could not be obtained from other sources than banks (Barrère, 1951). Specialization existed between banks, which were only authorized to distribute specific types of loans with a specific maturity and interest rate. The State also had become a major player in the banking sector through the nationalizations of almost all major banks. In 1967, a first law was introduced which ended the separation of commercial and investment banking and lifted the control of the state on the opening of new branches by banks (*loi Debré*). In the 1980s, France followed the global movement of financial liberalization. In the fall of 1984, the specialization of banks was ended and a unified regulation applying to all banks was enforced, and in 1985 most of the subsidized loans were suppressed and the close monitoring of the credit supply was abolished. A host of measures were voted in this decade, including a law allowing the assignment of receivables under a much simplified form (1984), the creation of a new futures market on bonds (1986), and the authorization of the securitization of mortgage paper (1988).

At the same time new regulations lowered the barriers to entry. One case in point is the *Loi Dutreil*. First it simplified the administrative process and lowered the capital requirement of firm creation. Second, it smoothed transition of salaried workers toward entrepreneurship. Third it strengthened incentives to invest in firms and launched new investment funds that facilitated startups access to finance. Finally it facilitated companies buyouts, lowered taxes on gains related



to cessation of business and exempted of death duties part of bequeathed firms. Appendix B provides further details on this law.

To better measure the extent of financial reforms, the IMF has developed an index based on seven regulatory criteria each assigned a grade from 0 to 3 (Abiad et al. (2010)); the index takes values from 0 (most regulated) to 21 (most deregulated). The criteria taken into account are the existence of credit controls, entry barriers, banking supervision, the degree of privatization of the sector, international capital flow controls, and the existence of security markets. The financial reform index database contains yearly information for most countries since 1973. In France over this period, the financial reform index increased consequently from 6 in the 1970s to 21 in the 2000s. France was not the only country to follow this trend: for example the financial reform index was equal to 6 in Sweden and 13 in the US in the 1970s, and it had reached 21 in both countries in the 2000s.

During the 1970s, French firms' bank debt had grown tremendously fuelled by low real interest rates and subsidised credit. In the early 1980s, a growing concern was emerging over the real cost of this debt in the context of the low inflation policy (the strong Franc) that the newly elected government targeted. The effect of the various measures liberalizing the banking industry and the financial sector was both to boost the distribution of credit to small firms and to allow bigger firms an easier access to other sources of financing such as capital markets (Melitz (1990)).<sup>41</sup> This rise of financing resources may have played a role in explaining the decreasing impact of a wealth shock on the probability to start a business.

As a basic test of this idea, we explore whether a link can be found in the previous literature between the size of the effect of wealth shocks on entry into self-employment, and the degree of financial liberalization that prevailed in the studies' period and country of analysis. For each study in the existing literature, we compute a standardized point estimate by dividing the relative effect of a wealth shock on entry rates into self-employment by the amount of the wealth shock considered (expressed in €10,000).<sup>42</sup> We then build a database indicating for each study the country and period of analysis and the standardized effect found by the authors, and we merge this database with the financial reform index database. To sum up our findings, Figure 4a plots

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<sup>41</sup>In Figure A6, we plot the ratio of non-financial firms' equity and credit flows to firms' investment. This figure shows an increase in the equity-to-investment ratio in the 1980s. In the more recent years, additional sources of external funding have also emerged such as business angels, venture capital or even crowdfunding (see e.g. Ekeland et al. (2016)).

<sup>42</sup>We include the following studies in this meta-analysis: Hurst and Lusardi (2004), Evans and Jovanovic (1989), Holtz-Eakin et al. (1994) and Kerr et al. (2015) for the US, Taylor (2001) for the UK, Connolly et al. (2015) for Australia, Lindh and Ohlsson (1996) for Sweden, Andersen and Nielsen (2012) for Denmark, and our own estimates for France.

the standardized effect of wealth shocks on entry into self-employment against the corresponding value of the financial reform index from the IMF database (rescaled between 0 and 1). As it turns out, we find a clear negative relationship between the financial reform index and the effect of a wealth shock on the transition to self-employment across countries. The coefficient of the regression line is -3.2 and is significant at the 1% level, suggesting that moving from full financial regulation to full financial liberalization decreases the effect of receiving an additional €10,000 on entry into self-employment by 320 percentage points. In Figure 4b, we show that this relationship remains when we filter out country-specific effects by plotting the residuals of the estimation of the regression of the standardized effect on a set of countries dummies against the residuals of the same regression for the financial reform index. Overall, these results are consistent with the idea that financial liberalization may be a key explanation behind the decrease in the effect of wealth shocks on entry rates into self-employment over time in France, and of the differences in the estimates reported in previous works. These results are in line with the literature documenting the existence of causal effects of financial reforms on the real economy. For example in the case of France, Bertrand et al. (2007) find an increase in firms entry due to the deregulation reform of 1985.<sup>43</sup>

## 9 Conclusion

In this paper we study the causal impact of wealth on entry into self-employment. We make use of two different identification strategies: the first one compares inheritors before they receive an inheritance and on the year when they receive it, the second compares the difference in the likelihood to enter self-employment of full owners and other individuals in regions that experience large housing price growth and in other regions. Using these two strategies, we find significant effects of wealth shocks on men’s rate of entry into self-employment, but no effect for women. For men, the effect has decreased over the second half of the 20th century.

We explore two potential explanations for this. First, we analyse whether changes in the sectors of activity of the self-employed may help explain the decrease in the effect of wealth on entry into self-employment for men. As it turns out, we obtain results that are very similar

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<sup>43</sup>These results are also in line with studies documenting the effect of loan guarantee programs on lending. Such programs were also created in France during the 1980s. For example in 1982, the *Société Française de Garantie des Financements des PMS* (Sofaris) started to act as a security for up to 70% of a loan (see e.g. Bach (2005)); in 1983, the *Compte pour le développement industriel* (Codevi), a saving account with guaranteed rates of return that collected funds for subsidized loans, was created. Lelarge et al. (2010) document that these two programs may have helped boost firm creations.

when excluding agriculture or the service sector, which are those which have evolved the most over the period. Second, we show that our results are consistent with other impacts found in the literature of the financial deregulation on business entry. Using a meta-analysis, we find that the relationship between financial regulation and impact of a wealth shocks on entry into self-employment is also observed in a larger set of developed countries. Further research may be needed to explore the causal impact of financial deregulation on the effect of a wealth shock on entry into self-employment.

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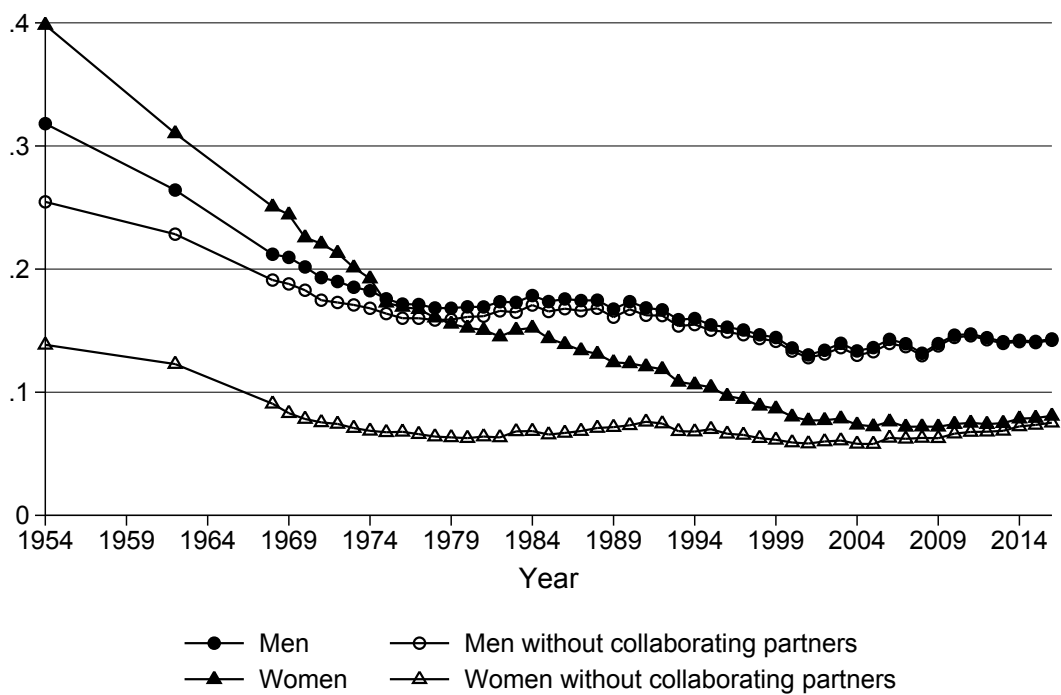
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## Figures and tables

