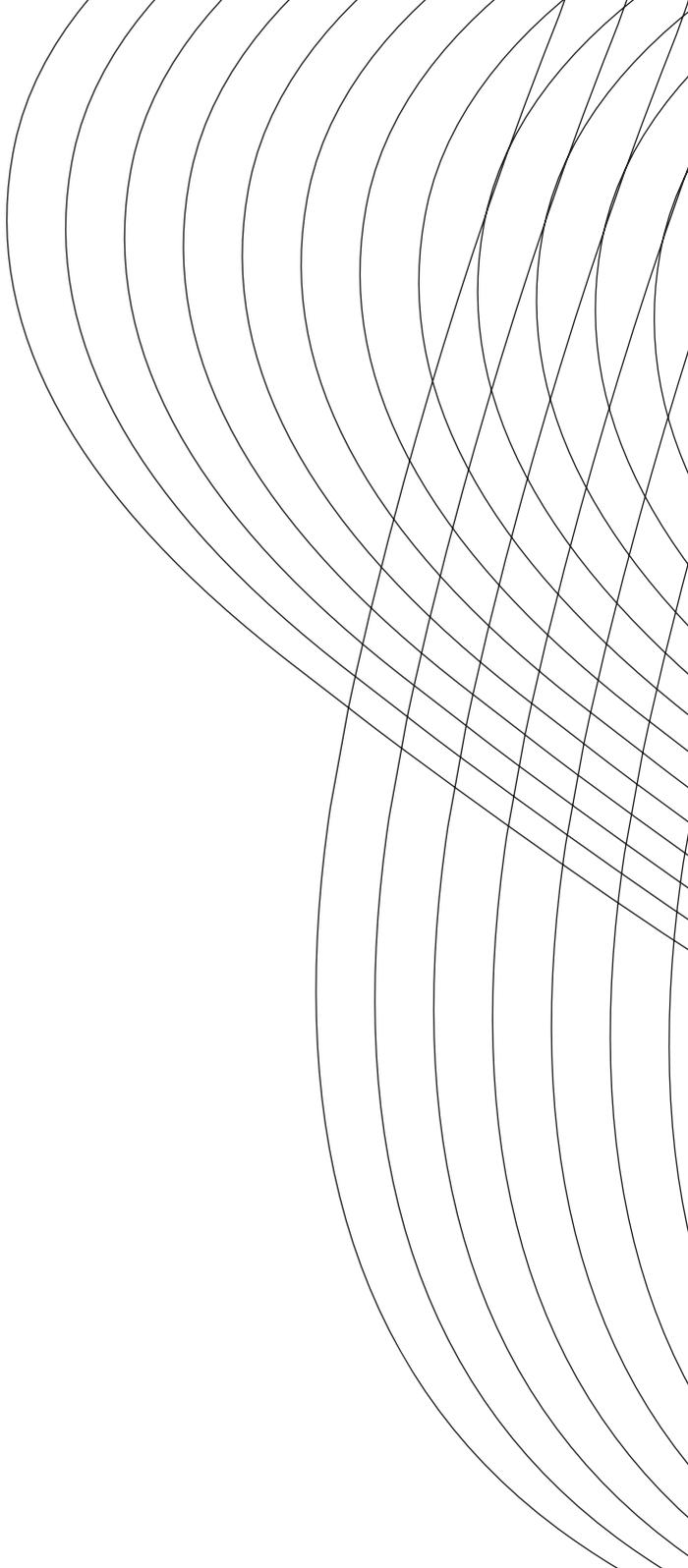
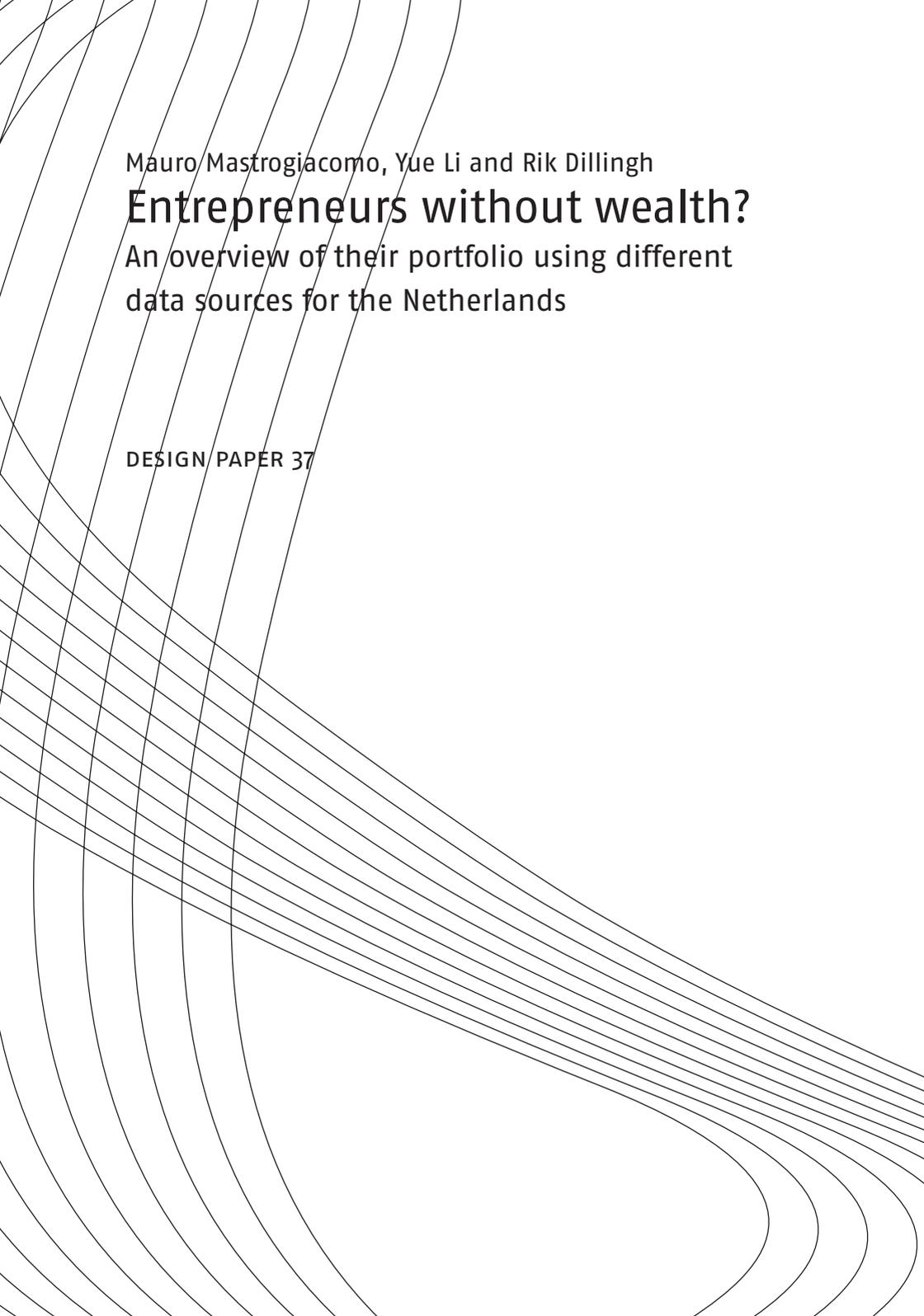


*Mauro Mastrogiacomo, Yue Li
and Rik Dillingh*

Entrepreneurs without wealth?

An overview of their portfolio
using different data sources for
the Netherlands





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DESIGN PAPER 37



Netspar

Network for Studies on Pensions, Aging and Retirement

Colophon

Design Papers is a publication of Netspar
March 2015

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B-more Design
Bladvulling, Tilburg

Printing

Prisma Print, Tilburg University

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PREFACE

Netspar seeks to stimulate debate on the effects of aging on the behavior of men and women, (such as what and how they save), on the sustainability of their pensions, and on government policy. The baby boom generation is approaching retirement age, so the number of people aged 65 and over will grow fast in the coming decades. People generally lead healthier lives and grow older, families have fewer children. Aging is often viewed in a bad light since the number of people over 65 years old may well double compared to the population between 20 and 65. Will the working population still be able to earn what is needed to accommodate a growing number of retirees? Must people make more hours during their working career and retire at a later age? Or should pensions be cut or premiums increased in order to keep retirement benefits affordable? Should people be encouraged to take personal initiative to ensure an adequate pension? And what is the role of employers' and workers' organizations in arranging a collective pension? Are people able to and prepared to personally invest for their retirement money, or do they rather leave that to pension funds? Who do pension fund assets actually belong to? And how can a level playing field for pension funds and insurers be defined? How can the solidarity principle and individual wishes be reconciled? But most of all, how can the benefits of longer and healthier lives be used to ensure a happier and affluent society? For many reasons there is need for a debate on the consequences of aging. We do not always know the exact consequences of aging. And the consequences that are nonetheless clear deserve

to be made known to a larger public. More important of course is that many of the choices that must be made have a political dimension, and that calls for a serious debate. After all, in the public spectrum these are very relevant and topical subjects that young and old people are literally confronted with.

For these reasons Netspar has initiated Design Papers. What a Netspar Design Paper does is to analyze an element or aspect of a pension product or pension system. That may include investment policy, the shaping of the payment process, dealing with the uncertainties of life expectancy, use of the personal home for one's retirement provision, communication with pension scheme members, the options menu for members, governance models, supervision models, the balance between capital funding and pay-as-you-go, a flexible job market for older workers, and the pension needs of a heterogeneous population. A Netspar Design Paper analyzes the purpose of a product or an aspect of the pension system, and it investigates possibilities of improving the way they function. Netspar Design Papers focus in particular on specialists in the sector who are responsible for the design of the component.

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The views expressed in this paper are those of the individual authors and do not reflect official positions of any affiliated institution.

