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Abstract

This paper estimates the contribution of intergenerational transfers (inheritances and gifts) and socioeconomic background to wealth inequality in four OECD countries: France, Spain, Great Britain and the United States. We generate a non-parametric counterfactual distribution where all differences in wealth associated with the intergenerational transfers received and the socioeconomic background have been removed. Despite the diversity of the four countries analysed, we find similar patterns in the results. The combined contribution of intergenerational transfers and socioeconomic background to wealth inequality is sizeable in all four countries studied, ranging from 37% in Great Britain to 48% in the US. When interactions between the two factors are controlled for, the net contribution of inheritances and gifts is between 23% and 30%, while the net contribution of family background lies between 4% and 11%. These values are substantial and reveal that the importance of intergenerational transfers in all these countries is at least twice that of socioeconomic background.

JEL classification: D31, D63, I24
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1. Introduction

In the current context of high and often increasing wealth inequality (Davies et al., 2017; Saez and Zucman, 2016), finding the main factors that contribute to this inequality has become central. Here we explore two a priori important candidates as contributing factors, namely intergenerational transfers (inheritances and gifts) and socioeconomic background.

Intergenerational transfers have been found in some recent studies to equalize overall inequality of wealth. Using tax records for Denmark, Boserup et al., (2016) find that bequests receipts reduce the wealth share of the top 10%, while Elinder et al., (2018) find for Sweden that inheritances produce a small decrease in relative inequality, even if absolute dispersion increases and if the equalising effect has been found not to last long (Nekoei and Seim, 2019). Using survey data and lifetime intergenerational transfers receipt, Crawford and Hood (2016) and Karagiannaki (2017) also find an equalising effect of transfers in Britain and England by comparing with the wealth distribution excluding transfers.

The key common element of the studies arriving to this conclusion is that inheritances produce a decline in wealth inequality as long as the distribution of bequests is more compressed than the distribution of wealth. However, we believe that an alternative more comprehensive way to understand the contribution of transfers to wealth inequality is to consider not only the change in recipients' wealth before and after the receipt of transfers, but also the link between transfers and the position achieved in the wealth distribution.[2]

Thus, our approach captures the impact of inheritances and gifts on inequality by comparing with a counterfactual in which transfers do not influence the position of individuals in the wealth distribution. Importantly, here the effect is not driven solely by the changes in wealth for receivers, and the methodology considers the connection between receiving no transfer and the place in the wealth distribution.

Besides intergenerational transfers, the other obvious candidate as a contributor to wealth inequality is socioeconomic background. This has been shown to be one key factor explaining inequality in terms of income (Hufe et al., 2017; Lerman, 1996) and studying it in the context of wealth is important not only because of its potential independent influence

[2] Although not measuring inequality, studies that measure intra and intergenerational mobility have found the importance of transfers to be significant. Fessler and Schürz (2018) show that having received an inheritance at any point in the past lifts a household an average of 14 percentiles in the wealth distribution while Adermon et al., (2018) find that at least half of the parent-child wealth correlation is explained by bequests and gifts.

on the distribution, but also because it is likely to be correlated with intergenerational transfers. In that case, estimates of the contribution of intergenerational transfers to wealth inequality could also reflect the effect of family background and vice versa. Fortunately, our approach and data sources will allow us to net out the effect of these two coexisting factors.

In essence, our method groups households into different categories or 'types' according to the intergenerational transfers received -including non-recipients as a separate 'type'- and their family background. The distribution of wealth will be independent of the factors under consideration if the wealth distribution is the same across types, that is, if households from different types but at the same rank of their respective type distributions have the same wealth. If that is not the case, intergenerational transfers received and socioeconomic background do have an influence on the final distribution of wealth and, therefore, on the observed level of wealth inequality. Exploiting this idea, we can construct a counterfactual wealth distribution that assigns the same level of wealth to all households in the same rank across types. By comparing that counterfactual distribution of wealth with the observed one, we can then measure the share of total wealth inequality that is associated with differences in each of these two factors.[3]

To use this approach to measure the contribution of intergenerational transfers and family background to wealth inequality, we have to address two issues. First, we must isolate from our analysis the influence of demographic factors like age, gender and the composition of the household. Bover (2010) and Salas-Rojo and Rodríguez (2019) have shown that a considerable part of the differences in wealth inequality between countries can be explained by those factors. To adjust for the effect of household size we use an equivalence scale, and to adjust for age and gender we regress household wealth on age, gender and their cross effects to obtain an age-gender adjusted wealth distribution. Second, we need to calculate the counterfactual wealth distribution. For this, we employ the expected wealth conditional to the quantile that the household occupies in its type distribution. The contribution of intergenerational transfers and socioeconomic background to the final distribution of wealth would be null if observed wealth coincides with the counterfactual wealth value for all households. In principle, the counterfactual wealth distribution can be approximated either by parametric or non-parametric estimation. In distributions where values and quantiles do