Figure 1 – Share of self-employed in the workforce over time

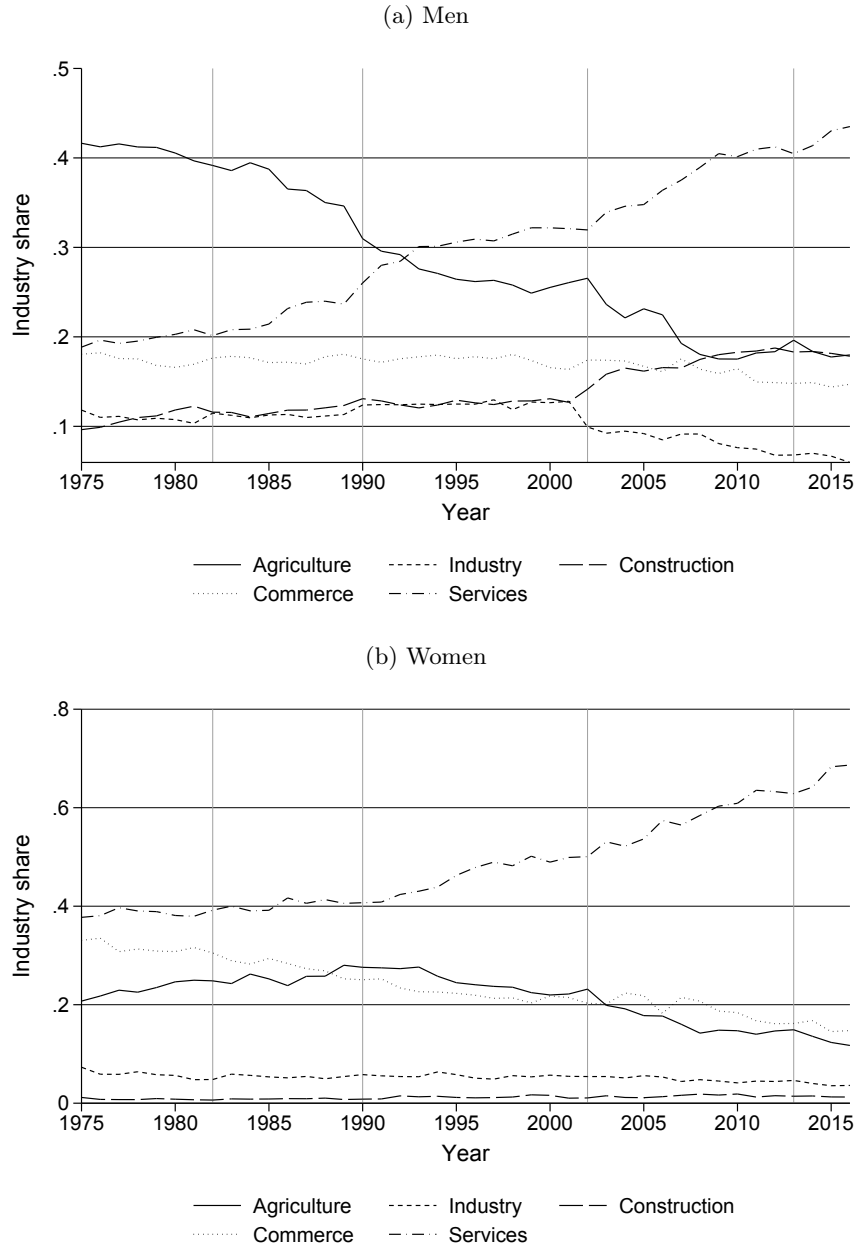


*Note:* the figure shows the share of self-employed in the workforce, separately for men and women, with or without assisting spouses. The sample is restricted to the working population and to individuals between 15 and 64 years old.

*Source:* Population census 1954, 1962. French Labor Force Survey 1968-2014.



Figure 2 – Industry distribution of the self-employed over time



*Note:* the figures plot the share of self-employed men and women working in each sector over time. Vertical lines indicate years of changes in the questionnaire of the French Labor Force Survey. Three changes in the classification of sectors also occurred in 1993, 2003 and 2008.

*Source:* French Labor Force Survey, 1975-2014.

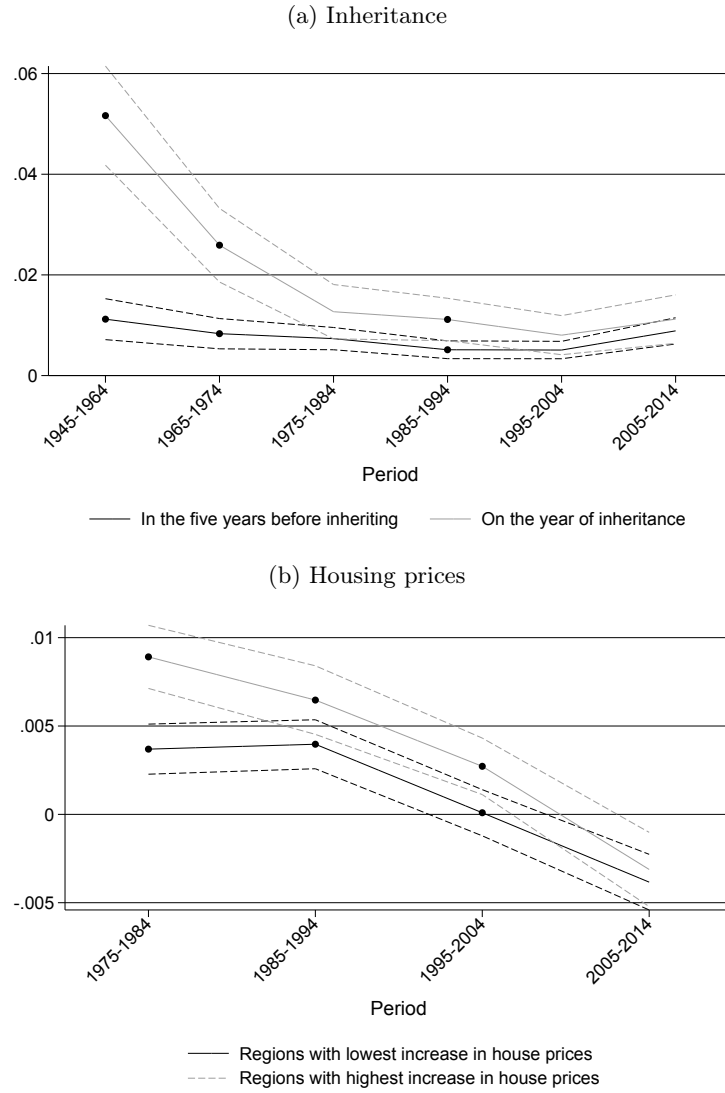
Table 1 – Share of self-employed by wealth percentile over time

Wealth Percentile, Top	1%	5%	10%	20%	Whole
<b>2014</b>	0.48	0.46	0.42	0.32	0.13
<b>2010</b>	0.58	0.49	0.42	0.33	0.12
<b>2004</b>	0.50	0.42	0.35	0.29	0.12
<b>1998</b>	0.36	0.39	0.36	0.29	0.14
<b>1992</b>	0.46	0.43	0.39	0.33	0.14
<b>1986</b>	0.41	0.31	0.29	0.27	0.17
<b>1973</b>	0.39	0.27	0.22	0.18	0.14

*Note:* This table reports the share of households in which the person of reference or his/her partner is self-employed, by household wealth level. The sample is restricted to households with a person of reference between 15 and 65 years old. The self-employed are defined using individuals' reported labor force status at the time of the survey. All averages are weighted average using sample weights to account for specific sampling design.