ENTREPRENEURS WITHOUT WEALTH? AN OVERVIEW OF THEIR PORTFOLIO USING DIFFERENT DATA SOURCES FOR THE NETHERLANDS¹

Abstract

(Solo) Entrepreneurs are mostly excluded from second pillar pensions in the Netherlands. To generate substantial additional income after retirement, they largely depend on voluntary participation in third pillar pension products or on other private arrangements (e.g. homeownership). Whether they will reach retirement with substantial financial resources is an empirical issue. In this study we explore three main components of the disposable wealth of entrepreneurs: financial wealth, business equity and home equity and project this to the future. We also describe their participation in the second pillar. We use different datasets, some of them novel to academic research. The descriptive evidence and the forecasts based on various reduced-form models are meant to estimate the potential post-retirement wealth holdings and the income that entrepreneurs will be able to generate from their wealth. We show that there is a large heterogeneity in wealth holdings across generations, that business equity is generally low, and that only some entrepreneurs, under favorable macroeconomic conditions, will achieve the same level of wealth as currently older entrepreneurs.

1 Part of the data used in this study have been obtained from the SME and entrepreneurship research program, financed by the Dutch Ministry of Economic Affairs and administered by Panteia. The mortgage data are those collected in the DNB loan level data initiative. The views expressed in this study do not necessarily represent those of the institutions involved.

1. Introduction

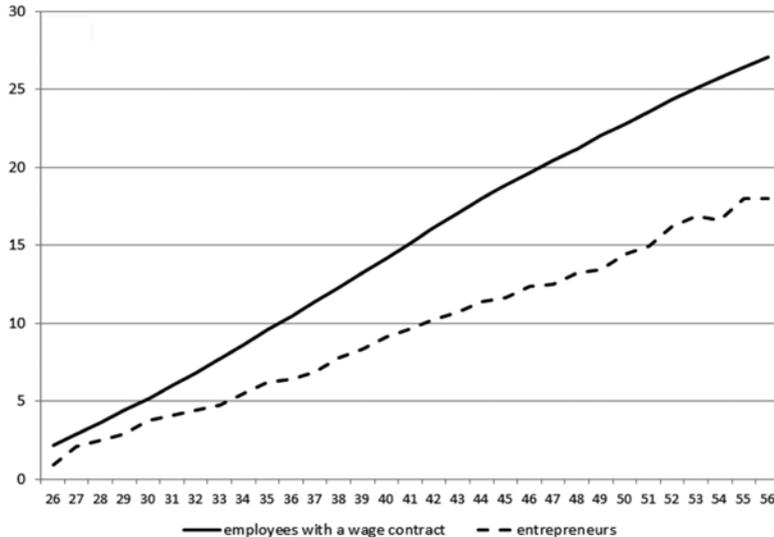
In this study we examine whether there is descriptive evidence that (solo) entrepreneurs² will approach retirement with substantial wealth holdings. In the Netherlands this is particularly relevant because many entrepreneurs may need to compensate their lack of a second pillar pension (Van der Lecq and Oerlemans (2009)). Also in other countries, such as Italy and the UK, most entrepreneurs do not contribute into a second pillar pension scheme. This means that today's entrepreneurs mostly depend for their pension wealth – aside from their base state pension (AOW) – on pension rights that they accumulate in salaried positions prior to their current occupation. For the Netherlands, this has resulted in a substantially lower accumulation of pension rights for entrepreneurs in the second pillar, as shown in Figure 1.1. At age 55 the difference in years of contribution is already about 12.³ But are entrepreneurs also behind in terms of wealth accumulation when it comes to private wealth? Analyzing the disposable wealth holdings of entrepreneurs is complex. This study compares different datasets to gain an understanding of this matter.

Empirical research has struggled to come up with a comprehensive description of the wealth holdings of entrepreneurs. That is firstly because wealth holdings are difficult to properly trace in the Netherlands (consider, for instance, the absence of data concerning mortgage-linked savings deposits) and secondly because entrepreneurs are a difficult group to

2 With the term entrepreneurs from now on we mean both solo entrepreneurs and those with co-workers/employees, unless stated differently

3 Due to early retirement schemes in the past, it would be misleading to look at salaried employees beyond this age. The difference may increase even further in the subsequent twelve years before the state pension kicks in.

Figure 1.1: Accumulated years of contribution in the second pillar



Source: DHS, period 1994–2008

study. Indeed, most datasets that contain information about wealth do not properly define the entrepreneurs. For instance, survey definitions often refer to entrepreneurs as persons who have been entrepreneurs since a given number of years (see DNB (Dutch National Bank) Household Survey (DHS) for the Netherlands and National Longitudinal Surveys for the US), while registered data elicit this information from tax records (the Income Panel Study, known as *IPO*, *Inkomens panelonderzoek*) or use very specific definitions⁴ (as in the Labor Force Survey (EBB, *Enquête*

4 CBS defines a freelancer as a person whose main occupation is that of supplying personal labor at own cost and risk in a self-owned company or firm, or a person who exercises a profession without staff support. As from 2011, CBS includes under solo entrepreneurs also persons who sell products and not only labor. In 2012, the first definition covered 760,000 solo entrepreneurs, while 170,000 persons fell under the second definition.

Beroepsbevolking) of CBS, see Van As et al., 2013). Furthermore, in definitions of entrepreneurs this group tends to be very small (5–7% of the population under scrutiny or 10–15% of the labor force in most datasets) though increasing over time (Bosch et al., 2012). To have a large number of entrepreneurs, one needs to use very large datasets (for instance, the Income Panel Study combined with the Pension Claims Data (*Pensioenaanspraken*) or EBB data of CBS). Ultimately, when a large enough population of entrepreneurs is available, it tends to be very heterogeneous. Finally, the heterogeneity can be endogenous with regard to wealth, as some entrepreneurs are wealthy almost by definition (e.g. farmers, as they must own a farm) while others not necessarily (e.g. consultants).

The available literature suggests that older entrepreneurs can compensate their relative lack of second pillar pension savings, compared to salaried employees, with other wealth sources (CBS, 2011). However, the CBS study focuses on one specific cohort only. This does not necessarily mean that today's entrepreneurs will be rich as they become older, since this may simply depend on cohort effects. From an academic point of view, the current wealth position of entrepreneurs is a relevant piece of knowledge. The literature, for instance, is divided on the causality between wealth and self-employment. Dunn et al. (2000) & Hurst and Lusardi (2004) find a positive but small effect of financial wealth on the transition to self-employment. Hamilton (2000) finds no evidence that self-employment improves the household financial position. Wealth accumulation may, on the other hand, be driven by the success of business owners and their higher saving rates. Hence, entrepreneurship may explain the high concentration of cross-sectional wealth (Gentry and Hubbard, 2004; Cagetti and Nardi, 2005). Also, entrepreneurs may intrinsi-

cally save more because of precautionary motives (Hurst et al. 2010). All of these studies are based on a single dataset or look at very specific definitions of wealth. From a policy point of view, proper assessment of the wealth holdings of entrepreneurs is of paramount importance, as these items are typically good predictors of future post-retirement wealth.

In the present study we are not directly concerned with causality, nor with the optimality of retirement choices. We aim at gathering better information, from different data sources, on the accumulation of wealth by entrepreneurs of different cohorts. Specifically we have two aims. The first is to create a better definition of their housing wealth, using administrative data that identify their saving deposits. This is a novel piece of empirical evidence never discussed before. Our second aim is to project the three wealth items under scrutiny to the future, thereby showing the sensitivity of future wealth to relevant macro-economic scenarios.

Our study is structured as follows. In Section 1 we describe the different data sources. Section 2 investigates home equity and projects several future scenarios. In Section 3 we discuss financial wealth and extrapolate it using a cohort model, plus we describe business equity and compare the results on housing wealth in Section 2 to those obtained in a longer panel. In Section 4 we review all these separate wealth items, but then only focusing on entrepreneurs. Our paper ends with a summary and conclusions.

1.1 Data sources

1.1.1 DNB loan level data

For our study of housing wealth we use the data collected by De Nederlandsche Bank (DNB), specifically the mortgage loan level

data (LLD) initiative. This collection is based on the residential mortgage-backed security (RMBS) template required by the European Central Bank for acceptance of securitized mortgages as collateral. The unique feature of the LLD initiative is that it covers all loans pertaining to each individual borrower and property. The RMBS versions of these data are also available for other European countries and are administered by the European Data Warehouse. However, only securitized mortgages are publicly available. DNB recently acquired data on all mortgages in the portfolio of the main 11 banks in the Netherlands, thus including the non-securitized part of the portfolio.

The LLD contains about 80% of all mortgage loans in the Netherlands (foreign banks and very small institutions are not excluded). It therefore corresponds perfectly with the sample of mortgagors, which constitute 90% of all homeowners in the Netherlands (4.2 million owner-occupied dwellings, of which 3.6 million are mortgaged, with some 3 million of these included in the data). The data were originally collected in the fall of 2012, with a follow-up every three months thereafter. At present the last collected wave is that of Q1-2014. We speak here of a panel dataset, where attrition appears when mortgagors close their mortgage (either because they repay the loan or because they shift to a new contract).⁵ The new dataset is thus the most detailed source of information on mortgages and housing wealth of mortgagors in the Netherlands. It contains about 5.6 million loans, and about 50 characteristics are reported for each mortgage. One of the characteristics recorded at origination is the self-employment status of the mortgagor, with the employment status at origination of the mortgage being based on the income

5 In the latter case the borrower does not disappear but receives a new identification number.

records that the borrower provides to the bank. The population of entrepreneurs in this sample is therefore large, but only a few background characteristics are available. Relative to the micro data available at Netherlands Statistics (CBS), the LLD provides precise information on mortgage type, origination and maturity, allowing for the first time an estimate of the saving deposits pledged to Dutch mortgages.