[3] A similar strategy is followed by the literature on inequality of opportunity where total population is usually partition into types according to a set of circumstances (factors out of the individual's responsibility). See Roemer (1998), Fleurbaey (2008) and Roemer and Trannoy (2016).

not follow a specific functional form, like wealth, the non-parametric approach is preferred. Among the existing non-parametric methods, we adopt the Nadaraya-Watson estimator, which besides being one of the most commonly used smoothers, is also asymptotically bistochastic (Lasso de la Vega et al., 2019). This last property guarantees that our measure is positive if there is any contribution to wealth inequality.

Our empirical exercise takes advantage of a set of household surveys that gather information about wealth, inheritances, gifts and family background for recent years: The Survey of Consumer Finances (SCF) for the US, the Wealth and Assets Survey (WAS) for Britain and the Household Finance and Consumption Survey (HFCS) for France and Spain. The four economies under consideration are rich OECD members but have significant differences in their taxation of wealth and intergenerational transfers, which helps us to obtain results that are robust to the national fiscal system. The US and UK do not tax wealth directly, whereas France and Spain are among the very few countries still having a tax on wealth (OECD, 2018).4 As for inheritance and gift taxation, Spain has a progressive tax with a maximum rate of 34%, but with different regional exemptions and reductions that have in practice eliminated the tax in some geographical areas. In France, the inheritance tax is progressive with a minimum rate of 5% and a maximum tax rate of 45% (60% beyond the 4th degree of relationship), with different gift allowances of up to 160,000 euros depending on the relationship involved. Great Britain has a flat inheritance rate of 40% with an allowance of £325,000 and an additional allowance for transfer of the family home. Gifts transferred seven years prior to the death of the donor are exempt. In the US, inheritance tax has a 40% maximum rate with a recently raised exclusion amount (free of tax allowance) of $11.4 million (around $5 million until 2017).[5]

Our results show that intergenerational transfers contribute up to 39% of total wealth inequality (according to the mean logarithmic deviation, MLD) in France and Spain, 37% in the US and 33% in Britain. These values are still substantial when the interaction with family background is controlled for: 30% for France, 26% for the US, 24% for Spain, and 23% for Britain. Receiving a large transfer (an amount in the top quartile of the transfer distribution) significantly increases the probability of being among the wealthiest. The chances of being among the wealthiest are clearly reduced for those receiving none or a small transfer,

[4] The wealth tax represents around 0.5% of government revenue in both countries.

[5] For simplicity, throughout the paper we use the term transfers referring to all intergenerational transfers, including gifts during lifetime.

exposing a high level of inequality of opportunities in wealth associated with transfers. Similarly, and although the independent influence of family background is clearly smaller than that of transfers (between 4% and 11%), having parents who are managers or higher professionals (France, Spain), or have tertiary education (the US, Britain) provides a great advantage to their children. The salience of these results is supported by the fact that these underlined top inheritance and social background 'types' dominate, according to first-order stochastic dominance, the other types.

Considering the net effect of both inheritance and social background plus their joint interaction, the contribution to wealth inequality amounts to 48% for the US, 46% for Spain, 44% for France, and 36% for Britain. In other words, removing the differences in wealth associated with transfer receipt and parental background would account for nearly half of wealth inequality in some countries and for more than one third in all of them.

Given the current context of a widespread increase in wealth inequality, our results can help to reflect on the fiscal treatment of wealth and transfers. Wealth transfer taxes are in force in many OECD countries but have recently been abolished in some countries and their role in tax systems is becoming marginal (Drometer et al., 2018). Wealth tax is only still present in a handful of countries, but the debate on wealth tax has gained momentum in recent years with conflicting currents in favour of incorporating it to Britain and US tax mix, but of reducing its role in Spain and France. It is worth noting that wealth taxation can have more than normative implications about justice. For example, existing empirical evidence indicates that inequality of wealth and inequality of opportunities are harmful for economic growth (Marrero and Rodríguez, 2012 and 2013; Bagchi and Svejnar, 2015; Bradbury and Triest, 2017). Hence, the design of a fiscal system that treats wealth accumulation and transfers properly is not only a matter of fairness, but also of efficiency.

