Housing Bubbles, Wealth Inequality and Capital Income Taxation*

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Abstract

This paper combines different sources (tax records, national accounts, wealth surveys) to construct wealth distribution series for Spain since the mid-eighties until the present. The wealth inequality series and a new asset-specific wealth accumulation decomposition are then used to analyze how housing booms and busts shape the wealth distribution using two historical episodes (1984-1998 and 1999-2015). Wealth concentration drops during housing booms and rises during busts. My findings suggest that differences in rates of return and capital gains are the main drivers of wealth inequality dynamics during housing booms and saving rates during busts. Rich individuals, which are not as liquidity constrained as individuals in the middle and bottom of the distribution, are able to better diversify their portfolio during the housing bust substituting their saving on housing for saving on financial assets, contributing to revert the decreasing trend in wealth concentration of the housing boom. The importance of saving rates on financial assets was exacerbated during the recent housing bust due to a large capital income tax reform that created a wedge between the taxation of financial income (interest and dividends) and housing rents. These results provide the type of evidence needed to discipline macroeconomic theories of wealth inequality, asset price changes and capital income taxes.

Keywords: Wealth Inequality, Housing, Portfolio Composition, Capital Income Taxes, Spain

JEL Classification: D3, N3, R2

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I Introduction

Both the evolution of aggregate personal wealth and top wealth concentration is well-documented for many developed economies (Piketty and Zucman (2014), Waldenström (2017), Artola Blanco et al. (2019), Saez and Zucman (2016), Garbinti et al. (2017), Alvaredo et al. (2017), Lundberg and Waldenström (2017)). Wealth to national income ratios have followed relatively similar increasing trends in the last thirty years, but top wealth concentration has raised much more in the US than in Europe. However, there still exists a gap in understanding the complex interaction between the aggregate evolution of wealth and its distribution. These interactions are of particular importance during booms and busts since individuals’ wealth levels and portfolio composition along the distribution might significantly change and trends in medium to long-term wealth inequality could revert. Wealth inequality dynamics are even more relevant during housing booms and busts given that housing is the main asset and housing mortgages the main liability in most individual portfolios (Saez and Zucman (2016), Garbinti et al. (2017), etc.), home-ownership ratios are quite high (40-90% across OECD countries in 2011, Andrews and Sánchez (2011)) and the recent rise in wealth to national income ratios has been mainly driven by capital gains on housing (Piketty and Zucman (2014), Artola Blanco et al. (2019)).

This paper aims to fill this gap by studying how housing booms and busts shape the wealth distribution using the Spanish context. The analysis is carried by combining different sources (tax records, national accounts, wealth surveys) to construct wealth distribution series and a new asset-specific wealth accumulation decomposition to disentangle the key forces driving the wealth inequality dynamics during the boom and the bust. Spain is well-suited to analyze this question, since it experienced a large housing boom and bust during the 2000s, reaching an unprecedented personal wealth to national income ratio level of more than 700% in 2007 (Artola Blanco et al. (2019)). No other analyzed country has reached such a level at any point in history.

There exist five main methods and/or sources to analyze wealth inequality. The first is the estate multiplier method, that provides a snapshot of the wealth distribution at the
time of death using estate tax records data. The main difficulty is how to generalize from
decedents to the full population. The second possible approach is to use surveys of house-
hold finances. Contrary to the estate multiplier method, one advantage of using survey
data is that it allows to characterize the middle and bottom of the wealth distribution.
Nevertheless, even though most of these surveys oversample wealthy households, concen-
tration at the top tends to be underestimated because of misreporting or top coding. The
third available source are wealth tax returns. Wealth tax data cover very well the top of
the distribution, but three main limitations remain. First, there are very few countries in
the world which have a wealth tax (i.e. Spain, France, Norway, Uruguay, etc.). Second,
only very wealthy individuals are subject to the tax, making it impossible to analyze
the middle and bottom of the distribution. Third, many assets are exempted from this
tax, so that it is not possible to have a whole picture of the wealth distribution. The
fourth is the capitalization method, which consists of applying a capitalization factor to
the capital income distribution to arrive to the wealth distribution. The main advantages
of the capitalization technique are that it is based on income data, which are much easier
to obtain than wealth data, and that the top is very well covered. The main limitation is,
as in the case of the wealth tax, that there are also some assets whose generated income
is not subject to the tax. Finally, one can also analyze the upper part of the distribution
using lists of high-wealth individuals, such as the annual Forbes 400 list. The drawback
in this case is that named lists are limited to a very small group of top wealth-holders
and have non-systematic coverage.

Despite the immense literature on the analysis of wealth distributions, two important
gaps remain. First, there is still no consensus on the method of analysis that should be
adopted, since there are conflicting results depending on which of the techniques or sources
are used. For instance, Saez and Zucman (2016) find that wealth considerably increased at
the top 0.1% in the US over the last two decades using the income capitalization method,
contrary to the results obtained by Kopczuk and Saez (2004) using the estate multiplier
method.

Second, due to data limitations, empirical evidence on the determinants of wealth
concentration is still scarce. There is some evidence that the surge in top incomes and offshore wealth (Saez and Zucman (2016), ?), and the increase in saving and rates of return inequality (Garbinti et al. (2017), Saez and Zucman (2016)) have pushed toward wealth concentration in the last two decades. However, it is still unclear which are the distributional effects of specific economic phenomena, such as housing bubbles.

The starting point of the mixed capitalization-survey approach used in this work involves the application of a capitalization factor to the distribution of capital income to arrive to an estimate of the wealth distribution. Capitalization factors are computed for each asset in such a way as to map the total flow of taxable income to total wealth recorded in Financial and Non-financial accounts. When combining taxable incomes and aggregate capitalization factors, it is assumed that within each asset class capitalization factors are the same for each individual. By using this methodology, I am able to obtain wealth distribution series consistent with official financial and non-financial household accounts. In Spain, as in most of countries, not all assets generate taxable income. We account for them by allocating them on the basis of how they are distributed, in such a way as to match the distribution of these assets in the Survey of Household Finances developed by the Bank of Spain. The assets which we account for are main owner-occupied housing, life insurance, investment and pension funds.

The wealth distribution in Spain has been analyzed in the past using three different data sources. Firstly, Alvaredo and Saez (2009) use wealth tax returns to construct long run series of wealth concentration for the period 1982 to 2007. The progressive wealth tax has high exemption levels and only the top 2% or 3% wealthiest individuals file wealth tax returns. Thus, they limit their analysis of wealth concentration to the top 1% and above. They find that top wealth concentration decreases at the top 1% from 19% in 1982 to 16% in 1992 and then increases to almost 20% in 2007. However, in contrast to the top 1%, they obtain that the 0.1% falls substantially from over 7% in 1982 to 5.6% in 2007. Durán-Cabré and Esteller-Moré (2010) also use wealth tax returns to analyze the distribution of wealth at the top and obtain similar results. Their approach complements theirs by offering a more precise treatment of the correction of fiscal underassessment and
tax fraud in real estate, which is the main asset in Spaniards’ portfolios.

Secondly, Azpitarte (2010) and Bover (2010) use the 2002 Survey of Household Finances developed by the Bank of Spain in order to analyze the distribution of wealth at the top. This analysis can be carried out because the survey is constructed doing an oversampling of wealthy households. Azpitarte (2010) presents results for the top 10-5%, 5-1% and 1%. Bover (2010) provides shares for the top 50%, top 10%, top 5% and top 1%. Their estimates for the top 1% are very similar, 13.6% and 13.2%, respectively. However, they are much lower than the results of Alvaredo and Saez (2009) using wealth tax returns, who obtain that the top 1% holds 20% of total wealth. The OECD has also published recently a report in which they analyze wealth inequality across countries (OECD (2015)) using household survey data. They find that the top 1% holds 15.2% in 2011 and that wealth inequality in Spain is lower relative to the average of other 16 OECD countries.

Finally, Alvaredo and Artola (2017) use inheritance tax statistics to estimate the concentration of personal wealth at death in Spain between 1901 and 1958. They compare their results with the estimates among the living of Alvaredo and Saez (2009) for the period between 1982 and 2007. They find that concentration of wealth at the top 1% of the distribution was approximately three times larger during the first half of the 20th century than at the end of the same century. Unfortunately, there are no inheritance data available for the current decades. Hence, it is quite relevant to use the capitalization method instead.

Wealth concentration dropped in Spain since the eighties until the end of the housing boom of the 2000s and it increased afterwards during the years of the housing bust. My findings suggest that differences in rates of return and capital gains are the main drivers of wealth inequality dynamics during housing booms and saving rates during busts. Rich individuals diversify their portfolio during the housing bust substituting housing for financial assets contributing to revert the decreasing trend in wealth concentration of the housing boom. The trends and levels in the wealth shares are very similar to the ones obtained by Alvaredo and Saez (2009) using wealth tax returns.

Using a difference-in-differences design, in the last part of the paper I show that a
large capital income tax reform in 2006 which created a wedge between the taxation of financial income (interest and dividends) and housing rents led to an increase in financial income specially at the top. This reform helps to explain why during the recent housing bust the increase in wealth concentration was more pronounced than during the housing bust of the nineties.

The layout of the paper is as follows. Section II discusses the concepts, data and methodology used to construct the wealth distribution series. In Section III I present the aggregate trends in wealth and its distribution over the period 1984-2015. A new asset-specific decomposition of wealth accumulation and some simulation exercises are presented in Section IV in order to better understand the key drivers of the dynamics of wealth inequality during housing booms and busts. In Section V I reconcile and test the methodology used with other sources. In Section VI I analyze the implications of capital income taxes focusing on a large capital income tax reform which was introduced at the beginning of the recent housing bust. Finally, Section VII concludes. All figures and tables to which the text refers to are included in the appendix at the end of the paper. The data appendix is an excel file ("Wealth Inequality Spain Database") which includes the complete set of results.

II Concepts, Data and Methodology

This section describes the concepts, data and methodology used to construct the Spanish wealth distribution series over the period 1984-2015. Further methodological details of the Spanish specific data sources and computations can be found in the appendix at the end of the paper and all detailed calculations in the companion data appendix.

II.I Aggregate Wealth: Concept and Data Sources

The wealth concept used is based upon national income categories and it is restricted to net household wealth, that is, the current market value of all financial and non-financial assets owned by the household sector net of all debts. For net financial wealth, that is, for
both financial assets and liabilities, the latest and previous financial accounts (European System of Accounts (ESA) 2010 and 1995, Bank of Spain) are used for the period 1996-2015 and 1984-1995, respectively. Financial accounts report wealth quarterly and I use mid-year values.

Households’ financial assets include equities (stocks, investment funds and financial derivatives), debt assets, cash, deposits, life insurance and pensions. Households’ financial liabilities are composed of loans and other debts. It is important to mention that pension wealth excludes Social Security pensions, since they are promises of future government transfers. As it is stated in Saez and Zucman (2016), including them in wealth would thus call for including the present value of future health care benefits, future government education spending for one’s children, etc., net of future taxes. Hence, it would not be clear where to stop.

The wealth concept used only considers the household sector (code S14, according to the System of National Accounts (SNA)) and excludes non-profit institutions serving households (NPISH, code S15). There are three reasons which explain this decision. First, due to lack of data, non-profit wealth is not easy attributable to individuals. Second, income from NPISH is not reported in personal income tax returns. Third, non-profit financial wealth amounts to approximately 1-3% of household financial wealth between 1995 and 2017 in Spain (Table A1). Hence, it is a negligible part of wealth and excluding it should not alter the results.

Spanish financial accounts report financial wealth for the household and NPISH sector and also for both households and NPISH isolated as separate sectors. However, the level of disaggregation of the balance sheets in the latter case is lower than in the case in which households and NPISH are considered as one single sector. For instance, whereas the balance sheet of the sector of households and NPISH distinguishes among wealth held in investment funds and wealth held in stocks, the balance sheet of the household sector only provides an aggregate value with the sum of wealth held in these two assets. In order to have one value for household wealth held in investment funds and one value for household wealth held in stocks, I assume that they are proportional to the values of households’
For non-financial wealth, it is not possible to rely on non-financial accounts based on the SNA. Even though there are some countries that have these accounts, such as France and United Kingdom, no institution has constructed these type of statistics for Spain yet. I need to use other statistics instead. My definition of household non-financial wealth consists of housing and unincorporated business assets and I rely on the series elaborated by Artola Blanco et al. (2019). Housing wealth is derived based on residential units and average surface from census data on the one hand, and average market prices from property appraisals, on the other hand. Unincorporated business assets have been constructed using the five waves of the Survey of Household Finances (2002, 2005, 2008, 2011, 2014) elaborated by the Bank of Spain and extrapolated backwards using the series of non-financial assets held by non-financial corporations also constructed by the Bank of Spain.