1.1.2 Financial wealth and business equity in IPO data

The IPO contains data on gender, age, marital status, income, homeownership, labor market status, and wealth. These data are obtained from official institutions such as municipalities and the Tax and Customs Administration. In the IPO, about 100,000 'key persons' are drawn from the Dutch population and followed over time. Data on all household members of the key persons are also available. The advantage of this dataset is that it has very low attrition (only death and migration of the key person). Also, the observed variables have low measurement error. Waves from 1978 to 2011 are at our disposal, but information on wealth is only available since 2004. We concentrate on age groups that are typically of working age, from 26 to 65. We define and select the breadwinner (the reference person in a given household) as the oldest male person. If a household does not contain any males, we take the oldest female person as the breadwinner. Next, a breadwinner is regarded to be an entrepreneur if he/she has non-missing income records from self-employment business activities. According to the IPO for 2011, entrepreneurs constituted 12.1% of the sample population of households (8,349 out of 68,510), while salaried employees constituted 55.1% (37,734 out of 68,510). In addition, 82.1% (6,852 out of 8,349) of entrepreneurs owned a primary residence, while 84.1% (5,763 out of 6,852) of

those who owned a primary residence had taken out a mortgage loan. In comparison, about 77.5% (29,255 out of 37,734) of the salaried employees owned their primary residence, while 94.5% (27,640 out of 29,255) of them had taken out a mortgage loan to finance their home.

Financial wealth in the IPO is the sum total of bank and savings accounts, bonds and stocks, minus financial debts. The value of housing wealth is also available, but for this we examine more detailed DNB data (see below). Finally, business equity is reported. This is equal to the difference between assets and liabilities pertinent to the company or the freelance activity. This means that the IPO data contain both the wealth of entrepreneurs in SMEs and that of entrepreneurs without a company (solo entrepreneurs). This last group is the focus of the Panteia-EIM panel.

1.1.3 Panteia-EIM Panel

The Solo-Entrepreneurs Panel of Panteia/EIM (referred to as the EIM panel in the rest of this study) is a telephone survey that aims to include 2,000 solo entrepreneurs, who are then followed on a yearly basis. The panel study is executed by Panteia/EIM Business and Policy Research as part of a long-term research program on SMEs. The Solo Entrepreneurs Panel is repeated annually, with a frequency of two waves per year. Panel attrition is handled by filling up the sample to two thousand respondents once a year. The response rates and respondents' involvement in panels such as these are generally higher than that of random surveys⁶.

6 We only use the 2009–2010 waves. In 2012 the EIM panel moved to an internet questionnaire. This lowered the first response rate, which is nonetheless still higher than that of most other internet surveys in the Netherlands.

To obtain this sample, firms were selected from a company database which contains more than 95% of all Dutch companies. Firms with only one employed person were approached according to a stratified sample plan in all economic sectors, with oversampling in the service sector. All successfully contacted firms were screened according to the following requirements in order to determine whether the respondent was a genuine solo entrepreneur: 1) engaging in entrepreneurial activities; 2) holding a private limited liability company or a sole tradership; 3) no additional employees; 4) no fellow business partners; 5) no substantial professional involvement of family members in the business; 6) mainly engaged in selling own knowledge skills and abilities instead of goods. If respondents failed to meet one of these criteria, they were excluded from further analysis. The total response rate in 2009 and 2010, including screen-outs, was about 49%, while the net response rate was about 29%.

The version of the data used here was further enriched using CBS wealth records. Using Chamber of Commerce data, most sole practitioners (about 80%) were linked to the IVB (*Integraal-Vermogensbestand*, the wealth files of CBS) for the years 2007 to 2010. This is the same data source that is used to link wealth items to the IPO data. It contains information derived from all wealth tax records in the Netherlands. This means that we study EIM panel members by examining their CBS business wealth holdings.

2. Housing wealth in the DNB loan level data

To get a detailed look in the home equity portfolios of entrepreneurs, we distinguish the different components of home equity (HE), using the DNB version of the RMBS loan level data (LLD). We quantify down payments, repayments, standard savings deposits (SSD)⁷, the appreciation resulting from price effects, and the take-up of home equity. The only item that we are not able to identify are the additional prepayments into savings deposits (SD) that a mortgagor can transfer either at the onset of the mortgage or at later dates.

In the Netherlands both SSD and repayments are typically estimated using either survey data (DHS, SEP), micro register data (IPO), or aggregated statistics from the Dutch Association of Insurers (*Verbond van Verzekeraars*, VVW). Administrative microdata on SSD are not available, as banks do not retain this information and insurers cannot provide it at loan level. The information presented here is thus novel. Also, we base the property evaluation mostly on the value stated by an external assessor, whereas most other sources use values for property tax purposes or self-assessments.

2.1 The different components of housing wealth

We isolate the following components of housing wealth:

1. *repayments* (REPAY) = positive difference between original and current principal⁸

7 We replicate here the ECB template definition of savings deposit (BEW/SEW/KEW – *kapitaalverzekering eigen woning*): the accumulated sum of periodic transfers and interest on these transfers that is typically maintained under an insurance policy, not intended to repay the principal in each period but only at maturity. This is typically referred to as a *savings fund* or *capital sum*.

8 We do not observe when repayments take place.

2. *down payments* (DP) = positive difference between original valuation (OV) and original principal (ORIG)
3. *appreciation or depreciation* (APP) = change in value due to a price effect
4. *home equity take-up* (TAKE) = negative difference between original and current principal or between original value and original principal.

Home equity (net of prepayments in the SD) is then equal to the difference between current value⁹ (CV) and current outstanding debt (OUT) plus the SSD. So the following equation can then be constructed:

$$\begin{aligned}
 CV &= OV + APP; \quad OV = DP + ORIG; \quad OUT = ORIG + TAKE - REPAY; \\
 \mathbf{HE} &= CV + SSD - OUT = DP + ORIG + APP + SSD - ORIG - TAKE + REPAY = \\
 \mathbf{DP + APP + SSD - TAKE + REPAY} & \qquad \qquad \qquad (1)
 \end{aligned}$$

The above decomposition states that home equity is equal to the sum of down payments, appreciation, the SSD and debt repayments, minus home equity take-up. Imputing SSD in LLD is straightforward, though some records miss information about the payments due. The SSD is only computed for saving mortgages and life insurance mortgages. These represent 15% and 10% respectively of the approximately 5.5 million loans that we observe. For saving mortgage we assume the mortgage rate to be equal to the interest matured on the SSD. While this is the case for the saving mortgage, it should not be the case for the life

9 The external valuation of the house is typically determined at the time of loan origination. However, as interest rates depend on the LTV, there is an incentive to revalue the property if that increases in value. In the data it is not possible to identify when the external valuation was made, but the valuation date is reported and the current and original values always match the development in prices as reported by CBS.

insurance mortgage. We do not impute SSD for mortgages with an investment portfolio, which constitute 5% of all loans¹⁰.

The classification of mortgage type is essential to the imputation of the SSD and the repayments; this is again additional information relative to administrative data.

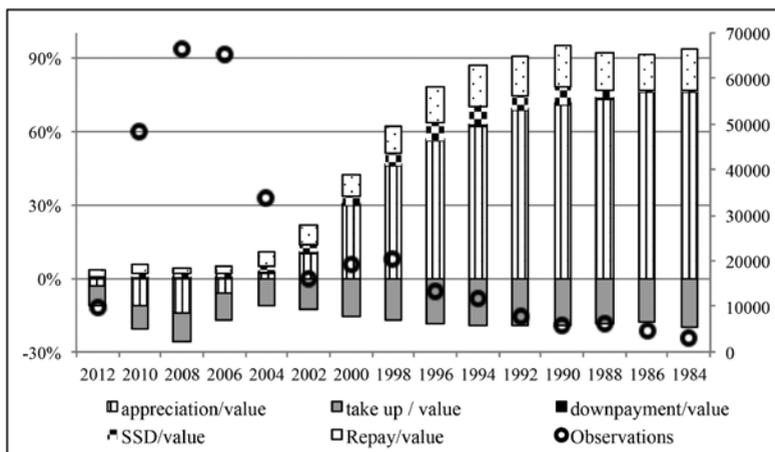
The starting point for the calculation of the SSD is a standard annuity scheme. As we observe principal (P), interest rate (i), and duration or length (d), we can then calculate both the monthly interest (p) and the savings premium (s), the discount rate (r) and the cumulated amount in the SSD, where:

$$p = P * i / 12, \quad r = \frac{1}{1+i}, \quad s = \frac{\frac{P}{(1+i)^d}}{\frac{1-r^d}{1-r}}, \quad SSD_{\tau} = \sum_{t=1}^{\tau} s(1+i)^t$$

The results of the imputation exercise allow producing more disaggregated evidence than was previously possible and to verify existing estimates. In Figure 2.1 we plot, among others, the ratio of SSD to current property value (where we have updated the current value from the valuation year using a price index; overall we underestimate the SSD as we assume no prepayments in the SSD) of starters. The figure shows SSD-to-value ratios of about 5%.

10 No 'standard' savings deposit is actually pledged to these accounts, so no computation can be applied. The value of the investment portfolio is not deterministic. By ignoring these portfolios we ignore a somewhat negligible amount of wealth. We do this not only because of the relatively limited amounts of such portfolios, but also because of their limited amounts (also depending on the relatively short vintage). Macrofigures suggest that savings deposits total about € 40 billion. Our back-of-the-envelope computations suggest that if investment portfolios were treated as savings mortgages, an additional € 9-10 billion would be added to these savings deposits. However, this is only an indicative figure. In reality, the deposits pledged to investment mortgages are likely to constitute not even half of this figure (due to the often low premiums and high costs, and to the recent crisis in asset values), thus less than 0.5% of the entire mortgage debt.