*Source:* French Wealth Survey, 1986-2014.

Figure 3 – Wealth shocks and men’s entry into self-employment over time: graphical evidence



*Note:* the figure focuses on men. Figure (a) plots the rate of transition to self-employment of individuals observed on the year of receipt of an inheritance (black line) or in the five preceding years (grey line). Figure (b) plots the difference between the rate of transition to self-employment of homeowners and renters, separately for the two regions which experienced the highest 5-year real-estate price increase (black line) and for the other three regions (grey line). Dots on the lines indicate that the difference between the two lines is significant at the 10% level for a given period. 90% confidence interval are plotted in dashed lines.

*Source:* French Wealth Survey, 1998-2014 (Figure a) and French Labor Force Survey, 1975-2014 (Figure b).

Table 2 – Wealth shocks and men’s entry into self-employment over time

	(1)	(2)	(3)	(4)	(5)	(6)
	1945-1964	1965-1974	1975-1984	1985-1994	1995-2004	2005-2014
<b>Panel A: inheritance (dummy)</b>						
Inheritance	0.0409*** (0.0155)	0.0176** (0.0084)	0.0056 (0.0044)	0.0062* (0.0032)	0.0029 (0.0026)	0.0027 (0.0039)
Obs.	1462	2668	4931	7794	8268	3929
Mean dep. var.	0.017	0.011	0.008	0.006	0.006	0.009
Median amt. (2010€)	30000	49899	47910	38359	45000	43532
<b>Panel B: inheritance (amount)</b>						
Amount inherited (log)	0.00251* (0.00129)	0.00169** (0.000854)	0.000416 (0.000430)	0.000794** (0.000362)	0.000108 (0.000216)	0.000465 (0.000411)
Obs.	1161	2207	4139	6884	7460	3623
Mean dep. var.	0.014	0.010	0.008	0.006	0.005	0.009
<b>Panel C: housing prices</b>						
Owner $\times \Delta p$			0.0394** (0.0170)	0.0235* (0.0130)	0.0048 (0.0070)	-0.0047 (0.0072)
Obs.			161118	164702	168569	94459
Mean dep. var.			0.013	0.014	0.008	0.009
Price/m <sup>2</sup> (2010€)			1389	1376	1617	2299

*Note:* Panel A reports the estimates of a linear probability model regressing a dummy indicating that an individual becomes self-employed the following year on an inheritance dummy taking value 1 on the year of inheritance and 0 in the five preceding years. In Panel B, this dummy is replaced with a variable equal to the log of the inherited amount on the year of inheritance, 0 otherwise. Panel C reports the estimates of a linear probability model regressing a dummy indicating that an individual becomes self-employed the following year on an interaction term between a dummy indicating homeownership and the growth rate of housing prices in the region of residence. Regressions in both panels include a set of controls for age. Regressions in Panel C also include a full set of controls for year, region, homeownership, region  $\times$  year, homeownership  $\times$  year and homeownership  $\times$  region. The sample includes salaried or unemployed men aged 20-64. In each column we present the results obtained using the subsample of observations made during indicated years. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014 (Panels A and B) and French Labour Force Survey, 1975-2014 (Panel C).

Table 3 – House price variations and entry into self-employment: robustness

	(1) 1992-2002	With 21 regional real estate prices	
		(2) 2002-2014	(3) 2005-2014
Owner $\times \Delta p$	0.0146* (0.0081)	0.0138** (0.0071)	0.0098 (0.0089)
Obs.	228533	180539	119705
Mean dep. var.	0.010	0.006	0.008

*Note:* The table reports the results of regressing a dummy indicating a transition to self-employment within the next year of the interaction between a dummy indicating homeownership and the growth rate of housing prices in the region of residence, and the same controls as in Panel C of Table 2. In the first column, we consider housing prices computed from the French Housing Survey for five regions of France defined by urban area size. In columns (2) and (3), we use housing prices computed for all 21 administrative regions of France using house price transaction data coming from the French notaries. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Labor Force Survey, 1992-2014.

Table 4 – Wealth shocks and entry into self-employment over time: women

	(1)	(2)	(3)	(4)	(5)	(6)
	1945-1964	1965-1974	1975-1984	1985-1994	1995-2004	2005-2014
<b>Panel A: inheritance</b>						
Inheritance	0.0033 (0.0089)	0.0082 (0.0069)	0.0048 (0.0040)	0.0000 (0.0021)	-0.0006 (0.0015)	-0.0010 (0.0025)
Obs.	839	1733	3748	7105	7796	3645
Mean dep. var.	0.006	0.005	0.004	0.004	0.003	0.005
Median amt. (2010€)	50939	73859	52112	32518	41677	38883
<b>Panel B: housing prices</b>						
Owner $\times\Delta p$			0.0103 (0.0131)	-0.0108 (0.0085)	-0.0070 (0.0044)	-0.0060 (0.0068)
Obs.			113119	145469	167773	101555
Mean dep. var.			0.005	0.006	0.003	0.004
Price/m <sup>2</sup> (2010€)			1414	1397	1633	2304

*Note:* the Table reproduces Table 2 on the subsample of women. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014 (Panel A) and French Labour Force Survey, 1975-2014 (Panel B).

Table 5 – Wealth shocks and duration in self-employment over time

	(1) 1945-1974	(2) 1975-1994
<b>Panel A: inheritance</b>		
Became self-employed after inheriting	-0.113 (0.2594) -11%	0.220 (0.2290) 25%
Obs.	2099	1977
<b>Panel B: housing prices</b>		
Owner $\times \Delta p$		0.318 (0.262)
Obs.		1970
Mean dep. var.		0.770

*Note:* the Table focuses on the sample of men. Panel A reports the estimates of a complementary log-log model regressing an indicator of self-employment that takes value 1 when individuals stop being self-employed and 0 when individuals are self-employed on an indicator of transition to self-employment on the year of inheritance. Panel B reports the estimates of a linear probability model regressing an indicator that an individual's self-employment spell lasted at least two years on an interaction term between a dummy indicating home ownership and the growth rate of housing prices in the region of residence. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014 (Panel A) and French Labour Force Survey, 1975-1995 (Panel B).