I exclude collectibles since they amount to less than 1% of total household wealth and they are not subject to the personal income tax. Furthermore, consumer durables, which amount to approximately 10% of total household wealth, are also excluded, because they are not included in the definition of wealth by the SNA and there are no statistics about consumer durables owned by Spanish households for the period prior to 2002.

II.II Distribution of Wealth: The Mixed Capitalization-Survey Approach

The wealth distribution series are constructed by allocating the total household wealth as defined in the previos subsection to the various groups of the distribution. For that, I proceed with the following three steps. First, the distribution of taxable capital income

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1 Net housing wealth is the result of deducting real estate debt from household real estate wealth. Note that real estate debt is approximated by total household liabilities. This a quite reasonable approximation since as Table A2 in appendix shows, real estate property debt accounts for 80-88% of total household debt over the period 2002-2014 according to the Survey of Household Finances.

2 A detailed explanation of the sources and methodology used in order to construct these two series can be found in the appendix of Artola Blanco et al. (2019).

3 The shares of both collectibles and consumer durables over total household wealth are obtained using the Survey of Household Finances developed by the Bank of Spain. See Table A3 in appendix.
is calculated. Second, the taxable capital income is capitalized. Third, I account for wealth that does not generate taxable income. This is a mixed method and not the pure capitalization technique, because the survey method is used in order to account for both income at the bottom of the distribution and assets that do not generate taxable income.

II.II.I The Distribution of Taxable Capital Income

The starting point is the taxable capital income reported on personal income tax returns. I use micro-files of personal income tax returns constructed by the Spanish Institute of Fiscal Studies (Instituto de Estudios Fiscales (IEF)) in collaboration with the State Agency of Fiscal Administration (Agencia Estatal de Administración Tributaria (AEAT)). They have three different types of files: two personal income tax panels that range from 1982-1998 and 1999-2014, respectively, and personal income tax samples for 2002-2015. I use the first income tax panel for 1984-1998\(^4\), the second panel for 1999-2001 and all income tax samples for 2002-2015. The micro-files provide information for a large sample of taxpayers\(^5\), with detailed income categories and an oversampling of the top. The income categories I use are interest, dividends, effective and imputed housing rents, as well as the profits of sole proprietorships.\(^6\) The micro-files are drawn from 15 of the 17 autonomous communities of Spain, in addition to the two autonomous cities, Ceuta and Melilla. Two autonomous regions, Basque Country and Navarre, are excluded, as they do not belong to the Common Fiscal Regime (Régimen Fiscal Común), because they manage their income taxes directly. Combined these two regions represent about 6-7% and 8% of Spain in terms of population and gross domestic product, respectively (Tables A4 and A5).

The unit of analysis used is the adult individual (aged 20 or above), rather than the tax unit. Splitting the data into individual units has on the one hand the advantage

\(^4\)Even though the first panel is available since 1982, I decided to start using it from 1984 since I found some inconsistencies between the files for 1982 and 1983 and subsequent years.

\(^5\)Personal income tax samples are more exhaustive (i.e. 2,700,593 tax units in 2015) than the panels (i.e. 390,613 tax units in 1999).

\(^6\)Note that imputed housing rents exclude primary residence from the period 1999-2015. I explain the way in which I account for Primary residence in the following subsection. Moreover, profits of sole proprietorships are considered as a mixed income, so that I assume as it is commonly done in the literature that 70% of profits are labor income and 30% capital income.
of increasing comparability as across units since individuals in a couple with income for example at the 90th percentile is not as well off as an individual with the same level of income. On the other hand, it is also more advantageous for making international comparisons, given that in some countries individual filing is possible (i.e. Spain, Italy) and in others (i.e. France, US) not. Since in personal income tax returns the reporting unit is the tax unit, I need to transform it into an individual unit. A tax unit in Spain is defined as a married couple (with or without dependent children aged less than 18 or aged more than 18 if they are disabled) living together, or a single adult (with or without dependent children aged less than 18 or aged more than 18 if they are disabled). Hence, only the units for which the tax return has been jointly made by a married couple need to be transformed. For each of these units I split the joint tax returns into two separate individual returns and assign half of the jointly reported capital income to each member of the couple. In 2015, for instance, this operation converts 19,480,423 tax units into 22,945,329 individual units in the population aged 20 or above, that is, approximately 18% of units are converted.

One limitation of using personal income tax returns to construct income shares in the Spanish case is that not all individuals are obliged to file. There exist some labour income and capital income thresholds under which individuals are exempted from filing. In 2015, for instance, the labour income threshold when receiving labour income from one single source was 22,000 euros and 12,000 euros when receiving it from two or more sources. The capital income threshold was 1,600 euros for interest, dividends and/or capital gains and 1,000 euros for imputed rental income and/or Treasury bills. For instance, over the period 1999-2015, approximately one third of the adult population was exempted from filing (Table A6). I account for the missing adults using the Spanish Population

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7Since business income from self-employment is a mixed income, only the part corresponding to capital income is split among the couple.
8Given the incentives of the tax code to file separately whenever both individuals in the couple receive income – the reductions for filing jointly usually do not compensate for the increase in the tax base – there are more married couples filing individually the further we move up in the income distribution. The 2015 Spanish Personal Income Tax Guide (Guía de la Declaración de la Renta 2015) includes a more detailed explanation in Spanish about how personal income tax filing works in Spain.
Census for the period 1984-2015 to compare the population totals by age and gender of the micro-files with the population totals of the Census excluding the regions of Basque Country and Navarre. I then create new observations for all the missing individuals. By construction, my series perfectly match the Population Census series by gender and age. These new individuals, although being the poorest since they do not have to file the personal income tax, earn some labour and also some capital income in the form of interest from checking accounts or deposits. Hence, we need to account for this missing income, otherwise we would be overestimating the amount of wealth held by the middle and the top of the distribution. For that, I rely on the Survey of Household Finances for the period 1999-2015 and on the Household Budget Continuous Survey for the period 1984-1998. Appendix A explains in detail the imputation method followed using the two surveys. In Section II.IV, different tests are run to prove the accuracy and robustness of the imputation method.

Finally, before capitalizing the capital income shares, it is important to check that income is distributed in a coherent way and that there are no significant breaks across years due to, for instance, tax reforms or the use of different data sources. If already the income data are not coherently distributed, neither the wealth distribution estimates will be. In appendix A, I explain in detail the particular aspects of the reforms which could potentially affect my methodology and how I deal with them in order to ensure consistency in the series across the whole period of analysis.

II.II.II The Income Capitalization Method

In the second step of the analysis the investment income approach is used. In essence, this method involves the application of a capitalization factor to the distribution of taxable capital income to arrive to an estimate of the wealth distribution.

The income capitalization method used in this paper may be set out formally as follows. An individual $i$ with wealth $w$ invests an amount $a_{ij}$ in assets of type $j$, where $j$ are

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10The oldest personal income tax panel that I use for the period 1984-1998 does not include information about age nor gender. Hence, for this period of time I simply adjust the the micro-files to match the Population Census totals excluding Basque Country and Navarre but without taking age and gender into consideration.
is an index of the asset classification \((j = 1, \ldots, J)\). If the return obtained by the individual on asset type \(j\) is \(r_j\), his investment income by asset type is:

\[
y_{ij} = r_j * a_{ij}
\]  

(1)

and his total investment income:

\[
y_i = \sum_{j=1}^{J} r_j * a_{ij}
\]

(2)

Rearranging equation (1), the wealth for each individual by asset type is, thus, the following:

\[
a_{ij} = \frac{y_{ij}}{r_j}
\]

(3)

By rearranging equation (2), the total wealth for each individual is:

\[
w_i = \sum_{j=1}^{J} y_{ij} * r_j
\]

(4)

In the following paragraphs, this formal setting is applied to the Spanish case in order to obtain the wealth distribution series.

There are five categories of capital income in personal income tax data: effective and imputed (excluding Primary residence) rental income, business income from self-employment, interest and dividends. Tax return income for each category is weighted in order to match aggregate national income from National Accounts. I then map each income category (e.g. business income from self-employment) to a wealth category in the Financial Accounts from the Bank of Spain (e.g. business assets from self-employment).\(^{12}\)

As it was mentioned in Section III, income tax data exclude the regions of Basque Country and Navarre. Therefore, before mapping the taxable income to each wealth

\(^{11}\)Note that the capitalization method relies on the assumption that the rate of return is constant for each asset type, that is, it does not vary at the individual level.

\(^{12}\)Capital gains are excluded from the analysis. The reason is that they are not an annual flow of income and consequently, they experience large aggregate variations from year to year depending on stock price variations. By including them, the trends in the wealth distribution series could be biased since we observe large variations in capital gains from year to year.
category, income and wealth in national accounts need to be adjusted excluding the amounts corresponding to these two regions. Ideally, if one would know the amount of wealth and income in each category by region, one could simply discount the wealth and income corresponding to these two regions. Unfortunately, neither the Bank of Spain nor the National Statistics Institute have constructed regional national accounts with disaggregated information by asset type yet, so another methodology needs to be used. I assume that income and wealth in each category are proportional to total gross domestic product and housing wealth excluding these two regions, respectively.\footnote{As it has already been mentioned, total gross domestic product in Basque Country and Navarre accounts for approximately 8\% of total gross domestic product over the period 1984-2016 (Table A5). This assumption seems reasonable since the share of housing wealth in Basque Country and Navarre also amounts to approximately 8\% of total housing wealth (Table A7).}

Once income and wealth have been adjusted accordingly, a capitalization factor is computed for each category as the ratio of aggregate wealth to tax return income, every year since 1984. This procedure ensures consistency with the Bank of Spain aggregate wealth data by construction. In 2015, for instance, business income accounts for about 20.6 billion euros and business assets from self-employees for 575.6 billion euros. Hence, the rate of return on business assets is 3.6\% and the capitalization factor is equal to 27.9. As it is shown in Table 1, flow returns (and thus capitalization factors) vary across asset types, being for most of the period higher for financial assets than for business assets and housing.\footnote{The rate of return on housing using National Accounts is very low for international standards, particularly during the most recent period (2002-2015). This can be explained by the fact that the differences in growth between housing wealth and housing rental income were much larger in Spain than in the rest of advanced economies. One potential explanation are the large differences in demand for renting (low) versus buying (high) dwellings in Spain, which have led to a larger increase in housing versus rental prices. In fact, the home-ownership ratio for primary residences is approximately 80\% according to the 2011 Census of dwellings (INE) and the calculations of the Bank of Spain (Table A8). Nonetheless, one cannot fully disregard the existence of some type of measurement error in the construction of the rental income and/or housing wealth series. In any case, under the assumption of equal returns by asset type along the distribution, this potential measurement error should not alter the wealth distribution series.} This is consistent with the findings of Jordà et al. (2019), who show that the rate of return on equities has outperformed on average the rate of return on housing since the eighties, but not in previous decades.

The capitalization method is well suited to estimating the Spanish wealth distribution because the Spanish income tax code is designed so that a large part of capital income flows are taxable. However, as it has been already mentioned, tax returns do not include

\[13\]
all income categories. In the following subsection, I carefully account for the assets that do not generate taxable income.

II.III Accounting for Wealth that Does not Generate Taxable Income

The third and last step consists of dealing with the assets that do not generate taxable income. In Spain, there are four assets whose generated income is not subject to the personal income tax: Main owner-occupied housing\textsuperscript{15}, life insurance, investment and pension funds. Although these assets account for a large part of total household wealth, namely around 40-50\% of total net household wealth (Table A9), the fact that they do not generate taxable income does not constitute a non-solvable problem for one main reason: Spain has a high quality Survey of Household Finances (SHF).

As it was mentioned in the beginning of this section, this survey provides a representative picture of the structure of household incomes, assets and debts at the household level and does an oversampling at the top. This is achieved on the basis of the wealth tax through a blind system of collaboration between the National Statistics Institute and the State Agency of Fiscal Administration which preserves stringent tax confidentiality. The distribution of wealth is heavily skewed and some types of assets are held by only a small fraction of the population. Therefore, unless one is prepared to collect very large samples, oversampling is important to achieve representativeness of the population and of aggregate wealth and also, to enable the study of financial behavior at the top of the wealth distribution. Hence, this survey is extremely suitable for this analysis and it allows to allocate all the previous assets on the basis of how they are distributed, in such a way as to match the distribution of wealth for each of these assets in the survey. Appendix A explains in detail the imputation method used relying on the survey, which is very similar to the one developed by Garbinti et al. (2018) for France.