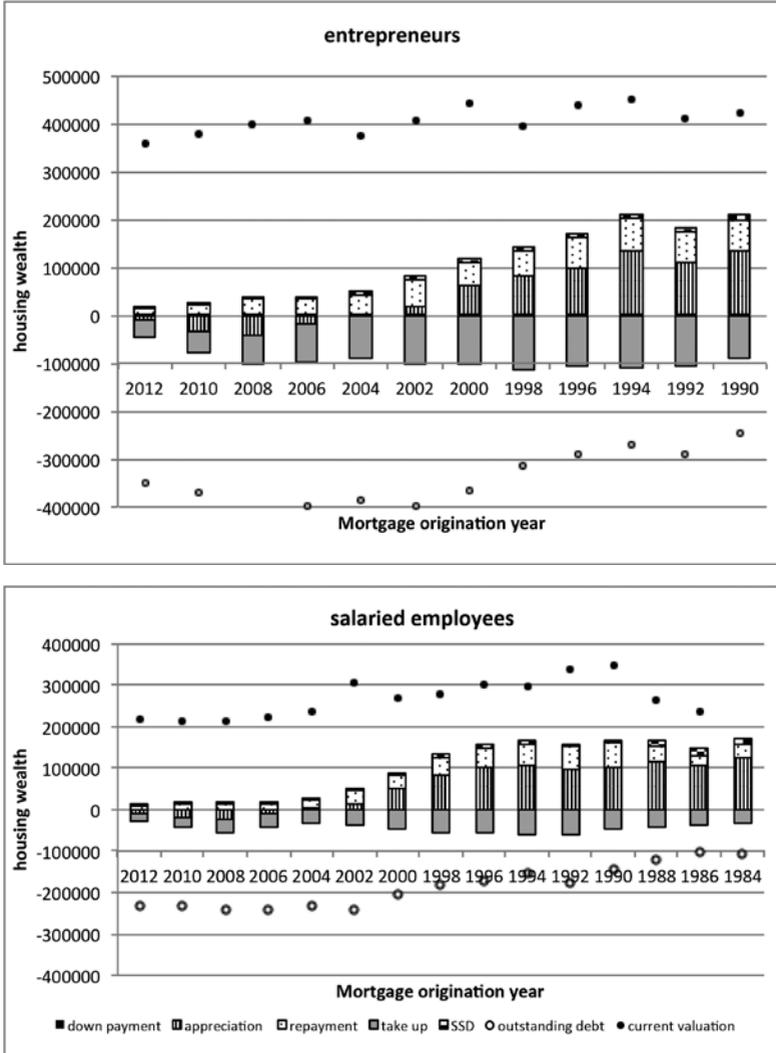
Figure 2.1: Relative value of components of housing wealth for starters.



Source: DNM LLD, Q4-2012

A shortcoming of this analysis is that starters are not easy to identify; after all, the year of purchase is not reported nor the origination year of the first mortgage. We proxy the concept of starters by looking at age at origination (<30) and age at maturity (<60) and eliminating those with two large home equities at origination. If we were to carry out the analysis including second-time mortgagors (that is, with no selection for starters), the figure would look completely different and show a positive HE also in 2012, when many “older” owners renegotiated their mortgages. This also explains the small sample size in the 1980s. Most mortgages originated during that decade have by now been renegotiated. We do not plot renegotiating homeowners because for them it is not possible to distinguish between appreciation and down payments (upon renegotiation, the appreciation is ‘reinvested’ in the mortgage).

Figure 2.2: Decomposition of housing wealth of starters



Explanatory note: Approximate sample size entrepreneurs = 45,000, salaried employees = 530,000. Source DNB LLD Q4-2012

Repayments are considerable, which is a new insight, while down payments are almost irrelevant (although this may partly depend on our definition of starter). Repayments are high for older mortgages (about 15%) but gradually drop to 2% in 2011–2012. Figure 2.1 shows that these are often offset by the take-up of home equity (either at the beginning of the mortgage contract or after). This indicates that banks still allowed mortgages in 2011 and 2012 that exceeded the value of the house by 8% on average.

Older cohorts have experienced substantial appreciation of their HE (about 75% of property value). Negative equities start from 2003–2004, as the take-up cancels out the upper bars in the graph. Was it not for repayments, then mortgages issued in 2002 would still be attached to properties without home equity.

2.2 Entrepreneurs

After sketching this general pattern, we now look at different cohorts of entrepreneurs, including not only starters but also renegotiators. The information about employment status at the origination of the mortgage is based on income records that the borrower provides to the bank; it is therefore not self-assessed¹¹.

11 We do not distinguish between pure solo entrepreneurs or hybrid solo entrepreneurs. We do not believe this to be an issue here, since the percentages of persons owning a primary residence and taking out a mortgage are quite similar between pure solo entrepreneurs and hybrid solo entrepreneurs. According to IPO 2011, 81.7% of pure solo entrepreneurs have a primary residence, while this percentage is 83.2% for hybrid solo entrepreneurs. And while 82.7% of pure solo entrepreneurs has a mortgage loan, this percentage is 87.7% for hybrid solo entrepreneurs. Our static analysis also ignores the shift from salaried employment to self-employment and vice versa, as we cannot control for this in the LLD dataset. However, as IPO shows, the transition rates are rather low in two consecutive years. The transition rate from salaried employment to self-employment (obtaining non-zero income from self-employment activities) averages about 1% in two consecutive years, and this rate is around 2% for the transition from self-employment to salaried employment. Therefore ignoring the shift is not a very restrictive assumption.

Employment status has many item non-responses, as not all originators provided this information¹². However, entrepreneurs with a mortgage are possibly a select sample in the sense that banks considered them creditworthy. The findings below thus apply only for mortgagors and should not be generalized. Employment status is available, however, for about 1.2 million mortgages. About 115,000 borrowers were entrepreneurs at origination (by extrapolation of the roughly 250,000 entrepreneurs that own a mortgage). The rest were mostly salaried employees, with only a negligible group being either unemployed or retired.

Among the 115,000 entrepreneurs, 45,000 are first-time mortgagors (according to the definition above, thus non-renegotiators); the rest renegotiated the mortgage at some stage. The relative decomposition that we show in Figure 2.1 for the whole sample does not differ much if we separate salaried employees from entrepreneurs. However, if we decompose the levels, some interesting differences appear. We first look at starters. Figure 2.2 shows the decomposition of housing wealth for starters according to their employment status. It shows that entrepreneurs who still hold the original mortgage have substantially more housing wealth than the salaried employees of the same cohort.

However, in the case of entrepreneurs, their negative home equity is also higher in more recent years. The 2012 peak in the number of entrepreneurs may show the limit of our classification of starters. Many mortgagors renegotiated their mortgage in 2012 before the new mortgage regulations (abolition of interest-only

12 This is due to a technical problem of several banks in transferring this information among different systems. We have no indication that this is related to the self-employment status, as the share of entrepreneurs within banks with full reporting is very similar to the overall average.

mortgages) came into play. Some of these renegotiated mortgages may have been classified as starters.

To prevent classification issues, we have carried out the decomposition for the entire sample, thus including both starters and those who renegotiated their mortgage. In Figure 2.3 we show also higher housing wealth of entrepreneurs relative to salaried employees. Some notable differences must be explained. First, older cohorts have similar home equities independent of whether they are starters or not. This is not the case for younger cohorts.

Second, the role of down payments has become extremely large in recent years. This is due to our definition of down payments. Those who renegotiate their mortgage with a new bank typically reinvest their home equity in the new mortgage when moving. Since 2004 this is actually compulsory as all capital gains on housing must be reported to the Tax and Customs Administration up to the amount of the mortgage deduction – which is very high in the Netherlands – unless these are reinvested in a new mortgage. When not moving, the property valuation is updated (in order to establish the current LTV, which is needed to redefine the mortgage rate) creating a large gap between mortgage and property value, which only looks like a down payment.

We focus now on some specific cohorts in order to understand these graphs. Entrepreneurs who contracted their mortgage in 1988 (upper graph of Figure 2.3) own a house with a current value of about € 400,000, with the principal balance of their current mortgage being roughly € 110,000. This principal is partly explained by a home equity take-up, either received at the origination of the contract or at a later time if the mortgage is increased. Some of these entrepreneurs have also repaid the original mortgage, with the average repayment being about

€ 40,000. Those with a savings mortgage have also built up a savings account of about € 27,000, and those who have made a down payment have invested about € 16,000. The largest component of their housing wealth is price appreciation (about € 280,000). In the end, the net outstanding debt balance is very low relative to current value. When we look at salaried employees of the same cohort, these numbers are smaller by about 30%.

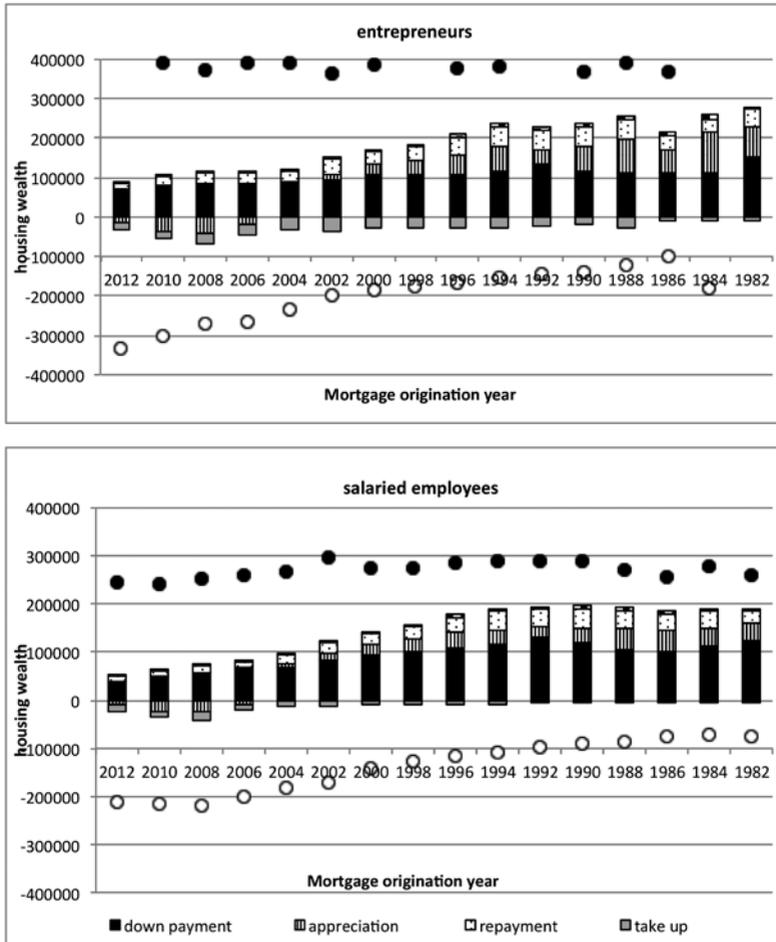
If we look at the 2009–2010 cohorts of entrepreneurs, we observe a very different situation. We see a larger down payment – possibly home equity from a previous mortgage – and depreciation of the house that is also one-third higher than for salaried employees. We also see virtually no repayment or SSD but a larger home equity relative to salaried employees.