The rest of the paper is structured as follows. In Section 2 we present the non-parametric method that we use to estimate the impact of transfers and socioeconomic background on wealth inequality. Section 3 describes the four databases being employed and the main choices and adjustments made with respect to the variables for the study. The main results are presented in Section 4. Finally, Section 5 concludes.

2. Estimation approach

To estimate the importance of transfers and socioeconomic background in wealth inequality, we adopt a strategy based on the recent literature on measurement of inequality of opportunity (Roemer, 1998; Fleurbaey, 2008; Roemer and Trannoy, 2016). Such a framework considers that individual outcomes (in our case, wealth) are a function of factors beyond individual's responsibility –circumstances (in our case, intergenerational transfers and socioeconomic background) – and personal efforts.[6] Because individuals are only responsible for their own efforts, equality of opportunity requires outcomes to be a function only of individual efforts and, therefore, independent of individual circumstances. Following Roemer (1998), Rodríguez (2008) and Checchi and Peragine (2010), we adopt an ex-post approach to estimate the amount of wealth inequality due to differences in transfers and/or socioeconomic background. According to this approach, there is equality of opportunity if all individuals who exert the same effort obtain the same outcome. However, since the distribution of effort is not observed, we adopt Roemer's pragmatic proposal. According to this approach, two individuals of different types have tried equally hard (have exerted the same degree of effort) if and only if they are on the same tranche (rank) of their respective type distributions.

The first step of this approach consists in partitioning the population into a set of mutually exclusive and exhaustive groups (types), where all individuals in a given type share the same set of circumstances (type distribution). Then, after ordering the households within each type by their wealth, we compare the households within the same tranche across types. If the circumstances under analysis (transfers and family background) are irrelevant for the distribution of wealth, households with different circumstances but in the same tranche should have the same wealth. Otherwise, the circumstances under consideration have an influence on the distribution of wealth and, consequently, on wealth inequality. In fact, the greater the dispersion of wealth within tranches, the higher the importance of transfers and family background in determining wealth inequality.

To measure such dispersion within tranches, we consider the expected wealth conditional to the tranche of the household as our counterfactual wealth distribution. In this counterfactual, households belonging to different types but having the same tranche have the same expected

[6] This framework has grounding in the political philosophy of Rawls (1971), Sen (1980) and Dworkin (1981) about fairness. The association of inequality with factors beyond the individual's control aims to capture the share of 'unfair' inequality or 'inequality of opportunity'.

wealth. As a result, transfers and socioeconomic background will be relevant if observed household wealth distribution differs from the counterfactual. Let us express this in formal terms.

For a population of households of size N, a wealth distribution is represented by a vector $Y = (Y_1, Y_2, \dots, Y_N)$ where Y_i is the wealth of the i-th household. Let $Z_i = E[Y_i|q_i]$ be the expected wealth of household i conditional to the tranche (quantile) q_i that it occupies in its type distribution −in vector notation $Z = (Z_1, Z_2, \dots, Z_N)$. The contribution of circumstances to the explanation of the observed distribution of wealth is zero if $Y_i = Z_i$ for all $i = 1, 2, \dots, N$. Thus, the ex-post approach consists in measuring the distance between the distribution of Y and the distribution of Z. The higher this distance, the more important would be the circumstances (transfers and family background) in explaining wealth inequality.

But, how to proxy the distribution Z? In principle, the vector Z can be approximated either by a parametric or non-parametric approach. Because the non-parametric procedure is not restricted by the assumption of a particular functional form, we consider the non-parametric approach more realistic for our analysis. Therefore, we proxy the vector Z by the following non-parametric smoother:

$$\hat{Z}(q) = \sum_{i=1}^{N} W_i(q) Y_i, \tag{1}$$

where $W_i(q)$ represents the set of weights, which are nonnegative, sum one and downwardly weight the Y_i's if the corresponding quantile q_i value is far from q. Among the proposals in the literature, we follow Lasso de la Vega et al. (2019) and use the classic Nadaraya–Watson estimator (Nadaraya 1964; Watson 1964).[7] The Nadaraya–Watson weights are as follows:

$$W_i^{NW}(q) = \frac{K_h(q - q_i)}{\sum_{i=1}^{N} K_h(q - q_i)}, \tag{2}$$

where K_h is a continuous, positive and symmetric kernel function which integrates to one, like the Gaussian function. The shape of the kernel weights is determined by K, whereas the size of the weights is parameterized by the bandwidth h.[8] Thus, the bandwidth determines

[7] Other non-parametric smoothers could be used. However, the Priestley and Chao (1972) and Gasser and Muller (1984) smoothers have more severe boundary bias problems than does the Nadaraya–Watson smoother (Wand and Jones, 1995). The local linear smoother, on the other hand, optimizes the minimax risk criterion (Fan, 1993) but uses negative weights which, in our case, are difficult to interpret.