In order to make sure that the imputations are correctly done, I have carried different robustness checks using the Survey of Household Finances (read section II.IV). The levels and composition of my series are almost identical to the ones obtained directly from the

\textsuperscript{15}Main owner-occupied housing is exempted since 1999. Hence, we only need to impute Primary residence for the period 1999-2015.
II.III Accounting for Offshore Wealth

Tax records, such as the ones used in this paper, are the best available data source to study the top-end of the distribution. Contrary to surveys, they do not suffer from sampling errors and rely on solid information sources such as employee payroll data and bank records. However, this data source is not perfectly accurate due mainly to tax evasion. Our estimated series would not be biased if evasion does not vary over time nor along the distribution. Nonetheless, evasion might vary over time due to changes in tax enforcement strategies, and along the distribution because different groups might have different income sources and/or assets, which are more easy to evade.

Alstadsæter et al. (2019) find using micro-data leaked from offshore financial institutions and population-wide wealth records in Norway, Sweden, and Denmark, that the probability to disclose evading taxes rises steeply with wealth. Torregrosa (2015) also finds that evasion in the personal income tax is increasing as we move towards the top of the income distribution in Spain. Hence, by not incorporating offshore wealth in our wealth distribution series, both total assets and wealth concentration would be substantially underestimated.16

In Spain, as in most countries, official financial data fail to capture a large part of the wealth held by households abroad, such as portfolios of equities, bonds, and mutual fund shares held by Spanish persons through offshore financial institutions in tax havens17. Zucman (2013) estimates that around 8% of households’ financial wealth is held through tax havens, three-quarters of which goes unrecorded. Moreover, he also provides evidence that the share of offshore wealth has increased considerably since the 1970s. This fraction

16Self-employees might also evade taxes and indeed Torregrosa (2015) finds widespread tax evasion among them in the Spanish context. However, Alstadsæter et al. (2019) report that self-employment income accounts for less than 10% of factor-cost GDP in Spain and they argue that the self-employed are scattered throughout the wealth distribution. Hence, non-compliance by these individuals does not appear to be enough to generate sizable evasion rates in any specific segment of the wealth distribution which could bias the wealth distribution estimates. For these reasons and the lack of accurate estimates of self-employment income evasion rates along the income or the wealth distribution, I will only correct my series for unreported offshore assets.

17The Bank of Spain clearly explains in its Nota Metodológica de las Cuentas Financieras de la Economía Española (2011) what it is included and what it is not in the Spanish Financial Accounts.
is even larger for Spain. According to Zucman (2015), wealth held by Spanish residents in tax havens amounted to approximately 80 billion euros in 2012, which accounts for more than 9% of household’s net financial wealth.

In order to adjust the wealth distribution series for offshore assets I use the historical series of offshore wealth of Artola Blanco et al. (2019). They rely on two main data sources: Zucman (2013, 2014), whose series mainly come from the Swiss National Bank (SNB) statistics, and the unique information provided by the 720 tax-form. Since 2012, Spanish residents holding more than 50,000 euros abroad are obliged to file this form specifying the type of asset (real estate, stocks, investment funds, deposits, etc.), value, and country of location. This new form aims to reduce evasion by imposing large fines in case taxpayers are caught not reporting or misreporting their wealth. In an attempt to increase future revenue and reduce further evasion, the Tax Agency also introduced a tax amnesty in 2012.

Artola Blanco et al. (2019) calculate separately reported assets, that is, claims held abroad by Spanish residents and declared to the Spanish tax authorities, from unreported offshore wealth. Given that the Spanish Tax Agency cross-checks across all taxes reported income and wealth by taxpayers, income generated by reported assets in the wealth tax and 720 tax-form should be included in personal income taxes. Hence, I will only correct the wealth distribution series for unreported offshore assets. Artola Blanco et al. (2019) derive the series of unreported financial offshore wealth by first comparing total wealth held in Switzerland by Spanish residents with assets declared in this country in the 720 tax-form. In 2012, the comparison shows that 23% of offshore wealth was reported to tax authorities. This figure is consistent with Zucman (2013) estimate that around three quarters of offshore wealth held abroad goes unrecorded. According to the 720 tax-form, Switzerland concentrated in 2012 24% of total offshore wealth held by Spanish residents in tax havens. They extrapolate this series by applying the fraction of unreported assets observed in Switzerland to the rest of tax havens that appear in the 720-tax form.\(^\text{18}\)

The series ranges between 1999 and 2014, since the statistics on total offshore held
\(^{18}\)Note that the series of unreported offshore assets excludes real assets since most of them are declared to be in non-tax havens.
in Switzerland are only available for this period of time. They extrapolate the series backwards using the total amount of offshore wealth that flourished in the 1991 Spanish tax amnesty (10,367 million euros) and the proportion of European financial wealth held in offshore havens estimated by Zucman (2014) for the years prior to 1991.\footnote{For a more detailed explanation of how the series of unreported and reported offshore assets are constructed, read the appendix of Artola Blanco et al. (2019).}

The importance of offshore assets relative to total household financial assets increased rapidly during the nineties and beginning of the 2000s and declined significantly after 2003, a period in which Spanish tax authorities have become stricter with tax evasion by carrying more audits, introducing the 720 tax-form and implementing a tax amnesty in 2012 (Figure A1, panel (a)). Unreported offshore wealth amounted to 158,915 million euros in 2012, which represents 9% of household financial wealth.\footnote{This figure is larger than the estimate of 80,000 million euros in Zucman (2015). Note that Zucman’s estimate is an extrapolation using Swiss National Banks statistics, but that Artola Blanco et al. (2019) use administrative data on reported wealth held by Spanish residents abroad.} Investment funds represent 50% of total unreported offshore assets, followed by stocks with 30%, and deposits and life insurance with 18% and 2%, respectively (Figure A1, panel (b)).

I correct the wealth distribution series by assigning proportionally to the top 1% wealth group the annual estimate of unreported offshore wealth. In doing this, we follow Alstadsæter et al. (2019) who find that the top 1% wealth group in Scandinavian countries accumulates almost all the disclosed assets of tax amnesties. According to the authors, there is nothing unique to Scandinavia that could explain the high evasion rates we find at the top. Moreover, this is consistent with an official document of the Spanish Tax Agency (\textit{Efecto del 720 y el 750 en el Impuesto sobre el Patrimonio, Nota de presa (2016)}) stating that the majority of reported foreign assets by Spanish residents are held by top wealthholders.

III.I Aggregate Household Wealth Stylized Facts

In this section I briefly describe the most important stylized facts in the evolution of aggregate household wealth in Spain over the period 1984-2015. Understanding how wealth has changed in aggregate terms is crucial to later interpret the wealth inequality dynamics in the following subsection.


The first stylized fact points out that the household wealth to national income ratio has almost doubled during that period of time. Household wealth amounted to 359% in 1984 and it grew up during the first housing boom up to 435% in the early nineties. During the housing bust of the mid-nineties it stabilized and from 1998 onwards, it started to increase more rapidly reaching the peak of 727% of national income in 2007, the end of the second housing boom. After the burst of the crisis in 2008, it dropped and it has been decreasing since then. In 2015, the household wealth to national income ratio amounted to 629%, a level which is similar to the wealth to national income ratio of 2004, but much higher than the household wealth to national income ratios of the eighties and nineties (Figure 1). The level of household wealth to national income that Spain reached in 2007 is the highest among all countries with available records in the early twenty-first century (Artola Blanco et al. (2019)).

The second stylized fact determines the existence of temporal differences not only in the growth of total net wealth – as it was pointed out in the first stylized fact – but also in the growth of its components. During the housing boom of the late eighties the growth in net housing was more than double the growth in financial assets. During the nineties this trend reversed and financial assets started to rise faster due mainly to the dot-com
bubble and the housing bust. Since the stock market crash of 2000, the housing boom gained importance and housing prices increased rapidly surpassing financial assets. The value of dwellings reached the peak in 2008, after which the housing boom collapsed and the drop in housing wealth was larger than in financial assets (Figures 1 and 2).

The third and last stylized fact refers to the increase in the importance of net housing in the asset portfolio of households. Figure 2 shows that even though dwellings are during the whole period the most important asset held by households, always representing more than 40% of total household net wealth, the composition of household wealth has not evolved homogeneously over time. It has gained importance during periods of large housing price increases (i.e. housing boom of 1984-1991) and it has lost importance in times when financial assets significantly increase (i.e. dot-com bubble of 1997-2001). The increase in the fraction of housing in the total portfolio of households has also been exacerbated by the steady decrease in the fraction of unincorporated business assets (from 23% in 1984 up to 10% in 2015), due mainly to the reduction in the importance of agriculture, as documented by Artola Blanco et al. (2019).

### III.II Wealth Inequality Series

This section presents the benchmark unified series for wealth distribution in Spain over the period 1984-2015 and the breakdowns by asset category (1984-2015) and age (1999-2015).

The wealth levels, thresholds and shares for 2015 are reported on Table 1. In 2015, average net wealth per adult in Spain was about 150,000 euros. Average wealth within the bottom 50% of the distribution was slightly less than 20,000 euros and their wealth share was 6.4%. Average wealth within the next 40% of the distribution was slightly more than 132,000 euros and their wealth share was 36%. Finally, average wealth within the top 10% was nearly 830,000 euros (i.e. about 5.6 times average wealth) and their wealth share was 57.4%.

Figure 3 displays the wealth distribution in Spain decomposed into three groups: top 10%, middle 40% and bottom 50%. The wealth share going to the bottom 50% has always
been very small ranging from 3 to 10%, the middle 40% has concentrated between 29% and 40% of total net wealth and the top 10% between 51% and 68% over the period of analysis. Looking at the dynamics, the top 10% wealth share dropped from the mid-eighties until beginning of the 1990s, at the expense of the increase in both the middle 40% and the bottom 50% of the distribution. The top 10% wealth share slightly increased during the nineties, decreased until the mid-2000s and has continued to increase since the end of the housing boom. Nonetheless, in 2015 the top 10% wealth share is still significantly lower (57.4%) than in 1984 (66.8%).

Contradictory movements in relative asset prices have an important impact on the composition of the different wealth groups, because they own very different asset portfolios. As it is shown on Figure ??, the bottom 50% of the distribution own mostly financial assets in the form of deposits in 2015, whereas housing assets are the main form of wealth for the middle of the distribution. As we move toward the top 10% and the top 1% of the distribution, financial assets (other than deposits) gradually become the dominant form of wealth. The same general pattern applies for the period 1984-2015, except that unincorporated assets have lost importance over time, due mainly to the reduction in agricultural activity among self-employees.

By decomposing by asset categories the evolution of the wealth shares going to the bottom 50%, middle 40%, top 10% and top 1%, the impact of asset price movements on wealth shares, particularly the impact of the 2000 stock market boom and the 2007 housing bust, are clearly captured (Figures 5 and 6). One particularity of the Spanish case is that housing constitutes a very important asset in the portfolio of households even at the top of the distribution. This has been the case during the whole period of analysis, but it has become more striking in the last fifteen years due to the increase in the value of dwellings. For instance, whereas in 2012 the top 10% and 1% of the wealth distribution in Spain own 26% and 9% of total net wealth in housing, respectively, in France these figures are 19% and 5%, respectively (Garbinti et al. (2017)).

Including offshore assets increases the top 1% wealth share on average from 22.7% to 25.7% over the period 1984-2015 (Figure 7). This difference is quite remarkable, taking
into account that during that period of time the country experienced a housing boom and both non-financial and financial assets held in Spain grew considerably, as it was discussed at the beginning of the section. In line with other advanced countries (Alstadsæter et al. (2019)), this finding suggests that the historical decline in Spanish wealth inequality over the twentieth century (Alvaredo and Artola (2017)), may be much less spectacular in actual facts than suggested by tax data.

Moving to the analysis by age, I find that average wealth is always very small at age 20 (less than 20% of average adult wealth), then rises sharply with age until age 60-70 reaching 150-170% of average adult wealth, and moderately decreases at ages above 60-70 (Figure 8, upper panel). Contrary to the pure life-cycle model with no bequest (the standard Modigliani triangle), average wealth does not seem to sharply decline at high ages and it remains at very high levels, which means that old-age individuals die with substantial wealth and transmit it to their offspring. This age-wealth profile has changed over the 2002-2015 period. Old individuals (+60) are better-off in 2015 than in 2007 and even more so than in 2002. Furthermore, the age at which individuals reach the maximum average wealth relative to total wealth has increased with the passing of time. In 2002 the maximum average wealth was reached at age 63, in 2007 at age 67 and in 2015 at age 75. In contrast, the young (20-39) are worse-off in 2015 than in 2007 and even more so than in 2002. Hence, the old have benefited from the economic crisis at the expense of the worsening-off of the young. This is consistent with the large increase in youth unemployment (Scarpetta et al. (2010)) after the burst of the crisis and at the same time the stability in Social Security pension payments. When decomposing the wealth distribution series by age, I find that wealth inequality is more pronounced for the young (20-39) than for the old (+60) and middle-old (40-59), for which wealth inequality is slightly lower than for the population taken as a whole (Figure 8, bottom panel). Wealth concentration among the young has significantly increased during the housing bust.