A last piece of evidence is reported in Figure 2.4. There we show the housing wealth of entrepreneurs and salaried employees of different cohorts. It is interesting to note that entrepreneurs generally own houses with a higher current value as well as a higher outstanding debt balance. Prior to their normal retirement age of 65, they hold somewhat more housing wealth than the salaried employees. These differences are about € 50,000 both at age 63–64 and at age 61–62. The DNB LLD 2012 suggests that entrepreneurs have more home-related equity compared to salaried employees. For younger generations this is mostly due to the higher down payments (possibly related to previously accumulated home equity). But this says nothing about causality. Actually it may well be that entrepreneurs are asked to provide higher down payments when applying for a mortgage loan.

2.3 Extrapolating housing wealth

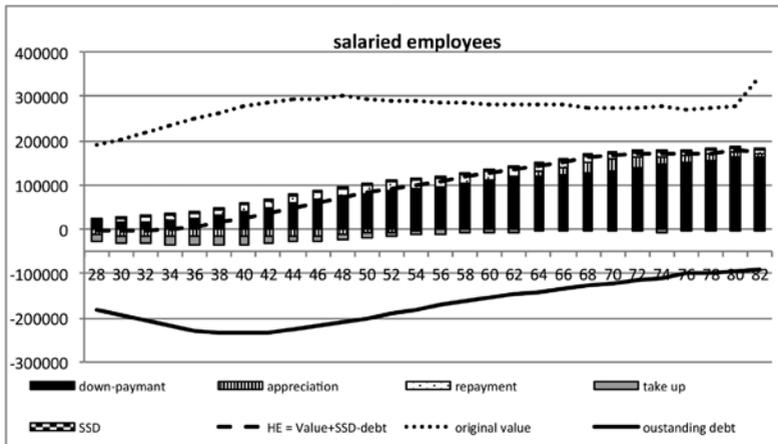
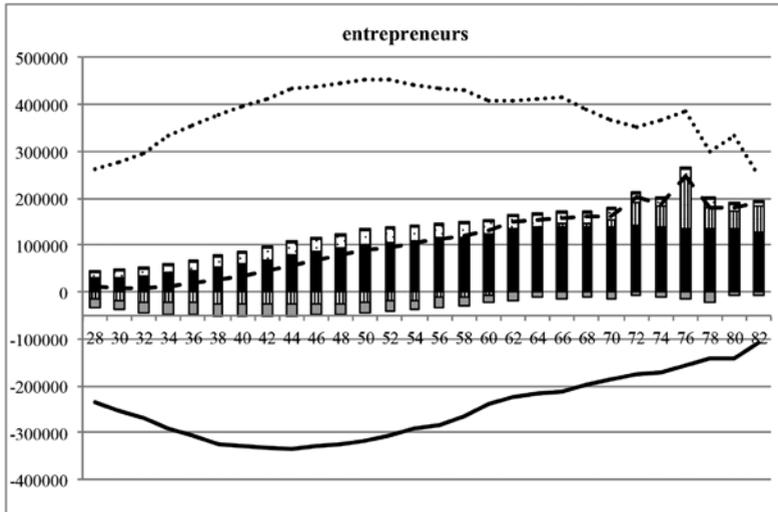
In this subsection we show a scenario analysis for the evolution of housing wealth. We want to understand what the home equity

Figure 2.3: Decomposition of housing wealth, whole sample



Explanatory note: Approximate sample size entrepreneurs = 115,000, salaried employees = 1,250,000. Source DNB LLD Q4-2012

Figure 2.4: Housing wealth of entrepreneurs by age



Explanatory note: Approximate sample size entrepreneurs = 115,000, salaried employees = 1,250,000. Source DNB LLD Q4-2012

of current entrepreneurs will be when they approach retirement. If we had panel data with a long enough T , we would estimate an econometric model that disentangles cohort age and time effects and that predicts wealth into the future. In a cross-section this is not advisable, nor is it in our case, when only two waves of data (3 months apart) are available. However, dealing with housing wealth allows us to use another strategy. Housing wealth of non-movers evolves in a relatively deterministic way. If we observe all needed mortgage characteristics, we only need to apply simple calculations in order to identify housing debt in the future. A few assumptions concerning the development of house prices and inflation are then enough to correctly calculate future home equity. This is also the case for persons who relocate but move to a house with a comparable value.¹³

There is a prominent behavioral effect on housing wealth that we can control for. Most mortgages in the Netherlands (about 70%) are in part made up by an interest-only loan. Owners of these products often voluntarily repay part of their mortgage before maturity. Between Q4-2012 and Q1-2013 about 5% of borrowers in the Netherlands voluntarily repaid part of their mortgage. The median repayment was about € 7,000 and the

13 This strategy is a misrepresentation of future home equity when one moves to a more expensive or cheaper house. Initially this does not affect housing wealth much, as the higher value of the house is often matched by a higher mortgage. However, while the mortgage has almost a deterministic development over time, property values do not. This means that if housing prices increase, the home equity of persons relocating to more expensive or cheaper house would be under- or overestimated). As we cannot track relocators, we cannot address this issue. Possibly this group will decrease in size due to the drop in transactions as a consequence of the crisis. Movers to more expensive dwellings may also be offset by movers to cheaper dwellings, so that the problem cancels out. Whatever the magnitude of this effect, we cannot control for it in our extrapolation.

Table 2.2 Estimation results for voluntary repayments

Repayments	Coeff.	Std. Err.	z
Share I/O	7810.031	147.6606	52.89
HE	47.67283	6.003098	7.94
Age	-177.87	4.991612	-35.63
Self-empl.	2424.325	223.1891	10.86
NHG	-3016.39	159.9379	-18.86
Constant	28588.79	517.9006	55.2
Selection equation			
Age	-0.00055	0.000107	-5.15
Fixed rate	0.202971	0.003762	53.95
Interest rate difference	6.171265	0.147541	41.83
Underwater	-0.62752	0.004593	-136.63
Constant	-1.86068	0.009352	-198.97
athrho	-0.23362	0.010777	-21.68
Insigma	9.87717	0.002897	3409.55

mean repayment € 15,000. In Table 2.2 we estimate a Heckman two-step model to analyze voluntary repayments.

As instruments we use an identifier for starters, one for underwater mortgages and one for the interest rate on mortgage. The latter explains repayment behavior as it allows arbitraging in a period of low interest rates on savings accounts. This can obviously also partly explain the amount being repaid. However, in order to pick this effect, we use the share of interest-only mortgages in total mortgages. The repayment is furthermore explained by current home equity, the age of the mortgagor, his/her occupation and whether the mortgage has a public guarantee. The results are all significant and show that larger repayments can be expected when the interest-only share is higher, the borrower is an entrepreneur, and the home equity

is higher. Based on these estimates, we carry out a Monte-Carlo simulation to determine future repayments.

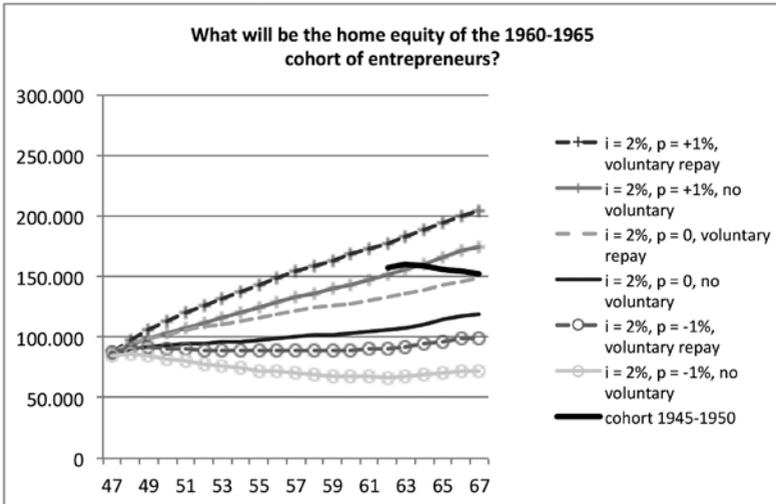
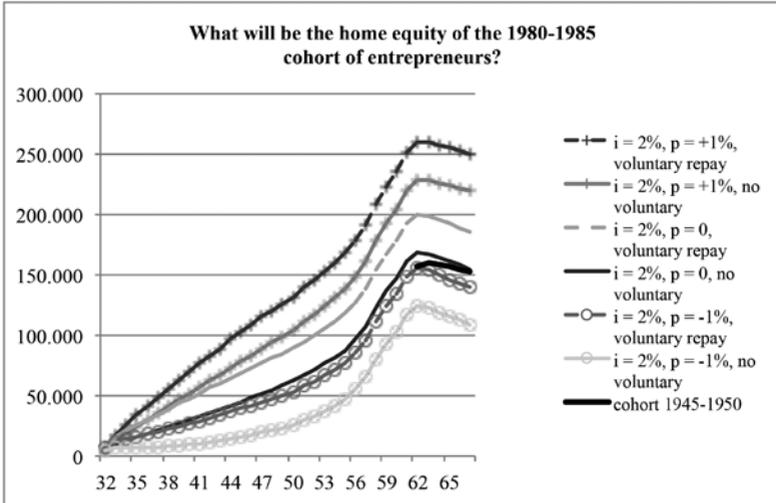
To determine the future level of home equity, we make the following assumptions:

1. Mortgages with contractual repayments behave deterministically. The simulation period is 40 years.
2. Voluntary repayments depend on a simulation based on a two-step model, based on observed repayments rather than on financial wealth.
3. The share of voluntary repayments will drop from 5% in 2013 to 2% in 2043. Inflation will be equal to 2% during the entire simulation period.
4. Mortgages will reach maturity no later than 30 years after origination. No voluntary repayments are allowed after that date if the mortgagor is no longer underwater. Before that date, repayments of the entire debt are allowed.
5. The interest rate on mortgage loans will remain constant over the entire simulation period (as if everyone opts for fixed interest).

Lastly, the scenarios are based on two variables: whether or not we allow voluntary repayments, and whether house prices remain constant or increase (decrease) by 1%.