Table 6 – Wealth shocks and men’s entry into self-employment: excluding various sectors

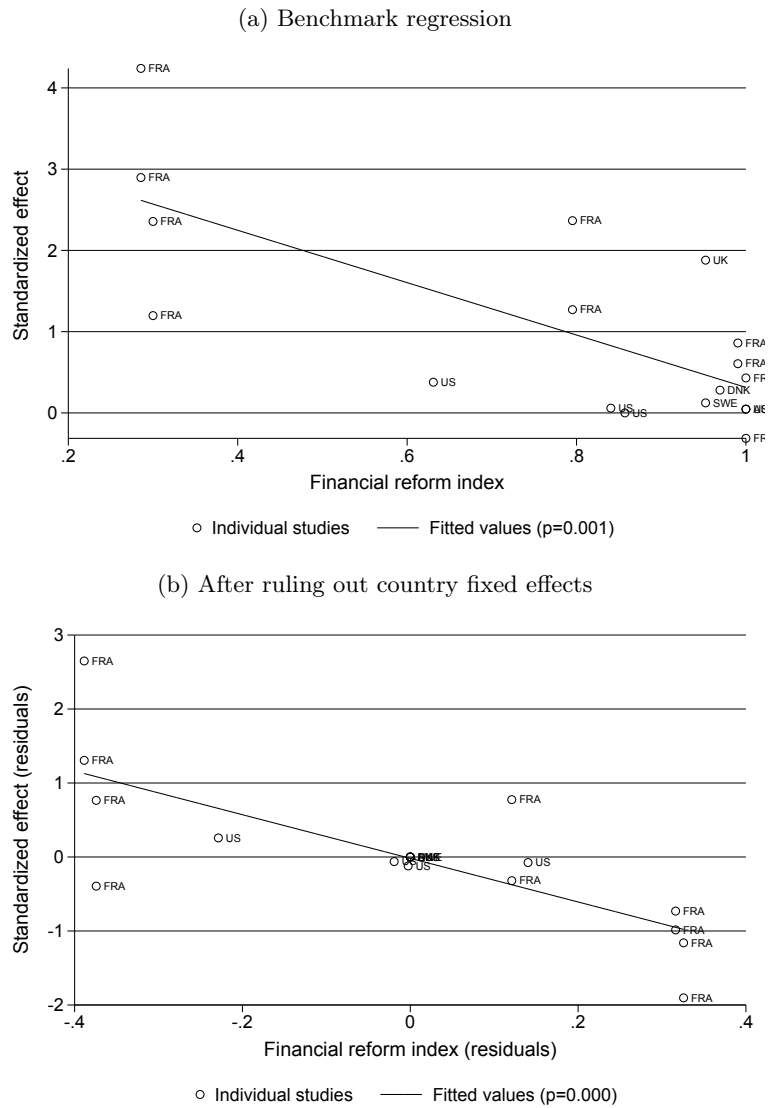
	(1) 1975-1984	(2) 1985-1994	(3) 1995-2004	(4) 2005-2014
<b>Panel A: transitions to any sector but agriculture</b>				
Owner $\times \Delta p$	0.0296* (0.0159)	0.0261** (0.0129)	0.00153 (0.00673)	-0.00191 (0.00703)
Obs.	161118	164702	168569	94459
Mean dep. var.	0.012	0.013	0.008	0.008
<b>Panel B: transitions to any sector but services</b>				
Owner $\times \Delta p$	0.0293** (0.0142)	0.00683 (0.00907)	0.00808 (0.00543)	0.00116 (0.00454)
Obs.	161118	164702	168569	94459
Mean dep. var.	0.009	0.009	0.005	0.005

*Note:* the table presents the results of the estimation of the same model as in Panel B of Table 2, where the dependent variable is replaced by an indicator of a transition to self-employment in a sector other than agriculture (Panel A) or other than services (Panel B). The table focuses on the sample of men. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Labour Force Survey, 1975-2014.



Figure 4 – Wealth shocks and entry into self-employment: the role of financial liberalization



*Note:* figure (a) plots the relationship between the standardized effect of a wealth shock on the probability to switch out of salaried work or unemployment to self-employment and the financial reform index of the IMF (Abiad et al. (2010)). Each point represents a result found in the literature on the relationship between wealth and entrepreneurship. The line is the linear regression line between those two variables. Figure (b) plots the residuals of a regression of the standardized effect on a set of country dummies against the residuals of a regression of the financial reform index on the same set of country dummies.

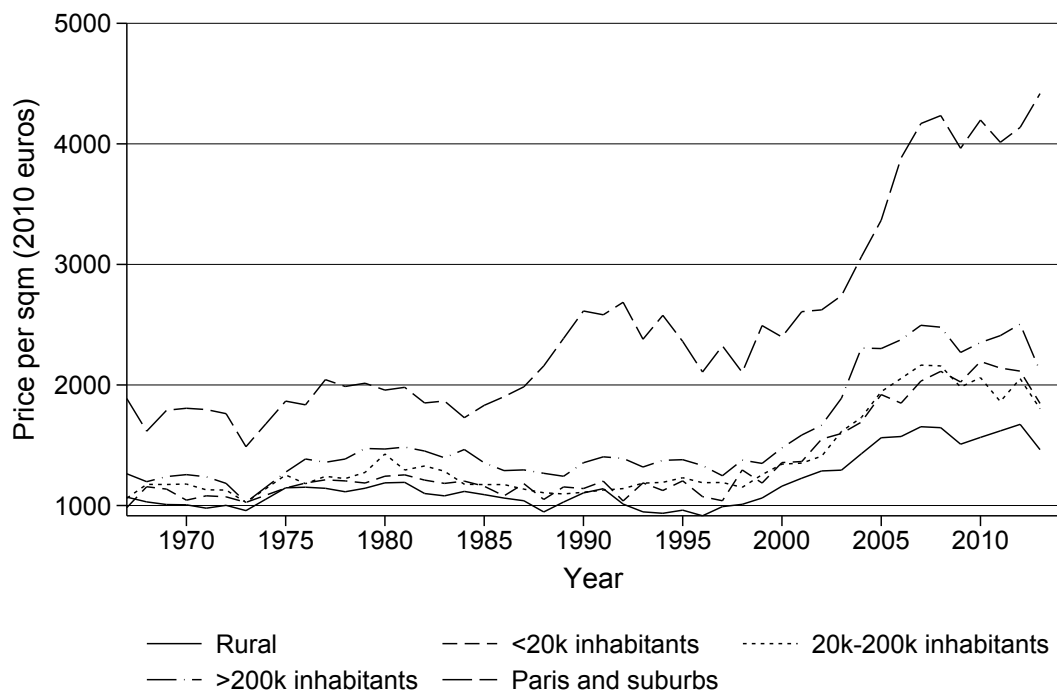
## A Further results

Table A1 – Real estate prices in the housing surveys

Data year	Real estate prices period	Number of observations
1970	1967 - 1970	1565
1973	1970 - 1973	4865
1978	1975 - 1978	2400
1984	1975 - 1984	6905
1988	1967 - 1988	3823
1992	1989 - 1992	3053
1996	1993 - 1997	2358
2002	1997 - 2002	4005
2006	2002 - 2006	3963
2013	2010 - 2013	1817

*Note:* respondents to the French Housing Survey are asked to report the price of purchase of their house if they bought it during a specific time window, usually spanning a few years before the interview. For each wave of the survey (column 1), the table reports the exact span of this time window (column 2) and how many house transaction prices are reported in this wave of the survey (column 3).

Figure A1 – Average real-estate prices by urban unit size

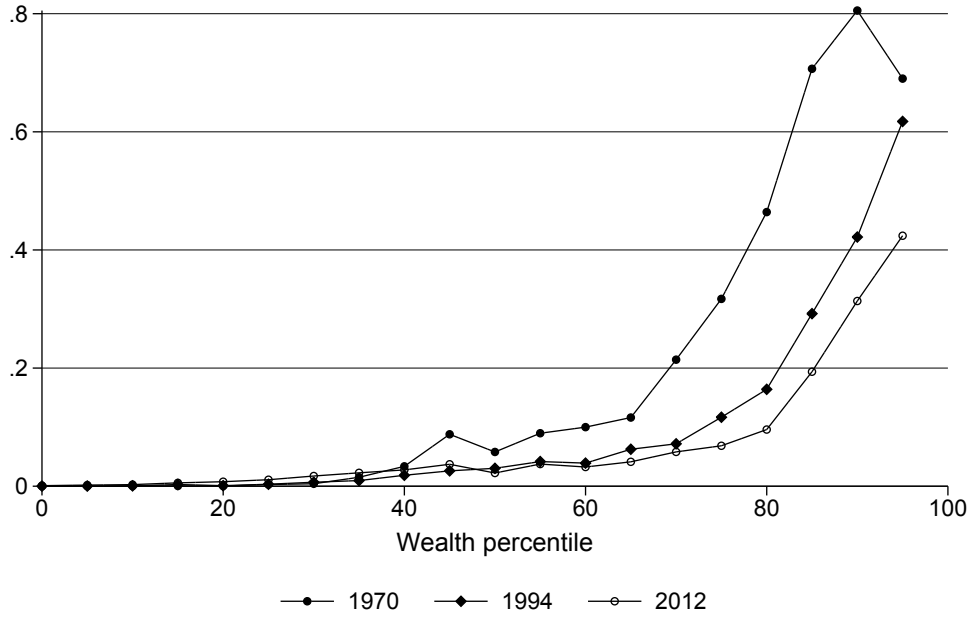


*Note:* the figure shows the average price per square meter reported by the respondents of the housing survey each year, by urban unit size.