Finally, I compare the evolution of wealth inequality in Spain with other countries for which the capitalization method has been used: France and the US. Saez and Zucman (2016) estimate the distribution of wealth in the US using the income capitalization
method. They find that wealth concentration has followed a U-shaped evolution over the past 100 years. It was high in the beginning of the twentieth century, fell from 1929 to 1978, and has continuously increased since then. Their series of wealth shares reveal that the rise in wealth inequality is almost entirely due to the rise of the top 0.1% share.

Wealth concentration at the top 10 and 1% in Spain was similar to the US during the mid-eighties, but since the nineties the trends have diverged. Concentration at the top 10% and 1% decreased in Spain since the beginning of the nineties until the onset of the recent financial crisis – with the exception of the years of the dot-com bubble – after which concentration started to increase. In contrast, wealth concentration in the US has been steadily increasing since the late eighties. These differences have increased in the last decades due to the relative larger rise in wealth concentration in the US, specially for the top 1% (Figure 9). Contrary to the US case, the levels of wealth concentration in Spain in the eighties and beginning of the nineties were however much larger than in France. Since the mid-nineties Spain has converged to the levels of the rest of Western European countries such as France (Garbinti et al. (2017)). Even though all these series have been calculated using the capitalization method, comparisons should be made carefully since there still exist some methodological differences across the three countries.

IV How do Housing Booms and Busts Shape the Wealth Distribution?

Spain has experienced two housing booms (1984-1991, 1999-2007) and two housing busts (1992-1998, 2008-2015) in the last four decades. The existence of two episodes and the high level of disaggregation of the wealth distribution series allows a good understanding about the way housing booms and busts shape the wealth distribution. Figure 3 shows that wealth concentration decreased during the two housing boom episodes and stabilized or increased during the two housing busts. In order to understand which are the underlying forces driving the dynamics of wealth inequality during housing booms and busts, my starting point is to decompose the wealth distribution series using the following
transition equation:

\[ W^g_{t+1} = (1 + q^g_t)[W^g_t + s^g_t(Y^g_L_t + r^g_t W^g_t)], \] (5)

where \( W^g_t \) stands for the average real wealth of wealth group \( g \) at time \( t \), \( Y^g_L_t \) is the average real labor income of wealth group \( g \) at time \( t \), \( r^g_t \) the average rate of return of group \( g \) at time \( t \), \( q^g_t \) the average rate of real capital gains of wealth group \( g \) at time \( t \)\(^{21}\) and \( s^g_t \) the synthetic saving rate of wealth group \( g \) at time \( t \). The saving rate is synthetic because the identity of individuals in wealth group \( g \) changes over time due to wealth mobility.

I follow the same approach of Garbinti et al. (2017) and Saez and Zucman (2016) and calculate the synthetic savings rates that can account for the evolution of average wealth of each group \( g \) as a residual from the previous transition equation. This is straightforward since I observe variables \( W^g_t, W^g_{t+1}, Y^g_L_t, r^g_t \) and \( q^g_t \) in my 1999-2015 wealth distribution series. Hence, the three forces that can affect the dynamics of wealth inequality are income, saving rate and rate of return inequality.

In this paper, I go one step forward and further decompose the previous transition equation into three asset components: net housing, business assets and financial assets.\(^{22}\) The transition equation is as follows:

\[ W^g_{t+1} = W^g_{H,t+1} + W^g_{B,t+1} + W^g_{F,t+1}, \] (6)

where

\[ W^g_{H,t+1} = (1 + q^g_t)[W^g_{H,t} + s^g_{H,t}(Y^g_L_t + r^g_t W^g_{H,t})] \] (7)

\[ W^g_{B,t+1} = (1 + q^g_t)[W^g_{B,t} + s^g_{B,t}(Y^g_L_t + r^g_t W^g_{B,t})] \] (8)

\(^{21}\)Real capital gains are defined as the excess of average asset price inflation, given average portfolio composition of wealth group \( g \), over consumer price inflation.

\(^{22}\) I do a similar decomposition for analyzing the dynamics of aggregate wealth in Spain but they calculate real capital gains as a residual.
\begin{equation}
W_{F,t+1}^{g} = (1 + q_{t}^{g})[W_{F,t}^{g} + s_{F,t}^{g}(Y_{L,t}^{g} + r_{t}^{g}W_{F,t}^{L,g})]
\end{equation}

This new asset-specific decomposition allows me to quantify not only the relative importance of each channel (income, saving rate and rate of return inequality), but also the role played by each asset to explain the channels that drive the observed dynamics of the distribution of wealth. This is quite relevant for my purpose of understanding how housing booms and busts shape the wealth distribution since during these types of episodes one should expect housing to play a relative more important role in explaining the dynamics of wealth inequality than in other more stable periods.

Figure 10 depicts synthetic saving rates for the top 10%, middle 40% and bottom 50% over the period 1985-2015. Consistent with the high levels of concentration that we observe during this period in Spain, there is a high level of stratification between the top 10% who save annually on average 24% of their income and the middle 40% and bottom 50% who save 10% and 3% of their income on average. These figures are similar to the ones obtained for France and the US (Garbinti et al. (2017); Saez and Zucman (2016)).

Analyzing the dynamics of the saving rates during the two housing booms and busts I find that the stratification in saving rates between the rich and the poor is higher during booms than during busts. Stratification was more significant during the recent housing boom-bust episode than during the old one because the number of dwellings bought was larger and because the poor got much more indebted. The top panel of Figure 11 makes this point clearer. The saving rate on net housing increased for the middle 40% and bottom 50% wealth groups during the first housing boom, contrary to the decline in saving rates we observe for these two groups during the second housing boom. The top 10% wealth group, on the contrary, does get much less indebted keeping high saving rates on net housing during both housing boom episodes. Therefore, the observed dynamics in saving rates cannot explain the drop in wealth concentration during the boom.

During housing busts the top 10% increases its saving on financial assets in order to compensate for the decrease in housing prices (see bottom panel of Figure 11). This is the case in both housing bust episodes. Nonetheless, contrary to the first episode, the total
saving rate for the top 10% decreased during the housing bust, most likely because they had to consume a larger fraction of their income in order to smooth consumption. The middle 40% instead started to save more in order to repay the housing mortgages, so that the stratification in saving rates across the two wealth groups was reduced. Hence, even though saving rates did not play a role in the drop in wealth concentration during the boom, they did play a role during the bust. Thanks to diversification, the rich managed to keep higher saving rates than the middle and the bottom, which led to an increase in wealth concentration.

Figure 12 displays the evolution of flow rates of return for the different wealth groups over the 1984-2015 period. The further up one moves along the distribution, the higher are the rates of return. This is consistent with the large portfolio differences that were previously documented, that is, top wealth groups own more financial assets, like equity with higher rates of return than for instance housing. Rates of return have experienced quite similar trends across wealth groups over time. During the second housing boom the drop in rate of return for the top 10% wealth group was larger than for the other groups, which is consistent with the fall in wealth concentration during that period of time. Rates of return across wealth groups seem to reduce wealth concentration during booms but not to explain the increase in wealth concentration during busts.

Looking at the evolution of real capital gains, I find that differences in capital gains and not only in rates of return have driven the dynamics of wealth inequality over the boom and bust (Figure 13). Capital gains are larger during booms among the middle 40% than among the top 10% because the housing market outperforms the stock market, contributing to the reduction in wealth concentration. Capital gains do not seem to contribute to the increase in wealth concentration during busts since they converge across wealth groups in both episodes.

The third force which can drive the dynamics in wealth concentration is labour income inequality. Figure 14 depicts the evolution of labor income shares for the different wealth groups over the 1984-2015 period. The evolution of the labor share for the top 10% wealth group has been quite stable during this period of time, so that it does not seem
to have played an important role in explaining the dynamics of wealth inequality during the booms nor the busts.

Finally, in order to corroborate the suggestive findings derived from the wealth accumulation decomposition, I simulate the top wealth shares fixing the composition of assets to 2002. Figure 15 shows that in the absence of a change in the composition of assets after 2002, the drop in wealth concentration during the boom would have still still been present, but the increase in wealth concentration would have disappeared, suggesting that saving rates – in particular, the substitution from housing to financial assets – have played an important role in explaining the increase in wealth concentration during the bust.

V Reconciliation and Test of the Mixed Capitalization-Survey Method with Other Sources

V.I Comparison with Other Sources

V.I.I Wealth Tax

The wealth tax in Spain was introduced for the first time in 1978 by law 50/1977. Initially, it was meant to be "transitory" and "exceptional". The tax rate was relatively small, with a maximum of 2%. The aim of the Spanish wealth tax was basically to complement the Spanish personal income tax, which had limited redistributive goals. Tax filing was done on an individual basis, with the exception of married couples under joint tenancy. Since 1988, married couples can file individually.

In 1992, a major reform by the Law 19/1991 put an end to the transitory an exceptional character of the tax. It established a strictly individual filing and introduced changes in some of the included components as well as in their valuation rules. In year 2008, the tax was not abolished but a bonus of 100% was introduced by law 4/2008. Nevertheless, the economic crisis and the lack of funds of the Spanish Tax Agency, reactivated the wealth tax from exercise 2011 (payable in 2012) up to 2015 (payable in 2016).

Alvaredo and Saez (2009) use wealth tax returns and the Pareto interpolation method
to construct long run series of wealth concentration for the period 1982 to 2007. The pro-
gressive wealth tax has high exemption levels and only the top 2-3% wealthiest individuals
file wealth tax returns. Thus, they limit their analysis of wealth concentration to the top
1% and above. This is a general limitation of using wealth tax data, the middle and
bottom of the distribution can not be analyzed. Durán-Cabrè and Esteller-Moré (2010)
also use wealth tax returns to analyze the distribution of wealth at the top and obtain
similar results to them. Their approach complements theirs by offering a more precise
treatment of the correction of fiscal underassessment and tax fraud in real estate, which
is the main asset in Spaniards’ portfolios.

Results using wealth tax data and the capitalization method are quite similar, specially
for the top 0.1% and 0.01% (Figure 16). In line with the trends observed in Alvaredo
and Saez (2009), my estimates also reveal a fall in concentration at the top 1% during
the eighties and an increase in concentration during the nineties. Concentration levels
are larger using capitalized income shares rather than wealth taxes, specially at times in
which asset prices significantly grow, such as the of the dot-com bubble and the most
recent housing boom and bust of the 2000s.

There are several conceptual and methodological differences across the two methods
which might explain these differences. First, Alvaredo and Saez (2009) use financial
wealth from both households and non-profit institutions serving households in their wealth
denominator, rather than only financial household wealth. Second, they exclude pensions
from the wealth denominator because they are exempted from the wealth tax. Hence, they
use slightly different wealth aggregates to the ones used in this paper (Table A10). Third,
they use real state wealth at assessed value as reported in the wealth tax and update it
based on the differences between real state total assessed values and market values. In
contrast, I use the series of housing wealth at market prices of Artola Blanco et al. (2019)
and impute primary residence housing wealth for the period 1999-2015 using the Survey of
Household Finances. Another difference is that they use the Pareto interpolation method
in order to obtain top wealth shares because they have tabulated data. Finally, they
use the tax unit and not the individual unit as unit of analysis. The exclusion pension
funds, together with the different valuation of housing wealth are most likely the biggest
determinants in the differences observed in the shares using the two methods. The reason
is that differences are more pronounced for the rich (top 1%) than for the very rich (top
0.1% and top 0.01%), with the rich owning relative more real assets and pension funds
than the very rich.

V.I.II The Survey of Household Finances

The Survey of Household Finances provides a representative picture of the structure of
household incomes, assets and debts at the household level and does an oversampling
at the top, as it was already pointed out in section II. It exists for five waves (2002, 2005,
2008, 2011 and 2014) and it is elaborated by the Bank of Spain.

Anghel et al. (2018) use the five waves of the survey to reconstruct the wealth distrib-
ution. They present results for the top 10%, 5% and 1% wealth groups. Their estimates
are similar in trend to the series of Alvaredo and Saez (2009) using wealth tax returns and
the series using the capitalization method but different in levels. For instance, whereas
they find a top 1% wealth share of 13.5% in 2005, the estimates using wealth tax returns
and the mixed capitalization-survey method are 18.9% and 20.6%, respectively.

There are notable differences in terms of definitions and methodology between our
estimates and the study of Anghel et al. (2018). First, in this paper individual units are
used while the SHF uses households to define each fractile. Second, they use a broader
definition of wealth including collectibles and consumer durables.