The results of the simulation show that 20% of borrowers will never repay voluntarily, while most borrowers will make two to three voluntary repayments before retirement. On average, the total repayment amount prior to retirement will be approximately

Figure 2.5: Projections of home equity, different cohorts



Explanatory note: i = inflation, p = change in house prices

€ 30,000.¹⁴ In Figure 2.5 we plot the simulation results for two specific cohorts and compare their future pre-retirement housing wealth with that of mortgagors born between 1940 and 1945.

The results show that the cohort born in 1980–1985 will surpass the level of pre-retirement housing wealth of the cohort born in 1945–1950 if housing prices increase by 1% a year. If housing prices stay constant, this will still be the case when voluntary repayments are made. With falling house prices, their home equity would be € 10,000 to € 40,000 lower.

The 1980–1985 cohort has a very long simulation period. Technically speaking, it can profit from multiple repayments, more for instance than the cohort born 20 years earlier. Of course this should have an effect on their present and future savings, but these are not observed in our data; only the repayments are observed. Persons born in 1960–1965 will only surpass the level of housing equity of the older cohort under the two most optimistic scenarios. The larger the housing wealth shock due to the fall in house prices, the longer it takes to recover. In this sense, younger cohorts have more time to fix this problem and climb above water; they have also more often purchased a house after prices reached their peak. So 70% of those born in 1980–1985 and 21% of those born in 1960–1965 were underwater in 2013, while 20 years later only 9% (6%) are still underwater. This means that over time the relative distance between the two groups has become significantly narrowed.

¹⁴ In our simulation we keep factors such as the mortgage interest deduction (MID) constant. However, if a restrictive MID reform were to take place, this might lead to falling house prices. Also a less generous MID could translate into lower resources for voluntary repayments. As we cannot control for income in the main equation, we cannot address this concern in our simulation.

3. Evidence from the IPO dataset

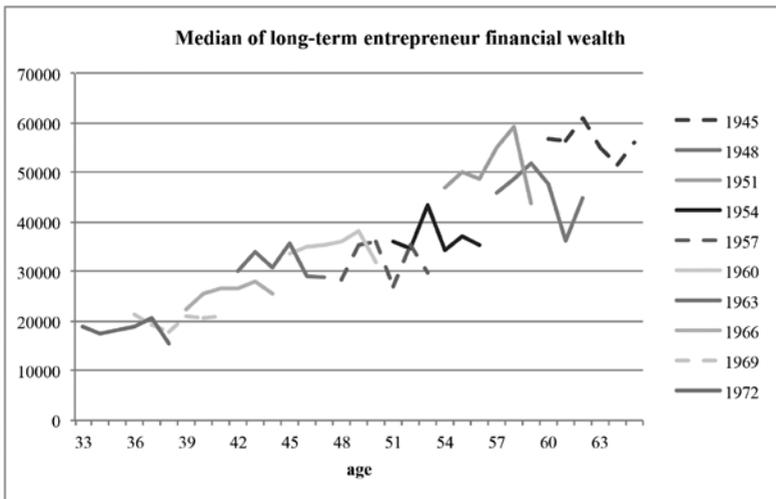
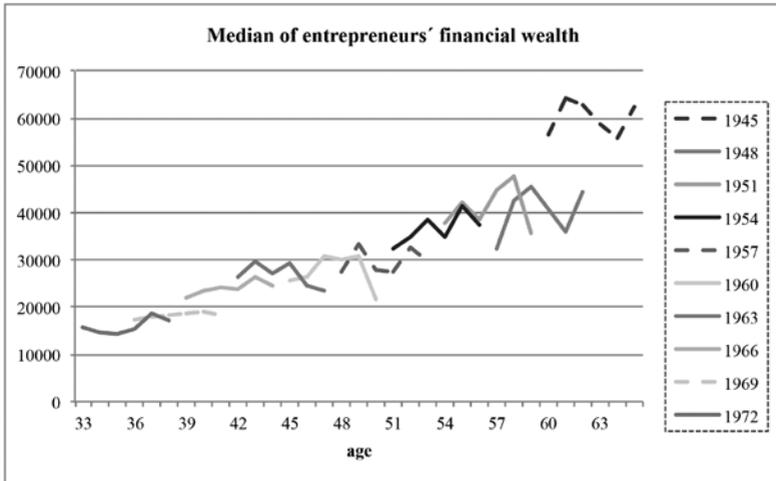
3.1 Financial wealth

In Figure 3.1 we show the financial wealth of entrepreneurs. In the IPO dataset the definition of entrepreneurs is based on income sources and tax records. In principle, it is possible that some are only short-term entrepreneurs. To filter out this possible contamination, we have selected a sample of regular entrepreneurs in the panel. We call them “long-term” entrepreneurs.

The figure shows that long-term entrepreneurs of most cohorts have higher financial wealth relative to the standard entrepreneurs belonging to the same cohort. This difference seems to be larger for older cohorts. This could reflect the fact that in the upper graph the observed entrepreneur may have spent relatively more time as a salaried employee, or it could result from a selection effect, whereby richer entrepreneurs survive longer in the group. With Figure 3.1 we only want to stress that the cohort-age differentials (the vertical distance between segments of a given age) are larger for the long-term entrepreneurs. This means that, at a given age, younger cohorts are less wealthy than older cohorts. It suggests that, when younger cohorts approach retirement, their financial wealth will be lower than that of currently retiring entrepreneurs. Upon studying the share of financial wealth to total wealth (results available from the authors), we have noticed that this increases over age, with no substantial differences between standard and long-term entrepreneurs.

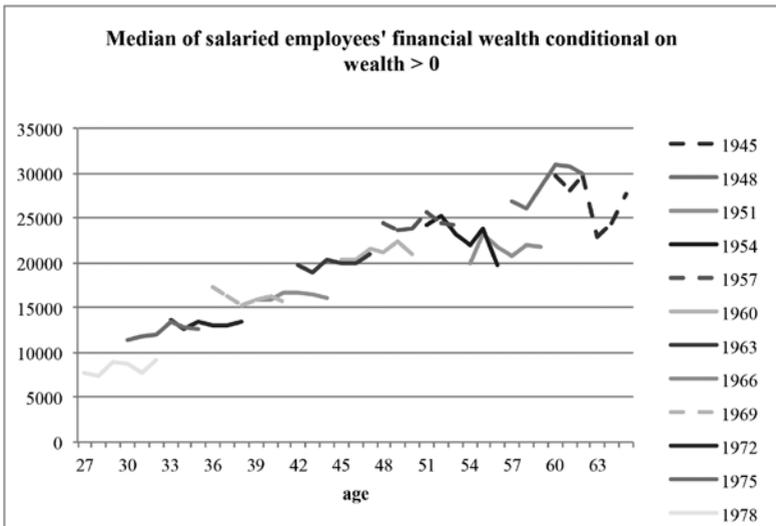
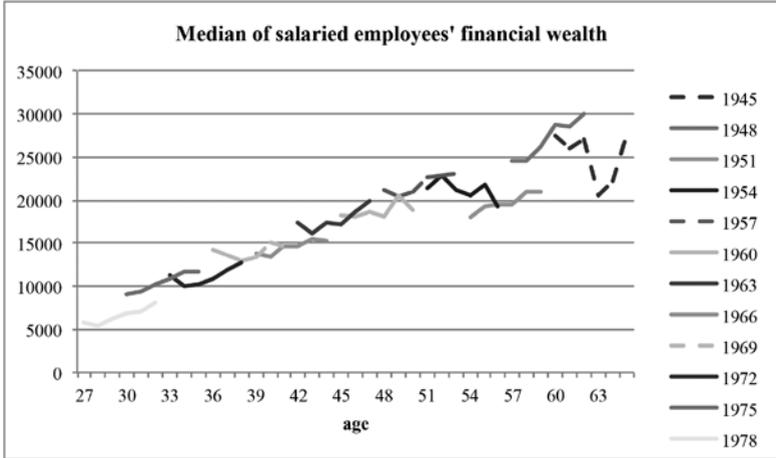
In the upper panel of Figure 3.2, we look at the financial wealth of salaried employees. This appears to be lower than that of entrepreneurs in all cohorts. Also the cohort-time effects are less pronounced than for entrepreneurs. If we condition

Figure 3.1



on financial wealth being higher than zero, then also younger salaried employees may end up with lower financial wealth prior to retirement relative to older cohorts.

Figure 3.2



There are different ways to explain this difference. It could be the result of a survival process (only the richest entrepreneurs survive), of a selection process (only the most skilled become entrepreneurs), of life-cycle planning (entrepreneurs need to

save more for their retirement, because most salaried employees already save in the second pension pillar), or of income differentials in the past (entrepreneurs were had higher income and saved more). For the purpose of this study we do not identify these different causes.

3.2 Extrapolation of future financial wealth

No deterministic development can be assumed for financial wealth (FW). Binding mortgage contracts, as shown above, make housing wealth behave somewhat deterministically under assumptions on price movements. To project financial wealth to the future, we need to rely on econometric models and on out-of-sample simulations (based on predictors that we take into account).

We have estimated the following model:

$$FW_{i,t} = \beta_0 + \beta_1 GDP_t + \beta_2 Age_{i,t} + \beta_3 Cohort_i + \beta_4 X_{it} + \varepsilon_{i,t} \quad (2)$$

where *GDP* (growth) captures business cycle effects,¹⁵ *Age* represents an age polynomial, *Cohort* are dummies for each year of birth, and *X* represents additional controls. We use a random effect model to estimate equation 2. The results are reported in Table 3.1.

The estimates show that GDP growth is positively related to wealth accumulation. We will exploit this significant relationship to simulate different future scenarios.

15 As an alternative, we also use the yearly returns of the AEX index to capture business cycle effects. The coefficient of the yearly returns of the AEX index is statistically significant and positive, and the sign and value of other explanatory variables are comparable to those in our preferred specification. Since GDP growth rate has higher explanatory power in terms of (partial) R-square, we decided on this variable for our regression model.