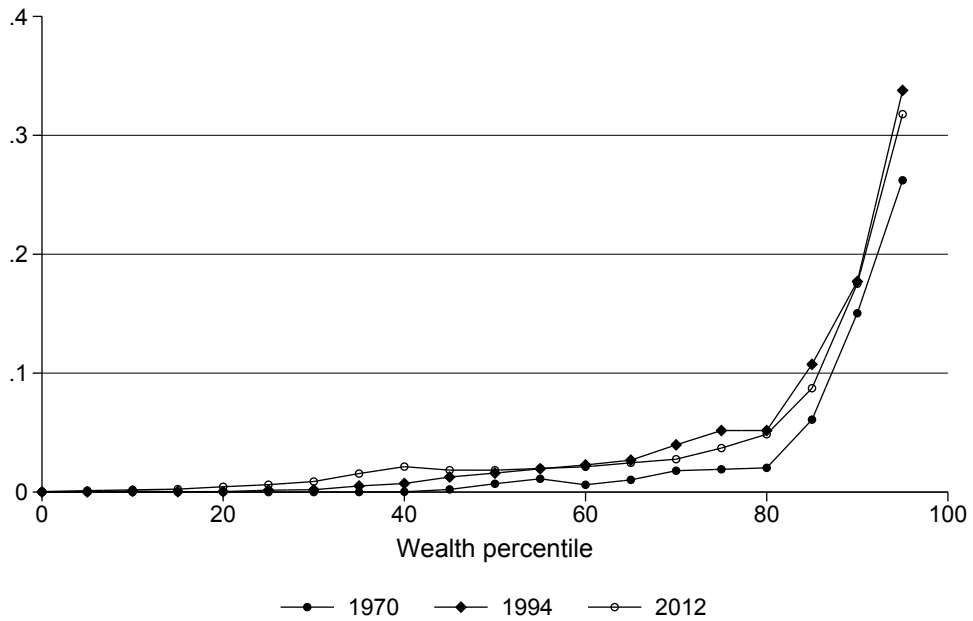
*Source:* Housing surveys, 1970-2013.

Figure A2 – Share of self-employed in the wealth distribution by gender

(a) Men



(b) Women



*Note:* the figure shows the proportion of self-employed individual in each 5-percentage point bin along the wealth distribution. We plot these shares separately for year 1970, 1994, and 2012, and for men (figure a) and women (figure b). Self-employed are defined as individuals who get higher incomes from industrial, commercial or agricultural benefits than from wages or unemployment benefits.  
*Source:* database compiled by Garbinti et al. (2016).

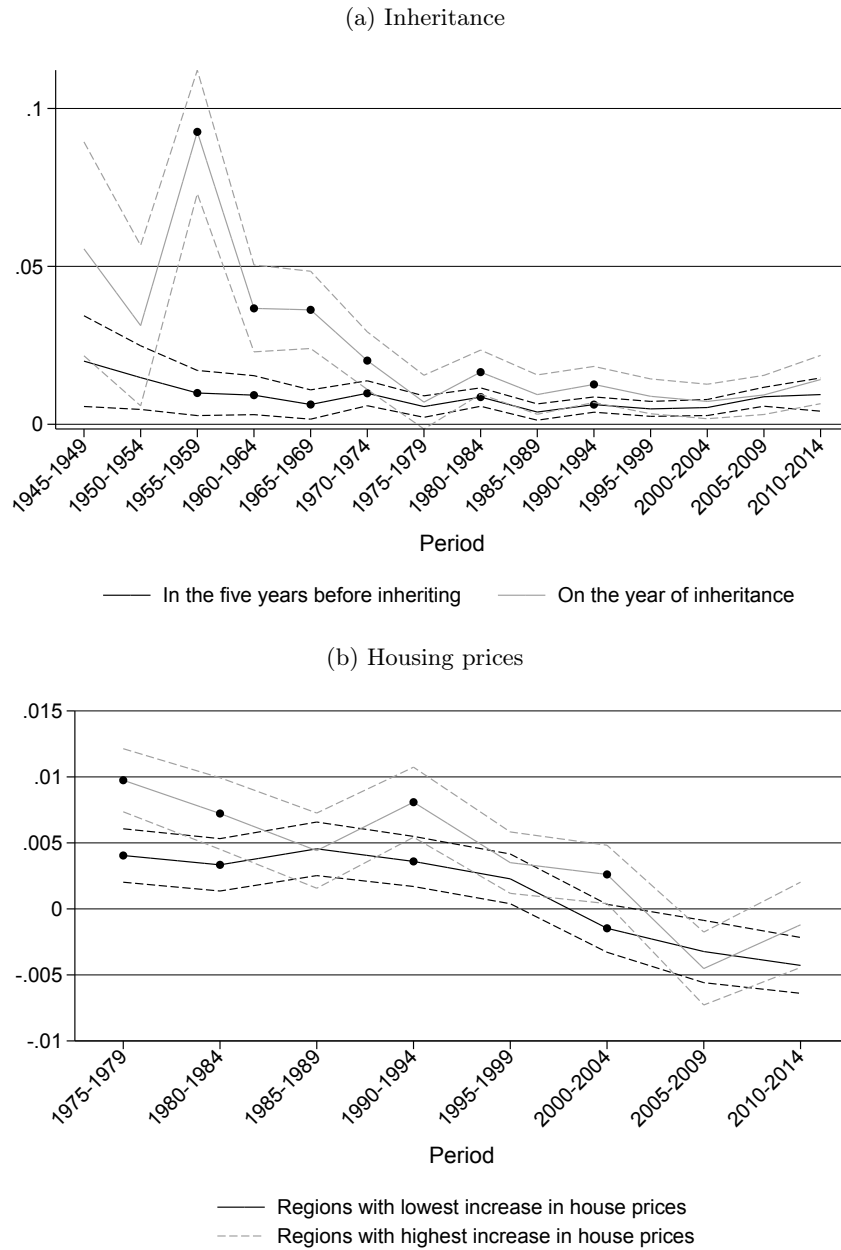
Table A2 – Characteristics of inheritors and other individuals in the wealth survey

	(1) Inheritors	(2) Others	(3) (1) vs. (2), p-value
<b>Occupation</b>			
Managers	0.219 (0.005)	0.125 (0.003)	0.000
Middle-level occupations	0.157 (0.004)	0.140 (0.003)	0.001
Blue-collar workers	0.190 (0.004)	0.246 (0.003)	0.000
Production workers	0.131 (0.004)	0.238 (0.003)	0.000
<b>Education</b>			
No education	0.201 (0.004)	0.330 (0.004)	0.000
Little education	0.332 (0.005)	0.358 (0.004)	0.000
Some education	0.139 (0.004)	0.125 (0.003)	0.002
Highly educated	0.323 (0.005)	0.167 (0.003)	0.000
<b>Other</b>			
Self-employed parent	0.539 (0.006)	0.406 (0.004)	0.000
Observations	8115	16962	

*Note:* the table focuses on individuals aged 65 and shows the main characteristics of individuals who have previously received an inheritance (column 1) and of those who have not (column 2). Since few individuals inherit after 65, we can presume that a majority of individuals in column (2) will never receive an inheritance. The third column shows the p-value of the difference between the means reported in columns (1) and (2). Standard error are reported in parentheses.