In an attempt to do a more consistent comparison across the two sources, I have also
constructed the wealth distribution series with the SHF under the same wealth definition
and assumptions than for the mixed capitalization-survey method. Households are split
into individuals and wealth is assigned proportionally to all members of the household,
except from children, who are only given a fraction of wealth held in bank accounts.
Moreover, only individuals aged 20 and above are considered. Even though trends are the
same, levels are still quite different across the two methods (Figure 17, panel (a)). Whereas
the top 10% holds 57.4% using the capitalization method in 2011, it only concentrates
47.6% using the survey-method. Contrary to what happens at the top 10%, the middle 40% and the bottom 50% concentrate more wealth using the survey (44.7% and 7.7%, respectively) than the capitalization method (36.1% and 6.5%, respectively). However, if on top of the previous adjustments, I calculate the SHF wealth shares using the same population and wealth totals as in the mixed capitalization-survey method, that is, the ones consistent with the Population Census and National Accounts, results are almost identical (Figure 17, panel (b)). This is also the case for the very top of the distribution (top 1% and 0.01%).

In general, it is a challenge for wealth surveys to accurately capture wealthy individuals because of limited sample size and low response rates at the very top. Thus, as it is the case with income, wealth shares tend to be lower using survey data instead of tax data. This is the case in the US, as documented by Saez and Zucman (2016). Nonetheless, this does not seem to be the case in Spain, since after adjusting for population and wealth totals results are almost the same. This is also the case even looking at very top groups (Figure 18). Hence, the Spanish SHF is extremely useful not only to analyze the bottom and middle of the distribution, which as it has already been mentioned it is not entirely possible using only tax data, but also to understand the wealth inequality dynamics at the top. The main reason why the mixed capitalization-survey method is used is because instead of only five data points, it allows to cover on an annual basis a much longer period of time.

V.II Testing the Mixed Capitalization-Survey Method

As already mentioned, the wealth distribution series are obtained by assuming that within a given asset class, everybody has the same capitalization factor. Computing wealth shares by capitalizing income consists of allocating the wealth for each asset recorded in the Non-financial and Financial Accounts to each group of the distribution based on how the income for this asset is distributed. Hence, this method does not require to know the exact rate of return for each asset type, as long as the distribution of each capital income category is similar to the distribution of its corresponding wealth category.
Figures 17 (panel b) and 18 (panel (b)) are already a test for the well-behaved wealth inequality trends using the mixed capitalization-survey method. Nonetheless, I go one step forward and test whether rates of return are flat along the distribution using the micro-files from personal income tax records linked to wealth tax records for the period 2002-2007. This allows me to calculate the individual rate of return on deposits and fixed-income securities as the ratio of the interest they earn in these assets and the total value they hold in these assets. Whether ranking individuals by the total amount of deposits and fixed-income securities they owned or by total net wealth, rates of return are flat along the distribution, meaning that at least for these type of assets the assumption of constant returns by asset-stype seems plausible in this context (Figure 19).

As another robustness check, I use the SHF and compare the wealth shares using direct reported wealth, with the shares calculated by capitalizing the income from the survey. These wealth shares include the same assets as the benchmark capitalized shares in this paper, except for owner-occupied housing, life insurance, pension and investment funds. The reason is that the SHF does not include the income generated by these assets in any of the four waves. Results using direct and capitalized wealth shares are very similar (Figure 20). All these robustness checks suggest that the capitalization method derives robust wealth distribution series in the Spanish context.

VI Implications of Capital Income Taxation for Differences in Saving Rates and Wealth Inequality

In Section III, it has been shown that differences in saving rates, specially, changes in asset-specific saving rates, are the main drivers of the increase in wealth concentration during housing busts. However, the increase in wealth concentration during the recent housing bust has been more pronounced than during the housing bust of the nineties.

Results presented here are only for 2005, but they are very similar for the rest of years available (2002-2007). Ideally, rates of return for all asset categories should be computed, but unfortunately for the rest of assets it is not possible to perfectly link the income with the wealth reported, since the income generated by many assets (i.e. primary residence, investment funds, etc. is exempted from the personal income tax.
Furthermore, the increase in the saving rate of financial assets for the top 10% wealth group has been also larger during the recent housing bust. Is there any institutional factor which might explain these differences? The answer is yes.

In 2006, the year prior to the beginning of the housing bust, a large reform was introduced on the personal income tax aimed at incentivizing savings. The minimum exempted was increased from 3,400 to 9,000 euros, dividends were exempted up to 1,500 euros and a significant change in the progressive tax schedule was introduced. Financial income (i.e. interest and dividends) and capital gains that used to be taxed under the progressive tax schedule – such as labor, business and rental income–, started to be taxed under a flat tax rate of 18% (Figures 21 and 22). This reform created a wedge between the taxation of financial income and the rest of capital income components such as rental and business income. The reform was announced in 2005, approved in November 2006 and in place as of 1st of January 2007.

The new flat tax led to a decline in the total average tax rate for all taxpayers holding financial income except from taxpayers in the lowest tax bracket since their marginal tax rate was 15% prior to the reform. To give a clear sense of the large identifying variation, Figure 23 (upper panel) shows the mechanical variation in marginal net-of-tax rates by income tax bracket. For instance, the top income tax bracket experienced a decline in the marginal tax rate on financial income of 50%.

In order to evaluate whether the introduction of the flat tax incentived savings, I will use the personal income tax panel that has been previously used to construct the wealth distribution series. This panel also includes the wealth tax records for those taxpayers who are rich enough to file wealth taxes.

I will compare the evolution of financial income by the group who experienced a tax cut (treatment) versus the group who experienced a tax increase (control) before and after the reform using a differences-in-differences design. The first problem that arises is that taxpayers in the two groups are quite different since they have very different income levels and composition and hence, they might have very different saving behaviors for reasons different to the reform. To deal with this issue, I restrict my analysis to personal income
taxpayers who also file the wealth tax, so that both groups are similar in their wealth levels. Figure 23 (bottom panel) shows the mechanical variation in marginal net-of-tax rates by income tax bracket among wealth taxpayers. As expected, the fraction of wealth taxpayers who are in the top personal income tax bracket is quite large, but there are still some taxpayers at lower brackets, even at the lowest personal income tax bracket.

Graphical evidence on the evolution of average interest among the different groups shows that interest experienced similar trends among all brackets before the reform (Figure 24).\textsuperscript{24} Hence, the paralell trends assumption seems to be satisfied. After the reform, trends started to diverge with increases in average interest larger for upper brackets. This is consistent, since the tax cut was largest for the top income bracket.

Results from the differences-in-differences estimation show that average interest increased on average 50\% more for the treatment relative to the control after the reform (Figure 25). Hence, this reform led to an increase in savings on financial assets that was more pronounced by the rich and helps to explain why the increase in wealth concentration and in saving rates on financial assets during the recent housing bust was larger than during the old housing bust.\textsuperscript{25}

\section*{VII Conclusion}

This paper presents unified wealth distribution series for Spain from bottom to the top over the period 1984 to 2015. They are obtained by combining different sources (tax records, national accounts, wealth surveys) and a mixed capitalization-survey method. Wealth concentration dropped in Spain since the eighties until the end of the housing boom of the 2000s and it increased afterwards during the years of the housing bust.

Wealth concentration declines during housing booms and increases during housing busts. My findings suggest that differences in rates of return and capital gains are the main drivers of wealth inequality dynamics during housing booms and saving rates during

\textsuperscript{24}I focus on interest because dividends and capital gains are quite volatile due to the crisis and any type of saving behavior is very hard to identify.

\textsuperscript{25}In a future version of the paper, I plan to carry counterfactual simulations with these estimates to quantify which fraction of the increase in wealth concentration is due to this reform.
housing busts. Rich individuals diversify their portfolio during the housing bust substituting housing for financial assets contributing to revert the decreasing trend in wealth concentration of the housing boom. The trends and levels in the wealth shares are very similar to the ones obtained by Alvaredo and Saez (2009) using wealth tax returns.

The recent increase in wealth concentration during the housing bust was exacerbated by the introduction of a large capital income tax reform which created a wedge between the taxation of housing and financial assets and benefited relatively more the top of the wealth distribution. The results are clear evidence about the way taxes can affect wealth inequality by distorting saving behavior.

The analysis of the two Spanish housing booms and busts episodes together with the mechanisms indentified in this paper provide new evidence to discipline new macroeconomic theories of wealth inequality, asset price changes and capital income taxes.
References


FIGURE 1: LEVEL AND COMPOSITION OF HOUSEHOLD WEALTH IN SPAIN, 1984-2015

Notes: The figure depicts the level and composition of aggregate household wealth from 1984 to 2015 expressed as a percentage of national income. Net housing includes owner- and tenant-occupied housing net of mortgage debt, the latter approximated by total household liabilities. Unincorporated business assets include the total value of the business of sole proprietorships. Financial assets cover equities, investment funds, fixed income assets (mainly bonds), saving and current deposits, currency, life insurance reserves and pension funds, excluding Social Security. The vertical black lines at 1991, 1998 and 2007 denote the last year of the first housing boom, first housing bust and second housing boom, respectively.
FIGURE 2: COMPOSITION OF HOUSEHOLD WEALTH IN SPAIN, 1984-2015

Notes: The figure displays the composition of aggregate household wealth from 1984 to 2015 expressed as a percentage of total net household wealth. Net housing includes owner- and tenant-occupied housing net of mortgage debt, the latter approximated by total household liabilities. Unincorporated business assets include the total value of the business of sole proprietorships. Financial assets cover equities, investment funds, fixed income assets (mainly bonds), saving and current deposits, currency, life insurance reserves and pension funds, excluding Social Security. The vertical black lines at 1991, 1998 and 2007 denote the last year of the first housing boom, first housing bust and second housing boom, respectively.
FIGURE 3: WEALTH DISTRIBUTION IN SPAIN, 1984-2015

Notes: The figure depicts the breakdown of the wealth distribution in Spain for years 1984-2015 into three groups: top 10%, middle 40% and bottom 50%. Wealth includes net housing, unincorporated business assets and financial assets (equities, fixed income assets (mainly bonds), saving and current deposits, currency, life insurance reserves, pension and investment funds). Wealth shares are constructed by capitalizing taxable income and accounting for the assets that do not generate taxable income (Primary residence (1999-2015), life insurance, pension and investment funds) using income and wealth surveys. The unit of analysis is the adult individual (+20), excluding the regions of Basque Country and Navarre since they do not belong to the Common Fiscal Regime and hence, they are not included in personal income tax samples. The vertical black lines at 1991, 1998 and 2007 denote the last year of the first housing boom, first housing bust and second housing boom, respectively.
FIGURE 4: ASSET COMPOSITION BY WEALTH LEVEL IN SPAIN, 2015

Notes: The figure depicts the asset composition by wealth group in 2015 using the mixed capitalization-survey method. Net housing includes owner- and tenant-occupied housing net of mortgage debt, the latter approximated by total household liabilities. Unincorporated business assets include the total value of the business of sole proprietorships.

Notes: The figure displays the composition of the top 1% (panel a) and top 10% (panel b) wealth shares in Spain using the mixed capitalization-survey method for the period 1984-2015. Net housing includes owner- and tenant-occupied housing net of mortgage debt, the latter approximated by total household liabilities. Unincorporated business assets include the total value of the business of sole proprietorships. Financial assets cover equities, investment funds, fixed income assets (mainly bonds), saving and current deposits, currency, life insurance reserves and pension funds, excluding Social Security.