Table 3.1: Model estimates for financial wealth

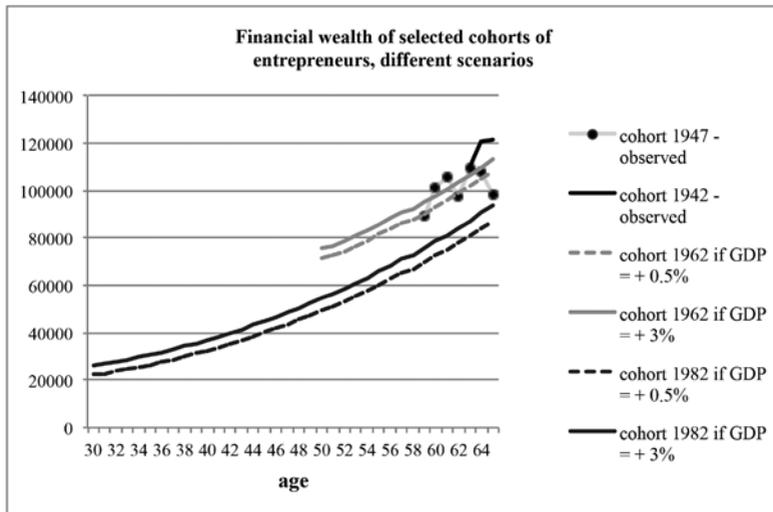
	salaried employees	entrepreneurs
Age	-1659.23***	-1110.68*
Age squared	29.10***	30.91***
GDP increase rate	747.94***	1335.32***
Personal net income	0.630***	0.223***
Cohort dummies	yes	yes
Family size	4971.43***	4564.29***
Number of income receivers	3552.43***	5240.56***
Dummy for living in high urbanization	-915.12*	-242.73
Dummy for immigration	-20280.43***	-22429.28***
Dummy for unmarried	8027.81***	13440.57***
Dummy for married	3886.32***	8757.54***
Dummy for widowed	8320.94***	19700.36***
Constant	16766.43***	19159.67
Observations	237675	49663

Explanatory note: *10% significance level (s.l.), **5% s.l., ***1% s.l.

Based on these estimation results, we have extrapolated the future financial wealth at current prices for all cohorts, under the assumption that GDP growth would be either 0.5% or 3% per year.

Figure 3.3 shows the development of financial wealth for selected cohorts of entrepreneurs under these assumptions. In the figure we also include the observed financial wealth of current elderly entrepreneurs. The figure shows that both the 1982 and 1962 cohorts will not reach the level of financial wealth of the 1942 cohort of entrepreneurs, not even in the most optimistic scenario. The 1962 cohort will get close to it, but the 1982 cohort will stay 20–30% below today's elderly in terms of financial wealth accumulation.

Figure 3.3

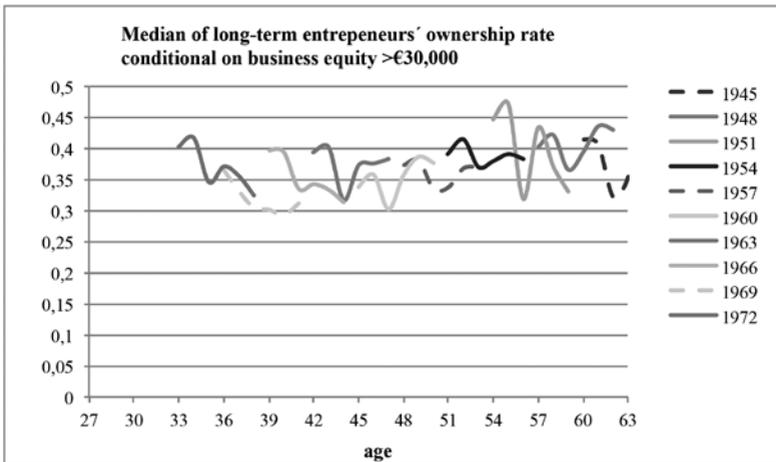
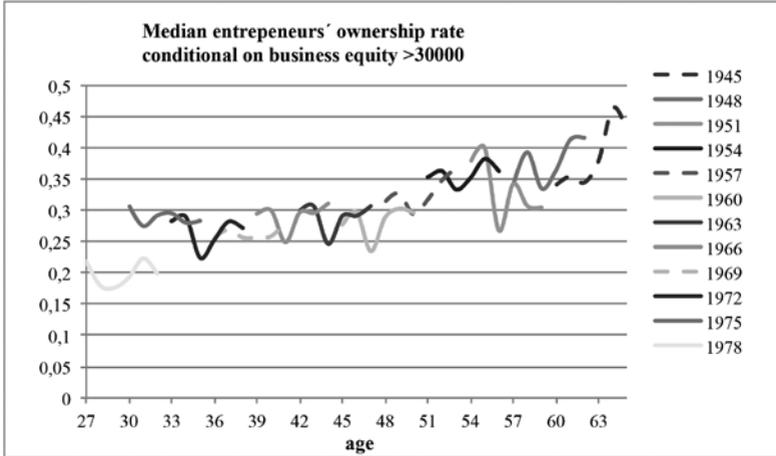


3.3 Business equity

Here we study business equity as reported in the IPO data. In Figure 3.4 we look at the ownership rate of business equity conditional on business equity exceeding € 30,000.

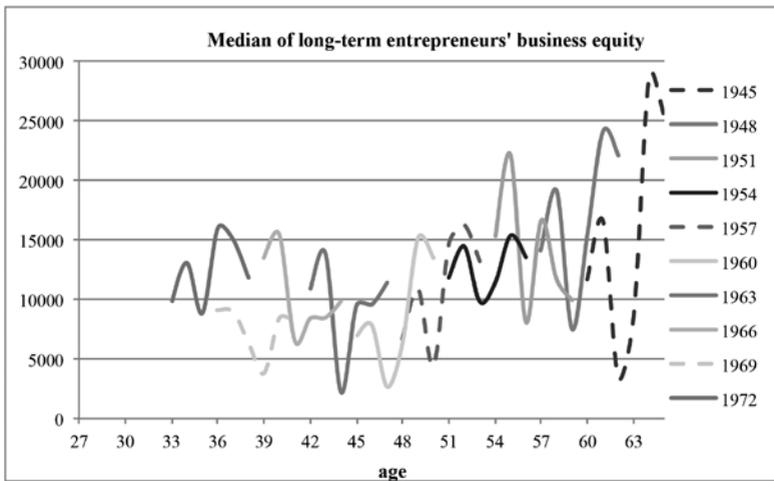
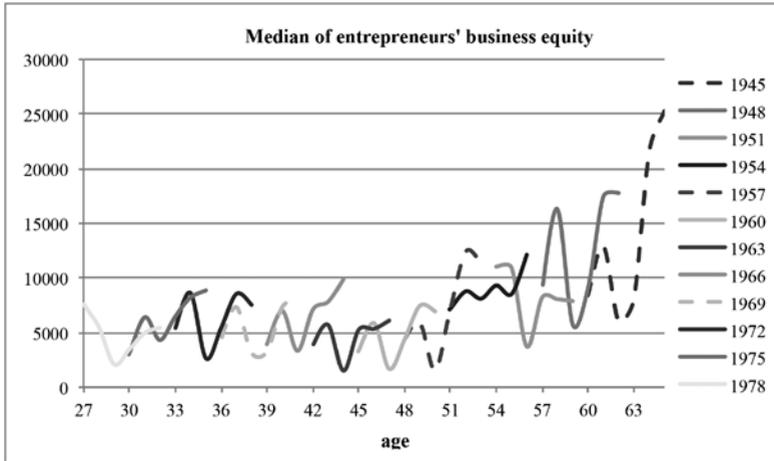
When we look at all entrepreneurs, we clearly see a positive age-time effect; this suggests that business equity of all cohorts increases over time. The figure shows, however, that more than half of the entrepreneurs have less than € 30,000 in business equity. However, the results are mixed: when we look at the long-term entrepreneurs, this positive age-time effect is less clear, and again cohort-time effects appear where older cohorts have higher wealth at a given age. So the lower panel of Figure 3.5 again casts doubts as to whether entrepreneurs who approach retirement will dispose of substantial business equity for annuity purposes.

Figure 3.4: Business equity ownership in the IPO data



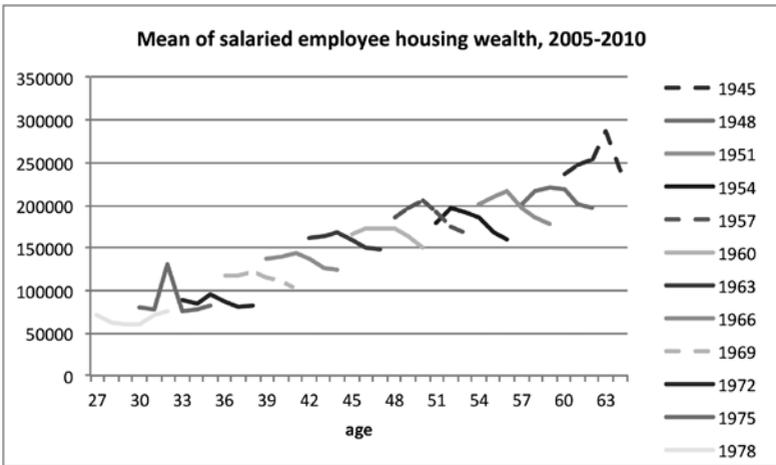
In Figure 3.5 we look at median business equity. This seems to have a positive gradient for the age-time effect, both for current and long-term entrepreneurs. Looking at the percentage of business equity to total wealth, this appears to be about 7-8%.

Figure 3.5: Business equity in the IPO data



This shows that, for most entrepreneurs, their business equity will not be high enough to generate significant annuity value.

Figure 3.6: Housing wealth in the IPO data



3.4 Housing wealth

Above we have extensively discussed the empirical evidence in terms of housing wealth using the DNB RMBS LLD data. The advantage of this was that it allowed us to isolate many different components of housing wealth, although we only used one cross-section.