*Source:* French Wealth Surveys, 1998-2014.

Figure A3 – Likelihoods of entrepreneurship transition by wealth shock receipt over time



*Note:* this figure reproduces Figure 3, grouping observations by periods of 5 years instead of 10 years.

*Source:* French Wealth Survey, 1998-2014 (figure a) and French Labour Force Survey, 1975-2014 (figure b).

Table A3 – Wealth shocks and men’s entry into self employment: adding controls

	(1)	(2)	(3)	(4)	(5)	(6)
	1945-1964	1965-1974	1975-1984	1985-1994	1995-2004	2005-2014
<b>Panel A: inheritance (dummy)</b>						
Inheritance	0.0413*** (0.0155)	0.0180** (0.00839)	0.00548 (0.00442)	0.00614* (0.00322)	0.00285 (0.00257)	0.00281 (0.00395)
Obs.	1462	2668	4931	7794	8268	3929
Mean dep. var.	0.017	0.011	0.008	0.006	0.006	0.009
Median amt. (2010 €)	30000	49899	47910	38359	45000	43532
<b>Panel B: inheritance (amount)</b>						
Amount inherited (log)	0.00256* (0.00130)	0.00166* (0.000855)	0.000390 (0.000436)	0.000785** (0.000361)	0.0000950 (0.000218)	0.000502 (0.000409)
Obs.	1161	2207	4139	6884	7460	3623
Mean dep. var.	0.014	0.010	0.008	0.006	0.005	0.009
<b>Panel C: housing prices</b>						
Owner $\times \Delta p$			0.0355** (0.0169)	0.0257** (0.0130)	0.00466 (0.00692)	-0.00584 (0.00723)
Obs.			161118	164702	168569	94459
Mean dep. var.			0.013	0.014	0.008	0.009
Price/m <sup>2</sup> (2010€)			1389	1376	1617	2299

*Note:* this table reproduces Table 2, but with additional controls. In Panel A, additional control variables consist of four education dummies, a variable indicating the number of children of the individual, a set of dummies indicating parental ownership of the primary residence, of professional tools, and of land or other real-estate assets, and a variable indicating whether at least one of the individual’s parent is (or was) self-employed. In Panel B, a control for the log of the amount that will be inherited by an individual is also added. In Panel C, additional control variables consist of four education dummies, three dummies for the number of children of the individual, 9 dummies indicating the industry in which the individual works, and a dummy indicating whether the individual works in the public or private sector. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014 (Panels A and B) and French Labour Force Survey, 1975-2014 (Panel C).

Table A4 – Real-estate price variation and men’s entry into self employment: homeowners

	(1)	(2)	(3)	(4)
	1975-1984	1985-1994	1995-2004	2005-2014
Owner $\times \Delta p$	0.0476** (0.0193)	0.0281* (0.0146)	0.00370 (0.00788)	-0.0141 (0.00881)
Obs.	77450	91328	96604	58719
Mean dep. var.	0.015	0.015	0.008	0.008
Price/m <sup>2</sup> (2010€)	1341	1301	1548	2193

*Note:* the table reproduces Panel C of Table 2 on the subsample of homeowners. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Labour Force Survey, 1975-2014.



Table A5 – Inheritance and men’s entry into self-employment: age differences

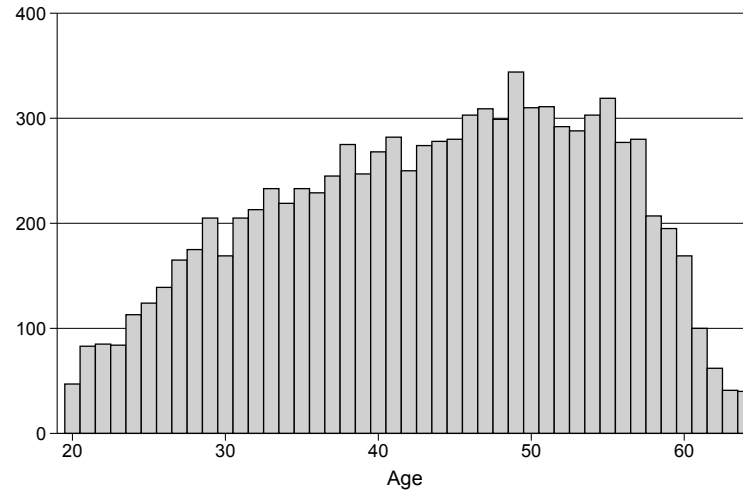
	(1)	(2)	(3)	(4)	(5)	(6)
	1945-1964	1965-1974	1975-1984	1985-1994	1995-2004	2005-2014
<b>Ages 20-44 only</b>						
Inheritance	0.0432*** (0.0164)	0.0165* (0.00929)	0.00581 (0.00629)	0.00745 (0.00469)	0.00255 (0.00440)	0.00140 (0.00832)
Obs.	1379	2154	3184	4434	3616	1455
Mean dep. var.	0.018	0.012	0.011	0.007	0.008	0.015
Mean age	30.13	32.24	33.65	34.82	35.13	35.75
<b>Ages 45-65 only</b>						
Inheritance		0.0225 (0.0194)	0.00522 (0.00538)	0.00469 (0.00434)	0.00314 (0.00301)	0.00335 (0.00411)
Obs.		514	1747	3360	4652	2474
Mean dep. var.		0.008	0.003	0.005	0.004	0.006
Mean age		48.83	51.18	51.48	52.23	53.12
<b>All ages, weights calibrated to fit age distribution in 1975-1984</b>						
Inheritance	0.0220** (0.00959)	0.0182** (0.00857)	0.00559 (0.00442)	0.00582* (0.00337)	0.00273 (0.00303)	0.00134 (0.00568)
Obs.	1462	2668	4931	7794	8268	3929
Mean dep. var.	0.010	0.009	0.008	0.006	0.006	0.013
Mean age	39.57	39.81	39.86	39.86	39.86	39.86

*Note:* Panel A of the table reproduces the results of Panel A of Table A3 on the subsample of men aged 20-44. Panel B reproduces the results of Panel A of Table A3 on the subsample of men aged 45-64. Panel C reproduces the results of Panel A of Table A3, but observations are assigned a weight so that the age distribution each year fits the age distribution in 1975-1984. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

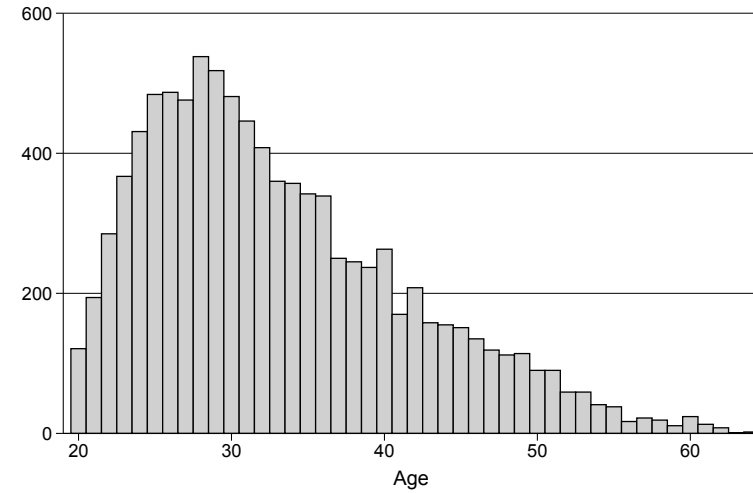
*Source:* French Wealth Survey, 1998-2014.