Notes: The figure displays the composition of the middle 40% (panel a) and bottom 50% (panel b) wealth shares in Spain using the mixed capitalization-survey method for the period 1984-2015. Net housing includes owner- and tenant-occupied housing net of mortgage debt, the latter approximated by total household liabilities. Unincorporated business assets include the total value of the business of sole proprietorships. Financial assets cover equities, investment funds, fixed income assets (mainly bonds), saving and current deposits, currency, life insurance reserves and pension funds, excluding Social Security.
FIGURE 7: COMPOSITION OF TOP 1% WEALTH SHARE INCLUDING UNREPORTED OFFSHORE WEALTH IN SPAIN, 1984-2015

Notes: The figure depicts the composition of the top 1% wealth share in Spain including unreported offshore assets both in the numerator and in the denominator. The series of unreported offshore assets used is the one displayed in Figure A1 (panel (a)). Unreported offshore assets are assigned proportionally to the top 1%.
Notes: The figure in panel (a) displays age-wealth profiles as a % of average wealth for years 2002, 2007 and 2015 in Spain. The figure in panel (b) depicts the breakdown of the wealth distribution in Spain over the period 1999-2015 into three age groups: the young (20-39), the middle-old (40-59) and the old (+60). Both figures have been elaborated based on the benchmark series using the mixed capitalization-survey method. Results are only available from 1999 onwards, since there is no information available on age in the micro-files for previous years.
TOP 10% WEALTH CONCENTRATION IN ADVANCED ECONOMIES, 1984-2015

Year as a % of total personal wealth (in %)

Spain France US

(a) Top 10% Wealth Concentration in Advanced Economies, 1984-2015

TOP 10% WEALTH CONCENTRATION IN ADVANCED ECONOMIES, 1984-2015

Year as a % of total personal wealth (in %)

Spain France US

(b) Top 1% Wealth Concentration in Advanced Economies, 1984-2015

FIGURE 9: INTERNATIONAL COMPARISON OF TOP WEALTH SHARES, 1984-2015

Notes: The figure compares the top 10% (panel (a)) and 1% (panel (b)) wealth shares in Spain with the rest of countries (US (Saez and Zucman (2016)) and France (Garbinti et al. (2017)) for which the capitalization has been used.
FIGURE 10: SAVING RATES BY WEALTH GROUP IN SPAIN, 1985-2015

Notes: This figure displays synthetic saving rates for the top 10%, middle 40%, and bottom 50% using a five year moving average from 1985 up to 2015. Synthetic saving rate $s^g_t$ for wealth group $g$ in year $t$ is defined so that $W^g_{t+1} = (1 + q^g_t)[W^g_t + s^g_t(Y^g_{L_t} + r^g_tW^g_t)]$, where $W^g_t$ stands for the average real wealth of wealth group $g$ at time $t$, $Y^g_{L_t}$ is the average real labor income of wealth group $g$ at time $t$, $r^g_t$ the average rate of return of group $g$ at time $t$, $q^g_t$ the average rate of real capital gains of wealth group $g$ at time $t$ and $s^g_t$ the synthetic saving rate of wealth group $g$ at time $t$. The vertical black lines at 1991, 1998 and 2006 denote the last year of the first housing boom, first housing bust and second housing boom, respectively.
Notes: Panels (a) and (b) plot the synthetic saving rates on net housing and financial assets for the top 10%, middle 40%, and bottom 50%, respectively, using a five year moving average from 1985 up to 2015. Synthetic saving rate $s^g_{A,t}$ for wealth group $g$ in year $t$ is defined so that $W^g_{A,t+1} = (1 + q^g_t)W^g_{A,t} + s^g_{A,t}(Y^g_t + r^g_tW^g_{H,t})$, where $W^g_{A,t}$ stands for the average value of asset $A$ (i.e. net housing or financial assets) of wealth group $g$ at time $t$, $s^g_{A,t}$ the synthetic saving rate on asset $A$ of wealth group $g$ at time $t$ and the rest of variables are the same as in Figure 10. For each wealth group, the sum of these two saving rates each year, together with the saving rate on business assets are equal to the total annual saving rate by wealth group. The vertical black lines at 1991, 1998 and 2007 denote the last year of the first housing boom, first housing bust and second housing boom, respectively.

FIGURE 11: ASSET-SPECIFIC SAVING RATES BY WEALTH GROUP IN SPAIN, 1985-2015
FIGURE 12: FLOW RETURNS BY WEALTH GROUP IN SPAIN, 1984-2015

Notes: The figure depicts the top 10%, middle 40% and bottom 50% flow returns in Spain using 5-year moving averages over the period 1984-2015. The flow return is the ratio of average income to average wealth in wealth group $g$. 

FIGURE 13: REAL CAPITAL GAINS BY WEALTH GROUP IN SPAIN, 1985-2015

Notes: The figure depicts the top 10%, middle 40% and bottom 50% real rates of capital gains in Spain using 5-year moving averages over the period 1985-2015. The total return is the sum of the flow return, that is the ratio of average income to average wealth in wealth group $g$, and capital gains, which are defined as the excess of average asset price inflation, given average portfolio composition of wealth group $g$, over consumer price inflation.
FIGURE 14: LABOR INCOME CONCENTRATION BY WEALTH GROUP, 1984-2015

Notes: The figure depicts the concentration of labor income among the top 10%, middle 40% and bottom 50% wealth groups over the period 1984-2015.

Notes: The figure depicts the simulated top wealth distribution series fixing the asset composition to year 2002 from 2003 onwards.
FIGURE 16: WEALTH TAX TABULATIONS VS. MIXED CAPITALIZATION-SURVEY METHOD IN SPAIN, 1984-2007

Notes: The figure compares the top 1%, 0.1% and 0.01% wealth shares in Spain using wealth tax tabulations and the capitalization method. The wealth shares using wealth tax tabulations are extracted from Alvaredo and Saez (2009). They use wealth tax returns and the Pareto interpolation method. There are important differences in the concepts and methodology used in Alvaredo and Saez (2009) and in this paper. First, they consider the wealth of both households and non-profit institutions serving households rather than only household wealth. Second, they exclude pensions from the wealth denominator and they do not include business assets. Third, they use real state declared, being for some individuals the cadastral value. By contrast, I impute wealth from owner-occupied housing using the Survey of Household Finances and the Housing Market Indicators using series at market prices. Finally, one last difference is that they use tax units instead of individual units as units of analysis.
### FIGURE 17: WEALTH SHARES: MIXED CAPITALIZATION-SURVEY METHOD VS. SHF IN SPAIN, 2002-2014

Notes: The figure compares the top 10%, middle 40% and bottom 50% wealth shares in Spain using the capitalization method and the Survey of Household Finances. In panel (a) the SHF wealth shares are calculated using the direct totals of the SHF, whereas in panel (b) the SHF wealth shares are calculated using the Census of Population and NA totals, that is, the same totals as the ones used in the mixed capitalization-survey technique. This is done by proportionally rescaling the wealth shares to arrive to the Census of Population and NA totals. Note that contrary to the capitalized wealth shares, the SHF includes the regions of País Vasco and Navarra. In both panels (a) and (b), the wealth shares with the survey data have been constructed using the five waves of the Survey of Household Finances from the Bank of Spain (2002, 2005, 2008, 2011 and 2014). In order to ensure consistency across methods, households in the survey are split into individuals and wealth is assigned proportionally to all members of the household, except from children, who are only given proportionally wealth held in bank accounts. Moreover, the population considered excludes individuals aged less than 20.
FIGURE 18: TOP WEALTH SHARES: MIXED CAPITALIZATION-SURVEY METHOD vs. SHF IN SPAIN, 2002-2014

Notes: The figure compares the top 1%, and top 0.1% wealth shares in Spain using the capitalization method and the Survey of Household Finances. In panel (a) the SHF wealth shares are calculated using the direct totals of the SHF, whereas in panel (b) the SHF wealth shares are calculated using the Census of Population and NA totals, that is, the same totals as the ones used in the mixed capitalization-survey technique. The SHF top wealth shares are constructed using the same methodology as in Figure 17.
(a) Ranking individuals according to total deposits and fixed-income securities

Return on deposits and fixed-income securities, 2005
(using Spanish wealth and personal income tax returns)

(b) Ranking individuals according to total net wealth

Return on deposits and fixed-income securities, 2005
(using Spanish wealth and personal income tax returns)

FIGURE 19: DISTRIBUTION OF RETURNS ON DEPOSITS AND FIXED INCOME SECURITIES IN SPAIN, 2005

Notes: The figure depicts the distribution of the rates of return on deposits and fixed-income securities including confidence intervals. Individuals are ranked according to total deposits and fixed-income securities (panel a) and to total net wealth (panel b). The series have been constructed using Spanish micro-files from personal income tax records linked to wealth tax records for the period 2002-2007. Results presented here are only for 2005, but they are very similar for the rest of years. The individual rate of return on deposits and fixed-income securities has been calculated as the ratio of the interest each individual earns in these assets and the total value held in these assets. Individuals with rates of return larger than 10% have been excluded since these high values are most likely due to measurement error. They only account for 3% of the total sample.
FIGURE 20: SHF WEALTH SHARES: DIRECT VS. CAPITALIZED WEALTH IN SPAIN, 2002-2014

Notes: The figure compares the top 10%, 10 to 1% and 0.1% wealth shares in Spain using direct and capitalized wealth shares from the SHF. These wealth shares include the same assets as the benchmark capitalized shares in this paper, except for owner-occupied housing, life insurance, pension and investment funds. The reason is that the SHF does not include the income generated by these assets in any of the five waves.
FIGURE 21: PERSONAL INCOME TAX SCHEDULE BEFORE THE REFORM
FIGURE 22: PERSONAL INCOME TAX SCHEDULE AFTER THE REFORM
FIGURE 23: MECHANICAL CHANGES IN MARGINAL NET OF TAX RATES ON FINANCIAL INCOME
FIGURE 24: TIME SERIES OF INTEREST INCOME AMONG WEALTH TAXPAYERS
Difference between Tax cuts and Tax increases among Wealth Taxpayers

Brackets 2-5 (Treatment) vs. Bracket 1 (Control)

FIGURE 25: DiD RESULTS
## TABLE 1: AVERAGE ANNUAL RATES OF RETURN IN SPAIN, 1984-2015

Notes: This table reports the average total returns on household wealth by asset category over the 1984-2015 period in Spain. The total returns are the sum of the flow returns and of the real rates of capital gains from national accounts. The returns are gross of all taxes but net of capital depreciation. Real capital gains correspond to asset price inflation in excess of consumer price inflation. The rates of return are reported for the full period 1984-2015 and further decomposed for the two different housing booms and busts (1984-1991, 1992-1998, 1999-2007 and 2007-2015). All figures are presented in percentages.
<table>
<thead>
<tr>
<th>Wealth group</th>
<th>Number of adults</th>
<th>Wealth threshold</th>
<th>Average wealth</th>
<th>Wealth share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full population</td>
<td>35,082,703</td>
<td>0€</td>
<td>147,395€</td>
<td>100%</td>
</tr>
<tr>
<td>Bottom 50%</td>
<td>17,541,352</td>
<td>0€</td>
<td>19,413€</td>
<td>6.6%</td>
</tr>
<tr>
<td>Middle 40%</td>
<td>14,033,081</td>
<td>61,890€</td>
<td>132,643€</td>
<td>36.0%</td>
</tr>
<tr>
<td>Top 10%</td>
<td>3,721,375</td>
<td>284,390€</td>
<td>829,942€</td>
<td>57.4%</td>
</tr>
<tr>
<td>incl. Top 1%</td>
<td>372,138</td>
<td>1,416,646€</td>
<td>3,393,448€</td>
<td>24.9%</td>
</tr>
<tr>
<td>incl. Top 0.1%</td>
<td>37,214</td>
<td>4,894,606€</td>
<td>12,482,984€</td>
<td>10.2%</td>
</tr>
<tr>
<td>incl. Top 0.01%</td>
<td>3,721</td>
<td>19,130,185€</td>
<td>51,017,990€</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

**TABLE 2: WEALTH THRESHOLDS AND SHARES IN SPAIN, 2015**

Notes: This table reports statistics on the distribution of wealth in Spain in 2015 obtained using the mixed capitalization-survey method. The unit is the adult individual (20-year-old and over; net wealth of married couples is split into two). Fractiles are defined relative to the total number of adult individuals in the population.
## Appendix