Using the IPO data we cannot be as precise in the definition of housing wealth, but they allow us to use a longer panel to look at the development over time. First, we notice that the mean wealth is higher than in the LLD since the most recent evaluation year here is 2009 (reported in the 2010 tax return), thus prior to the drop in housing prices by about 20% between 2009 and 2013 (the year in which we observe the LLD). Here also, home equity is not increased by saving deposits, although we noted in Figure 2.4 that these are small. Similar to the findings in the LLD, here we also see that younger and older cohorts have similar home equity. The IPO data suggest, however, that a middle-aged entrepreneurs has higher home equity compared to a middle-aged salaried employee. Also in line with the above findings is the time pattern of the IPO results. The middle-aged sole entrepreneur appears to be more sensitive to age-time effects, in the sense that the shape of each segment in Figure 3.6 is more hump-shaped than for salaried employees. This means that the entrepreneur's home equity is more sensitive to price effects. This is possibly due to the fact noted in the LLD, namely that entrepreneurs tend to own more expensive houses, which are financed with higher debt.

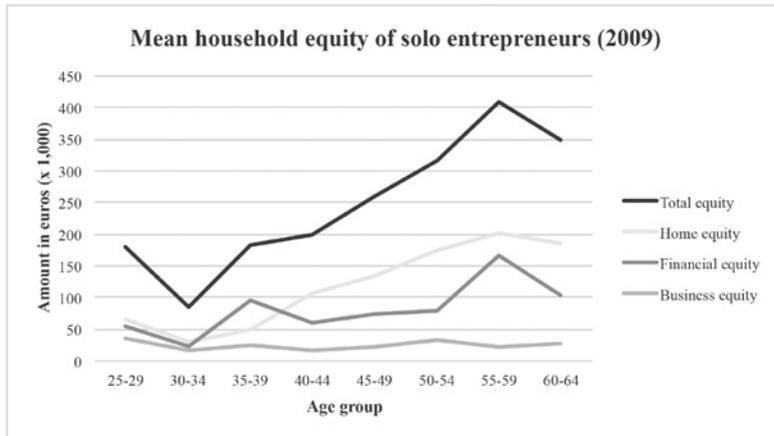
4. Private equity of solo entrepreneurs

So far we have described the wealth accumulation of entrepreneurs in general. This is a very heterogeneous group, as evidenced by the distribution of their wealth and the relation to observed characteristics. We have seen for instance how median financial wealth and home equity change, depending on whether we apply a broad or strict definition of self-employment, or depending on how old the solo entrepreneur is.

Projections into the future of the main wealth items suggest that, if housing prices do not increase by at least 1% per year (thus 35% cumulative over the 30 years that we project), current generations of entrepreneurs will not have as much housing equity as currently retired entrepreneurs. Admittedly, the current high level of entrepreneurs' housing wealth could be the result of selection effects. However, this only supports our finding because, if selection were to be present also in the future (for instance due to higher survival chances in self-employment of the richest), this would imply that many 'poorer' entrepreneurs will drop out, which is very unlikely to affect their housing wealth positively (for instance because one reason to drop out could be a company default).

Another way to see this is by looking at the projections of future financial wealth of entrepreneurs. The younger cohorts (say, those born around 1982), where survival issues play a less prominent role relative to older cohorts (say, those born around 1962), are not projected to achieve the accumulated financial wealth of currently retired entrepreneurs, not even in the more optimistic scenarios. The 1962 cohort is more likely to do that. It could be that those born in 1962 who are still entrepreneurs are actually survivors, while many others have already dropped out.

Figure 4.1: Private equity of the EIM panel population in the IPO data



These remarks suggest the overall conclusion that many younger entrepreneurs will not be able to accumulate as much private wealth as currently retired entrepreneurs.

What picture emerges when we look at business equity? The figures contained in the IPO data suggest that this should not change our conclusions. However, the medians presented in the paper mask a huge heterogeneity. This is due to the fact that we have not yet considered a main driver of heterogeneity in the data, namely whether one is a solo entrepreneur or an entrepreneur with a larger firm. The second group is more likely to have much higher business equity, while the first, working alone, is less likely to have generated much business capital.

The IPO data do not allow direct identification of the solo entrepreneurs. We have therefore linked the EIM panel participants to the CBS wealth data for the 2006–2009 period. Relative to the previous data, we have a small N and a small T, but we have identified the specific and particularly interesting subgroup of the solo entrepreneur. In Figure 4.1 we plot their total household

equity, including the three main equity components, for the year 2009.

The figure suggests the same pattern with age as that observed for the equity components from the other data sets. In principle, this also holds if we show the age-time cohort figures, but the pattern is more erratic due to the smaller sample size. This analysis suggests that looking at the specific subsample of solo entrepreneurs yields no additional information at the mean, possibly because they already represent the largest fraction of entrepreneurs in the IPO data. Also for solo entrepreneurs, home equity is their main component of wealth. Business equity is again about € 10,000 at all ages, and financial wealth only peaks for the elderly.

This suggests that our findings yield a reliable picture for the vast majority of entrepreneurs in the Netherlands. Of course we cannot exclude a heavy right-tail in the wealth distribution of entrepreneurs, but this does not seem to affect the results presented here.

Summary and conclusions

In this study we have used different data sources to analyze the wealth of entrepreneurs. We had two aims. The first was to fill the gap of knowledge when it comes to specific wealth items. This is the case for assets linked to mortgages. These are not present in any dataset, but we are able to proxy them thanks to newly acquired loan level data from the main Dutch banks, which cover about 80% of all mortgages in the Netherlands. The dataset is so large and detailed that many different components of housing wealth can be identified for many homeowner cohorts. Another item that has been studied little so far is voluntary redemptions. These are also identified in the new data, and their effect on outstanding debt described.

The second aim was to project the wealth of entrepreneurs into the future in order to depict their resources prior to retirement. These projections depend on the specific wealth items that we examine. In the case of housing wealth, the fact that we have such detailed data allows us to deterministically project the development of the mortgage to maturity. We use econometric models to estimate future voluntary redemptions under different macro scenarios of housing price developments.

In the case of financial wealth we use a more common age-cohort-period model, where time effects are captured by GDP growth. Also with this model we use different macro-economic scenarios to project this wealth item into the future.

The results show that taking into account the assets linked to the mortgages has little effect on home equity, although it does make the difference between being underwater or not in about 10% of the mortgages. Also, we show that the median business equity is low and is not likely to boost retirement income.

Projections of housing wealth to the future show that this will very much depend on future macro-economic conditions. If prices increase steadily, current generations should even be able to surpass the home equity of the current older generation. However, if prices fall, this will not be the case. In addition, as entrepreneurs appear to be more exposed to mortgage debt, adverse scenarios have larger negative effects for them.

Our projections of financial wealth suggest that, even under favorable macro-economic conditions, it will be more difficult for today's entrepreneurs to reach the level of financial wealth of their older counterparts.

Our simulation does not include possible behavioral reactions, and we have kept the policy environment stable. Depending on individual circumstances, a further deterioration of the economy could induce individuals to either hold more liquid wealth or favor lower mortgage repayments, or the other way around. Also job mobility and the need for moving (thus renegotiating the mortgage) could become more or less pressing. Preferences for leisure could also change. Without a proper microsimulation model these concerns cannot be addressed.

In short, our results highlight a high level of uncertainty about the future wealth holdings of entrepreneurs. However, it seems unlikely that future macro-economic scenarios will be so favorable that younger cohorts will reach higher levels of wealth than the currently older generation.

The empirical results in this study complement current studies on the preparation for retirement of entrepreneurs and the debate on the desirability of compulsory social insurance for entrepreneurs. We refer to Mastrogiacomo et al. (2014) for a review of this discussion.

References

- As, D. van, M. Boumans, F. van Dijk, M. van Loon (2013), Pensioenvoorzieningen zelfstandigen zonder personeel (zzp'ers) in de tweede pijler. Pensioenfederatie
- Bosch N., G. Roelofs, D. van Vuuren and M. Wilkens (2012), De huidige en toekomstige groei van het aandeel zzp'ers in de werkzame beroepsbevolking. CPB (2012)
- Cagetti, M. and M. De Nardi (2006), Entrepreneurship, Frictions, and Wealth. *Journal of Political Economy*, Vol. 114, pp. 835–870.
- Dunn, Thomas and Douglas Holtz-Eakin (2000), Financial Capital, Human Capital, and the Transition to Self-Employment: Evidence from Intergenerational Links. NBER Working Paper No. 5622
- Gentry, M. and R. Hubbard (2004). Entrepreneurship and Household Saving. *The B.E. Journal of Economic Analysis & Policy* 4 (1), pp. 1–57.
- Hamilton, B.H. (2000), Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment, *Journal of Political Economy*, Vol. 108, No. 3 (June 2000), pp. 604–631
- Hurst, Erik and Annamaria Lusardi (2004). Liquidity Constraints, Household Wealth, and Entrepreneurship. *Journal of Political Economy* 112 (2)
- Hurst, Erik, Annamaria Lusardi, Arthur Kennickell and Francisco Torralba (2010), The importance of business owners in assessing the size of precautionary savings. *Review of Economics and Statistics*
- Lecq, F. van der and A. Oerlemans (2009). Zelfstandigen Zonder Pensioen. NEA-paper 24. Netspar
- Mastrogiacomo, M., R. Dillingh and K. Bangma K. (2014), Een pensioenregeling voor zelfstandigen: de voor- en nadelen van een opt-in. NEA
- Statistics Netherlands, CBS (2011). Report. *Statistics Annual Report*.

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Entrepreneurs without wealth?

(Solo) entrepreneurs are mostly excluded from second pillar pensions in the Netherlands. To generate substantial additional income after retirement, they largely depend on voluntary participation in third pillar pension products or on other private arrangements. In this paper Mauro Mastrogiacomo (DNB), Yue Li (VU A) and Rik Dillingh (TIU) explore three main components of the disposable wealth of (solo) entrepreneurs: financial wealth, business equity and home equity. They use different datasets, some of them novel to academic research, and extrapolate the different levels of pre-retirement wealth of currently young entrepreneurs. They show that there is a large heterogeneity in wealth holdings across generations, that business equity is generally low, and that only some entrepreneurs, under favorable macroeconomic conditions, will achieve the same level of wealth as currently older entrepreneurs.