Figure A4 – Reported ages and years of inheritance and entry into self-employment in the Wealth Survey

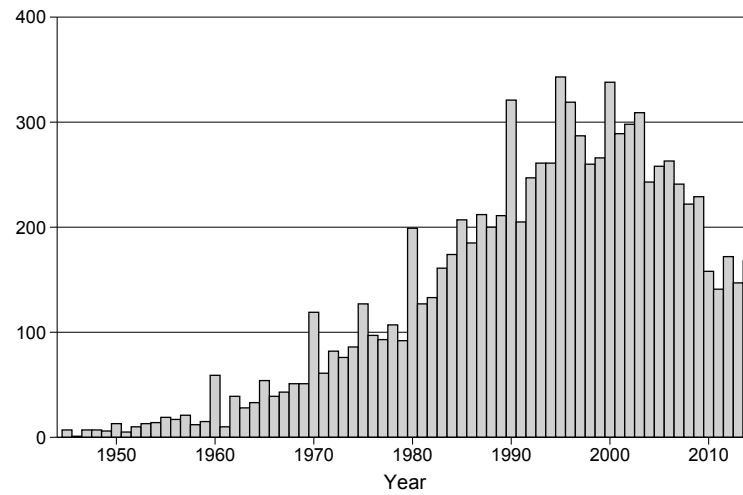
(a) Number of inheritances reported by age



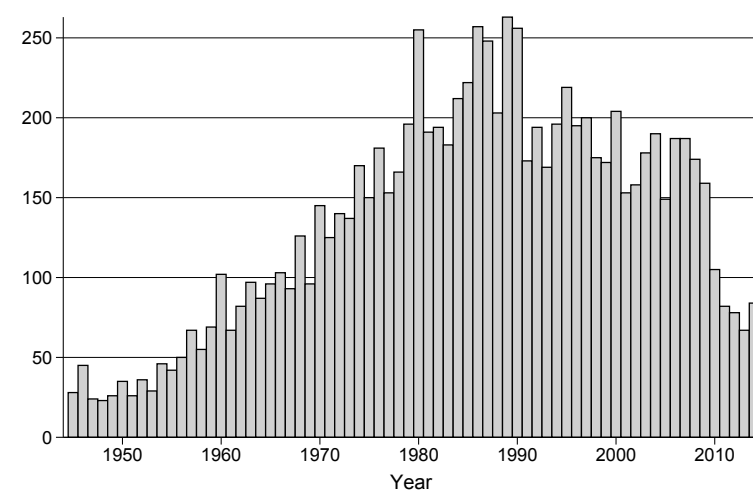
(b) Number of transitions to self-employment by age



(c) Number of inheritances reported by year



(d) Number of transitions to self-employment by year



*Note:* The figure shows the proportion of individuals in our sample who report an inheritance (figures a and c) or declare a transition to self-employment (figures b and d) for each age between 20 and 64 (figures a and b), or for each year between 1945 and 2014 (figures c and d).

*Source:* French Wealth Survey, 1998-2014.

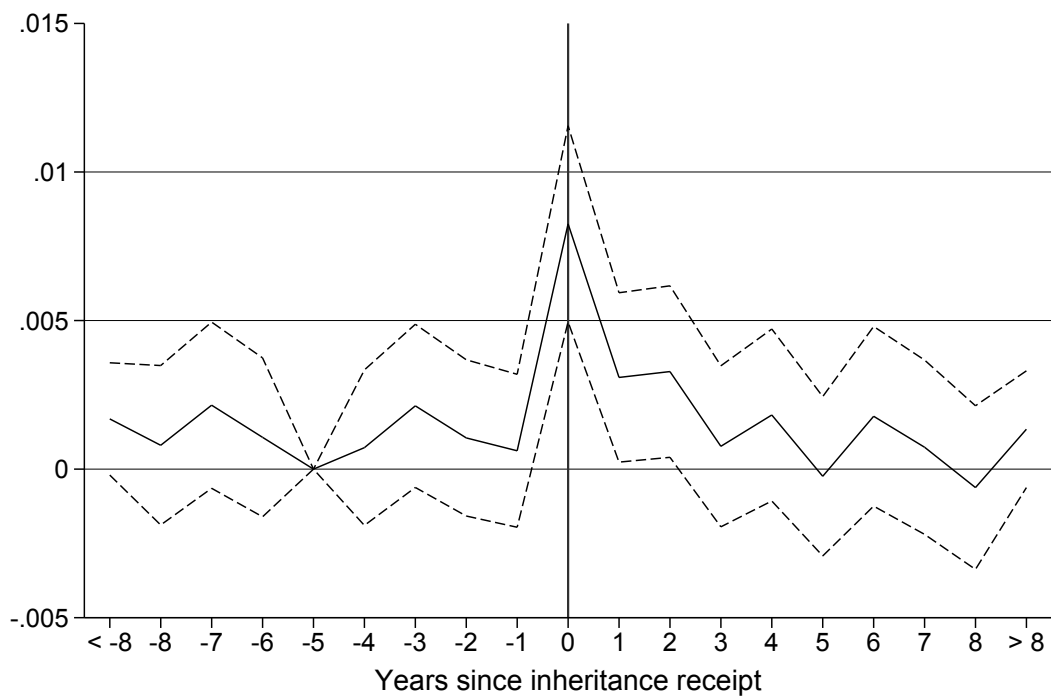
Table A6 – Inheritance and men’s entry into self employment: subsamples

	(1)	(2)	(3)	(4)	(5)	(6)
	1945-1964	1965-1974	1975-1984	1985-1994	1995-2004	2005-2014
<b>Panel A: 2 years before inheriting</b>						
Inheritance	0.0334** (0.0165)	0.0199** (0.00868)	0.00630 (0.00471)	0.00701** (0.00338)	0.00398 (0.00272)	0.00265 (0.00428)
Obs.	692	1239	2256	3696	4111	2400
Mean dep. var.	0.029	0.013	0.008	0.006	0.005	0.010
<b>Panel B: without multiples of 10 - ages</b>						
Inheritance	0.0384** (0.0156)	0.0175** (0.00886)	0.00589 (0.00460)	0.00625* (0.00346)	0.00363 (0.00271)	0.000527 (0.00382)
Obs.	1297	2391	4436	7005	7438	3505
Mean dep. var.	0.015	0.011	0.007	0.006	0.005	0.009
<b>Panel C: without multiples of 10 - years</b>						
Inheritance	0.0449** (0.0180)	0.0170* (0.00927)	0.00141 (0.00399)	0.00460 (0.00329)	0.00438 (0.00288)	0.00242 (0.00387)
Obs.	1294	2372	4405	6979	7404	3556
Mean dep. var.	0.018	0.011	0.007	0.006	0.005	0.008

*Note:* Panel A of the table shows the results of the estimation of a linear probability model where an indicator of entry into self-employment is regressed on a variable taking value 1 when an individual receives an inheritance and 0 in the two years preceding the receipt. Panels B and C show the results of the estimation of the same model as in Panel A of Table A3, excluding from the sample observations corresponding respectively to ages and years which are multiples of 10. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014.

Figure A5 – Men’s rate of transition to self-employment by years since inheritance receipt



*Note:* the figure plots the estimates of a linear probability model in which an indicator of current entry into self-employment is regressed on a set of 18 dummies indicating time to inheritance receipt. The reference is taken 5 years before the receipt (excluded dummy). Additional controls include a full set of dummies for individuals’ age. The sample includes salaried or unemployed men aged 20-64. Standard errors of the estimates are clustered at the household level and 90% confidence intervals are plotted in dashed lines.  
*Source:* French Wealth Survey, 1998-2014.