<table>
<thead>
<tr>
<th>Year</th>
<th>HH</th>
<th>NPISH</th>
<th>HH + NPISH</th>
<th>NPISH/(HH + NPISH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>440,246€</td>
<td>7,264€</td>
<td>447,509€</td>
<td>1.6%</td>
</tr>
<tr>
<td>1996</td>
<td>482,216€</td>
<td>7,018€</td>
<td>489,233€</td>
<td>1.4%</td>
</tr>
<tr>
<td>1997</td>
<td>553,869€</td>
<td>7,613€</td>
<td>561,482€</td>
<td>1.4%</td>
</tr>
<tr>
<td>1998</td>
<td>654,137€</td>
<td>8,493€</td>
<td>662,630€</td>
<td>1.3%</td>
</tr>
<tr>
<td>1999</td>
<td>698,695€</td>
<td>10,371€</td>
<td>709,067€</td>
<td>1.5%</td>
</tr>
<tr>
<td>2000</td>
<td>667,385€</td>
<td>10,644€</td>
<td>678,029€</td>
<td>1.6%</td>
</tr>
<tr>
<td>2001</td>
<td>681,287€</td>
<td>11,710€</td>
<td>692,998€</td>
<td>1.7%</td>
</tr>
<tr>
<td>2002</td>
<td>641,063€</td>
<td>12,663€</td>
<td>653,726€</td>
<td>1.9%</td>
</tr>
<tr>
<td>2003</td>
<td>725,743€</td>
<td>13,705€</td>
<td>739,449€</td>
<td>1.9%</td>
</tr>
<tr>
<td>2004</td>
<td>776,002€</td>
<td>13,568€</td>
<td>789,570€</td>
<td>1.7%</td>
</tr>
<tr>
<td>2005</td>
<td>851,742€</td>
<td>15,346€</td>
<td>867,089€</td>
<td>1.8%</td>
</tr>
<tr>
<td>2006</td>
<td>975,711€</td>
<td>17,824€</td>
<td>993,535€</td>
<td>1.8%</td>
</tr>
<tr>
<td>2007</td>
<td>927,851€</td>
<td>19,231€</td>
<td>947,081€</td>
<td>2.0%</td>
</tr>
<tr>
<td>2008</td>
<td>703,406€</td>
<td>18,544€</td>
<td>721,950€</td>
<td>2.6%</td>
</tr>
<tr>
<td>2009</td>
<td>767,973€</td>
<td>17,136€</td>
<td>785,108€</td>
<td>2.2%</td>
</tr>
<tr>
<td>2010</td>
<td>771,583€</td>
<td>15,474€</td>
<td>787,057€</td>
<td>2.0%</td>
</tr>
<tr>
<td>2011</td>
<td>842,345€</td>
<td>14,917€</td>
<td>857,262€</td>
<td>1.7%</td>
</tr>
<tr>
<td>2012</td>
<td>873,475€</td>
<td>14,098€</td>
<td>887,573€</td>
<td>1.6%</td>
</tr>
<tr>
<td>2013</td>
<td>1,073,297€</td>
<td>17,099€</td>
<td>1,090,396€</td>
<td>1.6%</td>
</tr>
<tr>
<td>2014</td>
<td>1,153,927€</td>
<td>36,624€</td>
<td>1,190,551€</td>
<td>3.1%</td>
</tr>
<tr>
<td>2015</td>
<td>1,243,615€</td>
<td>37,232€</td>
<td>1,280,847€</td>
<td>2.9%</td>
</tr>
<tr>
<td>2016</td>
<td>1,289,526€</td>
<td>36,483€</td>
<td>1,326,010€</td>
<td>2.8%</td>
</tr>
<tr>
<td>2017</td>
<td>1,338,376€</td>
<td>39,954€</td>
<td>1,378,330€</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

**TABLE A1: HOUSEHOLDS (HH) AND NON-PROFIT INSTITUTIONS SERVING HOUSEHOLDS (NPISH) NET WEALTH, 1995-2017**

Notes: This table reports total household (HH) and non-profit institutions serving households (NPISH) net wealth over the period 1995-2017. These series are part of the Financial Accounts (ESA 2010) constructed by the Bank of Spain. Values are reported in millions of current euros and correspond to the wealth as of December of each year. The last column shows the NPISH net wealth as a share of total HH and NPISH net wealth.
### COMPOSITION OF HOUSEHOLD DEBT, 2002-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary residence</th>
<th>Other real estate properties</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>56%</td>
<td>24%</td>
<td>20%</td>
</tr>
<tr>
<td>2005</td>
<td>57%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>2008</td>
<td>59%</td>
<td>25%</td>
<td>16%</td>
</tr>
<tr>
<td>2011</td>
<td>63%</td>
<td>24%</td>
<td>13%</td>
</tr>
<tr>
<td>2014</td>
<td>69%</td>
<td>19%</td>
<td>12%</td>
</tr>
</tbody>
</table>

**TABLE A2: COMPOSITION OF HOUSEHOLD DEBT, 2002-2014**

Notes: This table reports the composition of household debt among total Spanish households over the period 2002-2014. These figures are part of the set of tables published by the Bank of Spain for each wave of the Survey of Household Finances (Encuesta Financiera de las Familias). All figures are presented in percentages.

### COLLECTIBLES AND CONSUMER DURABLES, 2002-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Collectibles (current billion euros)</th>
<th>Consumer durables (current billion euros)</th>
<th>Collectibles (as a % of net household wealth)</th>
<th>Consumer durables (as a % of net household wealth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>12.5€</td>
<td>277.9€</td>
<td>0.5%</td>
<td>11.5%</td>
</tr>
<tr>
<td>2005</td>
<td>22.1€</td>
<td>381.1€</td>
<td>0.5%</td>
<td>9.0%</td>
</tr>
<tr>
<td>2008</td>
<td>24.9€</td>
<td>468.1€</td>
<td>0.5%</td>
<td>9.1%</td>
</tr>
<tr>
<td>2011</td>
<td>46.1€</td>
<td>501.1€</td>
<td>0.9%</td>
<td>9.6%</td>
</tr>
<tr>
<td>2014</td>
<td>40.7€</td>
<td>450.0€</td>
<td>0.8%</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

**TABLE A3: COLLECTIBLES AND CONSUMER DURABLES, 2002-2014**

Notes: This table reports the value of collectibles and consumer durables (both in current billion euros and as a share of net household wealth) for Spanish households using the five waves of the Survey of Household Finances (Encuesta Financiera de las Familias). Net household wealth includes collectibles and consumer durables.
<table>
<thead>
<tr>
<th>Year</th>
<th>Basque C.</th>
<th>Navarre</th>
<th>Spain</th>
<th>Share of Basque C. and Navarre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>1,469,524</td>
<td>359,267</td>
<td>25,870,425</td>
<td>7.1%</td>
</tr>
<tr>
<td>1985</td>
<td>1,487,232</td>
<td>363,769</td>
<td>26,218,074</td>
<td>7.1%</td>
</tr>
<tr>
<td>1986</td>
<td>1,503,271</td>
<td>365,043</td>
<td>26,544,445</td>
<td>7.0%</td>
</tr>
<tr>
<td>1987</td>
<td>1,519,163</td>
<td>372,389</td>
<td>26,882,512</td>
<td>7.0%</td>
</tr>
<tr>
<td>1988</td>
<td>1,533,784</td>
<td>376,706</td>
<td>27,202,969</td>
<td>7.0%</td>
</tr>
<tr>
<td>1989</td>
<td>1,547,408</td>
<td>380,890</td>
<td>27,504,179</td>
<td>7.0%</td>
</tr>
<tr>
<td>1990</td>
<td>1,560,837</td>
<td>385,100</td>
<td>27,807,783</td>
<td>7.0%</td>
</tr>
<tr>
<td>1991</td>
<td>1,575,548</td>
<td>389,597</td>
<td>28,146,601</td>
<td>7.0%</td>
</tr>
<tr>
<td>1992</td>
<td>1,594,355</td>
<td>395,383</td>
<td>28,572,172</td>
<td>7.0%</td>
</tr>
<tr>
<td>1993</td>
<td>1,612,639</td>
<td>401,358</td>
<td>29,006,070</td>
<td>6.9%</td>
</tr>
<tr>
<td>1994</td>
<td>1,630,726</td>
<td>407,413</td>
<td>29,445,282</td>
<td>6.9%</td>
</tr>
<tr>
<td>1995</td>
<td>1,648,294</td>
<td>413,780</td>
<td>29,892,316</td>
<td>6.9%</td>
</tr>
<tr>
<td>1996</td>
<td>1,665,345</td>
<td>420,225</td>
<td>30,338,367</td>
<td>6.9%</td>
</tr>
<tr>
<td>1997</td>
<td>1,681,104</td>
<td>426,477</td>
<td>30,773,981</td>
<td>6.8%</td>
</tr>
<tr>
<td>1998</td>
<td>1,695,367</td>
<td>432,563</td>
<td>31,198,456</td>
<td>6.8%</td>
</tr>
<tr>
<td>1999</td>
<td>1,706,891</td>
<td>437,976</td>
<td>31,588,436</td>
<td>6.8%</td>
</tr>
<tr>
<td>2000</td>
<td>1,716,100</td>
<td>443,010</td>
<td>31,961,787</td>
<td>6.8%</td>
</tr>
<tr>
<td>2001</td>
<td>1,724,472</td>
<td>448,252</td>
<td>32,324,508</td>
<td>6.7%</td>
</tr>
<tr>
<td>2002</td>
<td>1,734,582</td>
<td>455,529</td>
<td>32,996,147</td>
<td>6.6%</td>
</tr>
<tr>
<td>2003</td>
<td>1,745,690</td>
<td>463,057</td>
<td>33,701,837</td>
<td>6.6%</td>
</tr>
<tr>
<td>2004</td>
<td>1,756,053</td>
<td>468,854</td>
<td>34,311,863</td>
<td>6.5%</td>
</tr>
<tr>
<td>2005</td>
<td>1,767,124</td>
<td>475,169</td>
<td>35,029,779</td>
<td>6.4%</td>
</tr>
<tr>
<td>2006</td>
<td>1,777,139</td>
<td>481,599</td>
<td>35,611,758</td>
<td>6.3%</td>
</tr>
<tr>
<td>2007</td>
<td>1,789,102</td>
<td>491,297</td>
<td>36,326,756</td>
<td>6.3%</td>
</tr>
<tr>
<td>2008</td>
<td>1,798,919</td>
<td>500,006</td>
<td>36,911,054</td>
<td>6.2%</td>
</tr>
<tr>
<td>2009</td>
<td>1,803,560</td>
<td>505,345</td>
<td>37,198,908</td>
<td>6.2%</td>
</tr>
<tr>
<td>2010</td>
<td>1,802,573</td>
<td>508,307</td>
<td>37,352,340</td>
<td>6.2%</td>
</tr>
<tr>
<td>2011</td>
<td>1,799,876</td>
<td>510,305</td>
<td>37,483,204</td>
<td>6.2%</td>
</tr>
<tr>
<td>2012</td>
<td>1,791,677</td>
<td>509,824</td>
<td>37,501,510</td>
<td>6.1%</td>
</tr>
<tr>
<td>2013</td>
<td>1,780,653</td>
<td>507,282</td>
<td>37,370,637</td>
<td>6.1%</td>
</tr>
<tr>
<td>2014</td>
<td>1,771,742</td>
<td>505,633</td>
<td>37,259,529</td>
<td>6.1%</td>
</tr>
<tr>
<td>2015</td>
<td>1,765,572</td>
<td>505,253</td>
<td>37,213,754</td>
<td>6.1%</td>
</tr>
<tr>
<td>2016</td>
<td>1,764,085</td>
<td>506,298</td>
<td>37,242,125</td>
<td>6.1%</td>
</tr>
<tr>
<td>2017</td>
<td>1,764,019</td>
<td>508,302</td>
<td>37,313,732</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