Table A7 – Wealth shocks and entry into self-employment: gender differences

	(1) No weights	(2) Reweighted: years uniformly distributed	(3) Reweighted: women's years' distribution calibrated on men's
<b>Panel A: inheritance (1945-2014)</b>			
Men	0.00735*** (0.00177)	0.0155*** (0.00492)	0.00735*** (0.00177)
	N=29052 m=0.008	N=29052 m=0.011	N=29052 m=0.008
Women	0.000971 (0.00113)	0.00105 (0.00183)	0.00123 (0.00121)
	N=24866 m=0.004	N=24866 m=0.005	N=24866 m=0.004
p-value of men > women	0.001	0.003	0.002
<b>Panel B: housing prices (1975-2014)</b>			
Men	0.00579 (0.00451)	0.00919* (0.00520)	0.00579 (0.00451)
	N=588848 m=0.011	N=588848 m=0.012	N=588848 m=0.011
Women	-0.00258 (0.00307)	-0.00258 (0.00331)	-0.00239 (0.00307)
	N=527916 m=0.004	N=527916 m=0.005	N=527916 m=0.004
p-value of men > women	0.062	0.028	0.067

*Note:* the table shows the results of the estimation of equation (1) (panel A) and (2) (panel B) with a linear probability model on the Wealth Survey data and the Labor Force Survey data respectively. Both samples include all years available in each data source (1945-2014 for Panel A and 1975-2014 for Panel B). The first and second rows of each panel show the results obtained on the subsample of men and women respectively. The third row indicated the p-value of the one-tailed test of the hypothesis that the coefficient for men is higher than the one for women. In the second column the sample is reweighted so that observations are uniformly distributed between years for both men and women, and in the third column the sample is reweighted so that women's observations are distributed between years in the same way as men's observations. Regressions include the same controls as in Table A3. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Wealth Survey, 1998-2014 (Panel A) and French Labour Force Survey, 1975-2014 (Panel B).

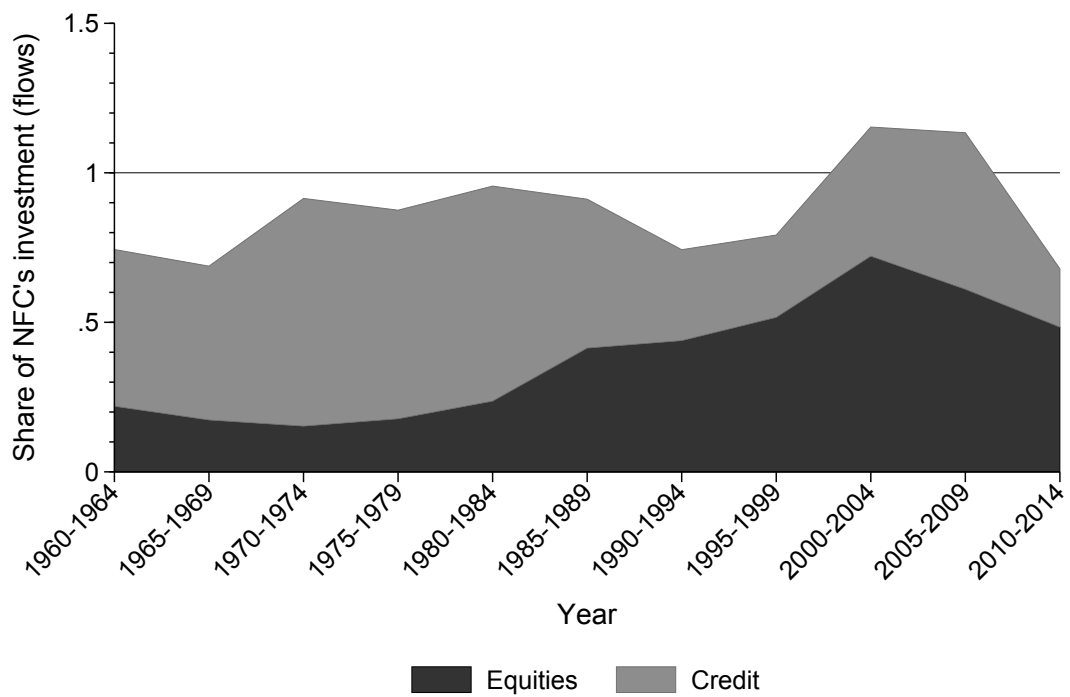
Table A8 – Wealth shocks and entry into self-employment: employment patterns

	(1) Has employees (1st year)	(2) Has employees (2nd year)
Owner $\times\Delta p$	0.188 (0.207)	-0.109 (0.363)
Obs.	4437	1517
Mean dep. var.	0.347	0.384

*Note:* the table focuses on years 1975-1994 and on the sample of salaried or unemployed men aged 20-64 who become self-employed the next year. It shows the results of the estimation of a linear probability model where an indicator that the individual has at least one employee the next year is regressed on the 5-year growth rate of real-estate prices interacted with an indicator of full homeownership. The second column focuses on the subsample of individuals who are observed for another two years in the labor force survey and who stay self-employed at least two years, and estimates the same model as in column (1) replacing the outcome variable with a dummy indicating that the individual has at least one employee 2 years after. Additional controls are the same as in Table A3. Standard errors clustered at the household level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5% and 10% levels respectively.

*Source:* French Labour Force Survey, 1975-1994.

Figure A6 – Debt to investment ratio for NFCs since 1960



*Note:* the figure shows the ratio over time of the flow of credit (F4) and equities (F3+F5) of all institutional sectors to non-financial corporations (S10), to the gross fixed capital formation (GFCF) of S10.  
*Source:* French National Accounts in bases 1962, 1970, 1980, 2000 and 2010.

## **B Reform on barriers to entry: Law for Economic Initiative (JORF 5 aout 2003 p 13449)**

Here we present the four channels through which *Loi Dutreil* favored as of 2003 business formation and transition from salaried work to entrepreneurship. For each of them we describe the specific impact of the law following Agence France Entrepreneur:<sup>44</sup>

### **Making Firm Creation, Simple and Quick**

Lowered capital requirement of firm creation. The minimum amount of capital required to start a *Société à Responsabilité Limitée* was suppressed. (Article 1)

Simplified administrative process of firm creation. Entrepreneurs could start all the administrative process of firm creation as soon as they had filled the initial tax form, even though they hadn't obtained a formal registration yet (which they were required to before). (Article 2)

Allowed online firm registration. (Article 4)

Allowed entrepreneur's home to be business residence. (Article 6)

Increased protection of entrepreneurs' personal wealth. Their home couldn't be confiscated anymore. (Article 8)

### **Making Transition of Salaried Workers toward Entrepreneurship Smoother**

Decreased social contribution for transitioning entrepreneurs. Salaried workers who benefited from social security did not have to pay for a year social contributions linked to their new entrepreneurial activity anymore. (Article 16)

Simplified access to leave of absence for business creation. It lowered requirement on workers seniority to benefit from such leaves, and reduced the delay granted to employers to respond. (Article 17)

Created a right for part time work dedicated to business creation (Article 17)

Reduced cotisation to health or maternity insurance of part time entrepreneurs. (Article 22)

Created a presumption of independency to describe relationship between entrepreneurs and firms they contract with. (Article 23)

Relaxed conditions of salaried workers exclusivity clauses. As long as workers were loyal to their employees, their employers couldn't prevent them from starting their own business or take over

<sup>44</sup><https://www.afecreation.fr/cid23625/loi-pour-l-initiative-economique-loi-dutreil-tableau-recapitulatif.html?&pid=336>



an existing firm anymore. (Article 15)

### **Financing Economic Initiative**

Increased incentives to invest in firms. (Interest obtained on Livret d'épargne-entreprise were now exempt of taxes even in the first 2 years if funds were reinvested in a firm) (Article 25)

New Investment fund. *Fonds d'investissement de proximité*. Local investment funds were created to target local firms and young ones. (Articles 26 and 27)

Fiscal incentives to invest in firms. Investment in non traded firms or startups were offset against tax. (Article 29)

### **Facilitate companies development and transfers of businesses**

Lowered taxes on gains related to cessation of business: it increased the sales threshold under which entrepreneurs were exempted. (Article 41)

Facilitated companies buyouts : 25 % of interests on debt taken to buy stocks or companies shares were offset against taxes. (Article 42)

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