**TABLE A4: POPULATION IN BASQUE COUNTRY AND NAVARRE, 1984-2017**

Notes: This table reports adult population (+20) in Basque Country, Navarre and Spain as a whole over the period 1984-2017. These series are part of the Population Census constructed by the Spanish National Statistics Institute (INE). Population numbers are reported as of July of the corresponding year. The last column shows the population of Basque Country and Navarre as a share of total population in Spain.
## GDP IN BASQUE COUNTRY AND NAVARRE, 1984-2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Basque C. (€)</th>
<th>Navarre (€)</th>
<th>Spain (€)</th>
<th>Share of Basque C. and Navarre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>10,711,713</td>
<td>2,548,105</td>
<td>159,107,276</td>
<td>8.3%</td>
</tr>
<tr>
<td>1985</td>
<td>11,889,708</td>
<td>2,784,453</td>
<td>185,562,266</td>
<td>7.9%</td>
</tr>
<tr>
<td>1986</td>
<td>13,416,706</td>
<td>3,174,468</td>
<td>207,859,033</td>
<td>8.0%</td>
</tr>
<tr>
<td>1987</td>
<td>14,320,808</td>
<td>3,700,167</td>
<td>230,913,179</td>
<td>7.8%</td>
</tr>
<tr>
<td>1988</td>
<td>15,573,600</td>
<td>3,996,202</td>
<td>256,013,669</td>
<td>7.6%</td>
</tr>
<tr>
<td>1989</td>
<td>17,622,997</td>
<td>4,652,669</td>
<td>287,944,680</td>
<td>7.7%</td>
</tr>
<tr>
<td>1990</td>
<td>21,008,180</td>
<td>5,460,622</td>
<td>354,233,905</td>
<td>7.5%</td>
</tr>
<tr>
<td>1991</td>
<td>22,191,176</td>
<td>5,842,006</td>
<td>382,992,000</td>
<td>7.3%</td>
</tr>
<tr>
<td>1992</td>
<td>22,802,495</td>
<td>5,930,733</td>
<td>395,249,891</td>
<td>7.3%</td>
</tr>
<tr>
<td>1993</td>
<td>24,133,280</td>
<td>6,301,245</td>
<td>423,161,918</td>
<td>7.2%</td>
</tr>
<tr>
<td>1994</td>
<td>28,171,465</td>
<td>7,606,052</td>
<td>459,337,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>1995</td>
<td>29,564,913</td>
<td>8,145,548</td>
<td>487,992,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>1996</td>
<td>31,495,610</td>
<td>8,756,985</td>
<td>518,049,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>1997</td>
<td>34,032,038</td>
<td>9,316,810</td>
<td>554,042,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>1998</td>
<td>36,801,733</td>
<td>9,976,810</td>
<td>594,316,000</td>
<td>7.9%</td>
</tr>
<tr>
<td>2000</td>
<td>40,711,377</td>
<td>11,157,493</td>
<td>646,250,000</td>
<td>8.0%</td>
</tr>
<tr>
<td>2001</td>
<td>43,591,343</td>
<td>11,906,276</td>
<td>699,528,000</td>
<td>7.9%</td>
</tr>
<tr>
<td>2002</td>
<td>46,167,184</td>
<td>12,741,253</td>
<td>749,288,000</td>
<td>7.9%</td>
</tr>
<tr>
<td>2003</td>
<td>48,879,847</td>
<td>13,586,433</td>
<td>803,472,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>2004</td>
<td>52,130,831</td>
<td>14,514,312</td>
<td>861,420,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2005</td>
<td>56,211,666</td>
<td>15,635,137</td>
<td>930,566,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2006</td>
<td>60,937,706</td>
<td>16,816,112</td>
<td>1,007,974,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2007</td>
<td>65,091,957</td>
<td>17,958,589</td>
<td>1,080,807,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2008</td>
<td>67,698,141</td>
<td>18,738,715</td>
<td>1,116,225,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2009</td>
<td>64,935,346</td>
<td>18,204,976</td>
<td>1,079,052,000</td>
<td>7.7%</td>
</tr>
<tr>
<td>2010</td>
<td>65,680,491</td>
<td>18,256,818</td>
<td>1,080,935,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>2011</td>
<td>65,176,367</td>
<td>18,220,597</td>
<td>1,070,449,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>2012</td>
<td>63,818,464</td>
<td>17,573,037</td>
<td>1,039,815,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>2013</td>
<td>62,647,749</td>
<td>17,480,886</td>
<td>1,025,693,000</td>
<td>7.8%</td>
</tr>
<tr>
<td>2014</td>
<td>63,895,891</td>
<td>17,836,047</td>
<td>1,037,820,000</td>
<td>7.9%</td>
</tr>
<tr>
<td>2015</td>
<td>66,482,288</td>
<td>18,564,204</td>
<td>1,079,998,000</td>
<td>7.9%</td>
</tr>
<tr>
<td>2016</td>
<td>68,817,210</td>
<td>19,152,416</td>
<td>1,118,522,000</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

**TABLE A5: GDP IN BASQUE COUNTRY AND NAVARRE, 1984-2016**

Notes: This table reports GDP in Basque Country, Navarre and Spain as a whole over the period 1984-2016. These series are part of the National Accounts (ESA 2010, 1995 and 1986) constructed by the Spanish National Statistics Institute (INE). Values are reported in thousands of current euros. The last column shows the GDP of Basque Country and Navarre as a share of total GDP in Spain.
### PERSONAL INCOME TAX FILERS, 1999-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Filers</th>
<th>Total adult population</th>
<th>Share of filers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>18,521,709</td>
<td>29,443,569</td>
<td>62.9%</td>
</tr>
<tr>
<td>2000</td>
<td>19,246,192</td>
<td>29,802,677</td>
<td>64.6%</td>
</tr>
<tr>
<td>2001</td>
<td>19,757,147</td>
<td>30,151,784</td>
<td>65.5%</td>
</tr>
<tr>
<td>2002</td>
<td>19,914,191</td>
<td>30,806,036</td>
<td>64.6%</td>
</tr>
<tr>
<td>2003</td>
<td>20,371,413</td>
<td>31,493,090</td>
<td>64.7%</td>
</tr>
<tr>
<td>2004</td>
<td>20,853,041</td>
<td>32,086,956</td>
<td>65.0%</td>
</tr>
<tr>
<td>2005</td>
<td>21,364,900</td>
<td>32,787,486</td>
<td>65.2%</td>
</tr>
<tr>
<td>2006</td>
<td>21,949,869</td>
<td>33,353,020</td>
<td>65.8%</td>
</tr>
<tr>
<td>2007</td>
<td>22,659,298</td>
<td>34,046,357</td>
<td>66.6%</td>
</tr>
<tr>
<td>2008</td>
<td>23,231,888</td>
<td>34,612,129</td>
<td>67.1%</td>
</tr>
<tr>
<td>2009</td>
<td>23,099,973</td>
<td>34,890,003</td>
<td>66.2%</td>
</tr>
<tr>
<td>2010</td>
<td>22,921,340</td>
<td>35,041,460</td>
<td>65.4%</td>
</tr>
<tr>
<td>2011</td>
<td>23,067,189</td>
<td>35,173,023</td>
<td>65.6%</td>
</tr>
<tr>
<td>2012</td>
<td>22,946,558</td>
<td>35,200,009</td>
<td>65.2%</td>
</tr>
<tr>
<td>2013</td>
<td>22,735,378</td>
<td>35,082,702</td>
<td>64.8%</td>
</tr>
<tr>
<td>2014</td>
<td>22,835,510</td>
<td>34,982,154</td>
<td>65.3%</td>
</tr>
<tr>
<td>2015</td>
<td>22,882,152</td>
<td>34,942,929</td>
<td>65.5%</td>
</tr>
</tbody>
</table>

**TABLE A6: PERSONAL INCOME TAX FILERS, 1999-2015**

Notes: This table reports the number of total personal income tax filers (adults +20) in Spain over the period 1999-2015. These series are constructed using personal income tax samples elaborated by the Spanish Institute of Fiscal Studies in collaboration with the Spanish Tax Agency. They exclude the regions of Basque Country and Navarre since they do not belong to the Common Fiscal Regime. Married couples filing jointly are split into two. The last column corresponds to the share of adult filers out of the total adult population (excluding Basque Country and Navarre). The series of total adult population excluding Basque Country and Navarre has been elaborated using the Population Census from the Spanish National Statistics Institute (INE).
### TABLE A7: HOUSING WEALTH IN BASQUE COUNTRY AND NAVARRE, 1991-2003

<table>
<thead>
<tr>
<th>Year</th>
<th>Basque C.</th>
<th>Navarre</th>
<th>Spain</th>
<th>Share of Basque C. and Navarre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>80,254€</td>
<td>15,326€</td>
<td>1,434,772€</td>
<td>6.7%</td>
</tr>
<tr>
<td>1992</td>
<td>89,112€</td>
<td>17,891€</td>
<td>1,494,667€</td>
<td>7.2%</td>
</tr>
<tr>
<td>1993</td>
<td>91,363€</td>
<td>19,387€</td>
<td>1,495,370€</td>
<td>7.4%</td>
</tr>
<tr>
<td>1994</td>
<td>86,893€</td>
<td>17,954€</td>
<td>1,485,696€</td>
<td>7.1%</td>
</tr>
<tr>
<td>1995</td>
<td>96,844€</td>
<td>19,560€</td>
<td>1,552,800€</td>
<td>7.5%</td>
</tr>
<tr>
<td>1996</td>
<td>99,357€</td>
<td>20,096€</td>
<td>1,590,087€</td>
<td>7.5%</td>
</tr>
<tr>
<td>1997</td>
<td>103,350€</td>
<td>21,925€</td>
<td>1,624,967€</td>
<td>7.7%</td>
</tr>
<tr>
<td>1998</td>
<td>108,096€</td>
<td>25,188€</td>
<td>1,704,580€</td>
<td>7.8%</td>
</tr>
<tr>
<td>1999</td>
<td>120,912€</td>
<td>28,795€</td>
<td>1,936,482€</td>
<td>7.7%</td>
</tr>
<tr>
<td>2000</td>
<td>146,528€</td>
<td>33,025€</td>
<td>2,254,074€</td>
<td>8.0%</td>
</tr>
<tr>
<td>2001</td>
<td>183,971€</td>
<td>39,081€</td>
<td>2,637,006€</td>
<td>8.5%</td>
</tr>
<tr>
<td>2002</td>
<td>206,595€</td>
<td>47,051€</td>
<td>3,130,569€</td>
<td>8.1%</td>
</tr>
<tr>
<td>2003</td>
<td>233,529€</td>
<td>53,448€</td>
<td>3,715,702€</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

Notes: This table reports housing wealth in Basque Country, Navarre and Spain as a whole over the period 1991-2003. These series are included in Caixa Catalunya (2004) and were elaborated with data from the Ministry of Public Works. Values are reported in million of current euros. The last column shows the housing wealth of Basque Country and Navarre as a share of total housing wealth in Spain.

### TABLE A8: HOME-OWNERSHIP RATIOS (PRIMARY RESIDENCES) IN SPAIN, 1970-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Owner-occupied housing</th>
<th>Tenant-occupied housing</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>63.4%</td>
<td>30.1%</td>
<td>6.5%</td>
</tr>
<tr>
<td>1981</td>
<td>73.1%</td>
<td>20.8%</td>
<td>6.1%</td>
</tr>
<tr>
<td>1991</td>
<td>78.3%</td>
<td>15.2%</td>
<td>6.5%</td>
</tr>
<tr>
<td>2001</td>
<td>82.2%</td>
<td>11.4%</td>
<td>6.5%</td>
</tr>
<tr>
<td>2011</td>
<td>78.9%</td>
<td>13.5%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

Notes: This table reports the home-ownership ratios for primary residences in Spain over the period 1970-2011. These data come from the housing statistics collected by the Bank of Spain (Indicadores del Mercado de la Vivienda). They build the home-ownership ratio using the Census of dwellings of the Spanish Statistics Institute (INE), which is elaborated on a decennial basis. The category "other" mainly refers to dwellings whose owner has transferred the use to another person.
## IMPUTED NET HOUSEHOLD WEALTH, 1984-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Primary residence</th>
<th>Investment funds</th>
<th>Pension funds</th>
<th>Life insurance</th>
<th>Total imputed wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>1985</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.7%</td>
<td>0.7%</td>
</tr>
<tr>
<td>1986</td>
<td>0.2%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>1987</td>
<td>0.3%</td>
<td>0.5%</td>
<td>0.5%</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>1988</td>
<td>0.3%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>1.7%</td>
<td>1.7%</td>
</tr>
<tr>
<td>1989</td>
<td>0.4%</td>
<td>0.9%</td>
<td>0.8%</td>
<td>2.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>1990</td>
<td>0.4%</td>
<td>1.1%</td>
<td>0.9%</td>
<td>2.4%</td>
<td>2.4%</td>
</tr>
<tr>
<td>1991</td>
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**TABLE A9: IMPUTED NET HOUSEHOLD WEALTH, 1984-2015**

Notes: This table reports the share of assets out of total net household wealth that are not subject to the personal income tax and thus need to be imputed using survey data over the period 1984-2015. The most important asset is primary residence, which accounts for around 30-40% of total net household wealth. Imputed rents on primary residence were subject to the personal income tax before 1999, so that one needs to impute primary residence only after 1999. This table has been elaborated using the Financial Accounts from the Bank of Spain and the series of housing wealth of Artola Blanco et al. (2019).
### COMPARISON OF WEALTH AGGREGATES IN SPAIN, 2005

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<th>SHF</th>
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<td>Net personal wealth</td>
<td>4,877 €</td>
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<td>Net non-financial assets</td>
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<td>Financial assets</td>
<td>1,353 €</td>
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**TABLE A10: COMPARISON OF WEALTH AGGREGATES IN SPAIN, 2005**

Notes: This table compares the wealth totals used for the capitalization technique with the ones used in Alvaredo and Saez (2009) and the SHF. The wealth totals of the capitalization technique are very similar to the ones used in Alvaredo and Saez (2009), but much larger than the ones of the SHF. This difference is mainly due to financial assets. Values are reported in current billion euros.
Notes: The panel (a) figure depicts total unreported financial offshore assets (investment funds, stocks, deposits and life (and other) insurance) held by Spanish residents in tax havens as a share of total household financial assets. This is the series used in order to correct the wealth distribution series for unreported offshore assets. The series comes from Artola Blanco et al. (2019) and has been estimated using Zucman (2013, 2014), whose data mainly come from the Swiss National Bank (SNB) statistics, and the unique information provided by the 720 tax-form. Since 2012, Spanish residents holding more than 50,000 euros abroad are obliged to file this form specifying the type of asset (stocks, investment funds, deposits, etc.), value, and country of location. The panel (b) figure displays the composition of unreported offshore assets in Spain using the information provided in the 2012 720 tax-form. For a more detailed explanation of how the series of unreported offshore assets are constructed, read Artola Blanco et al. (2019) appendix.