[8] The kernel function with scale factor $h > 0$ is defined as $K_h(s) = \frac{1}{h} K\left(\frac{s}{h}\right)$, which has support [-$h$, h]. For consistency, the smoothing parameter $h \to 0$ and $nh \to \infty$ as the sample size $n \to \infty$ (see Wand and Jones 1995). To account for sampling weights, we have used in the empirical application the 'npksum' function in the R 'np' package (Hayfield and Racine, 2008). We are grateful for technical advice to Jean Opsomer and, in particular, to Luc Clair and Jeffrey Racine for their valuable help.

which households are considered in the same comparable tranche to obtain the benchmark value at each point. This parameter h is chosen to minimize a distance measure, such as the Mean Integrated Squared Error (MISE).

The formation of tranches is a relevant aspect of our approach. Researchers typically consider a discretional fixed and exclusive tranche to compare households, such as the percentile or the decile (Rodríguez 2008; Checchi and Peragine 2010). However, this approach has three shortcomings. First, it implicitly assumes that the dispersion of outcomes among households belonging to the same type and tranche is normatively irrelevant and, therefore, the potential information (dispersion) that it contains is ignored. Second, the exclusivity of the intervals (non-overlapping) means that close equals that are in different tranches are considered to be different for the estimation, despite the fact that they may be closer in terms of rank than observations in the same tranche. Third, the crucial decision about the size of the tranches is left to the discretion of the researcher. Our approach tackles these three problems. First, the dispersion of wealth among households belonging to the same type and tranche is considered normatively relevant and provides information for the estimates: more distant observations are weighted less than closer ones. Second, the use of overlapping intervals avoids artificial discontinuities in the classification of close equals. Third, the application of a statistical criterion like the MISE permits to optimize the width of the tranche, which seems to be better than the ad hoc subjective researcher's criterion.

An additional important property of our methodology is that the Nadaraya–Watson estimator is asymptotically bistochastic Lasso de la Vega et al. (2019). This property implies that, for sufficiently large samples, the Lorenz curve of $\hat{Z}$ will always dominate (or at least be equal to) the Lorenz curve of Y (Dasgupta et al. (1973); Rodríguez et al. (2005). Consequently, for any inequality index $I(\cdot)$ consistent with the Lorenz curve, the use of the Nadaraya–Watson estimator guarantees that the estimated dispersion between the observed distribution Y and the counterfactual distribution $\hat{Z}$ is non-negative, $I(Y) - I(\hat{Z}) \geq 0$, as long as inheritances and family background contribute to wealth inequality.

The final step of the approach consists in selecting an inequality index to measure the dispersion between Y and $\hat{Z}$. Among all the inequality indices consistent with the Lorenz curve, we propose the use of the Mean Log Deviation (MLD). In the literature on wealth inequality, the use of other measures is more popular, however, the MLD presents two main advantages for our analysis. First, the MLD is the only inequality index that is additively decomposable into a between-group and a within-group component (Bourguignon, 1979;

Shorrocks, 1980) and has a path-independent decomposition (Foster and Shneyerov, 2000). Second, it is the only measure that respects both the principle of transfers -the cornerstone of the literature on inequality measurement- and the principle of monotonicity in distance (Cowell and Flachaire, 2018).[9]

Taking advantage of the first property of the MLD and grouping households into tranches according to their position in their type, the MLD index (T) can be exactly decomposed into a between (BE) and a within (WI) groups (tranches) inequality components as follows:

$$T(Y) = T^{BE}(Y) + T^{WI}(Y). \tag{3}$$

The between-tranches component, $T^{BE}(Y) = T_0(\hat{Z})$, is calculated by applying the MLD to the non-parametric smoothed distribution $\hat{Z}$, which is free of the influence of circumstances. Recall that the idea is to compare observed wealth with the (non-parametric) smoothed value of wealth (the counterfactual) at the same tranche.

The second term, $T^{WI}(Y) = T_0(Y) - T_0(\hat{Z})$, captures the extent of wealth inequality within each tranche. This component is the part of total wealth inequality that is explained by transfers and family background. Thus, when $T^{WI}(Y) = 0$ transfers and family background are irrelevant for wealth inequality: households at the same tranche but from different types obtain the same wealth, i.e., $T_0(Y) = T_0(\hat{Z})$. On the other hand, the greater the differences in wealth among households from different types within the same tranche, the greater the extent to which wealth inequality is associated with inheritances and socioeconomic background.

3. Data: wealth, transfers and family background

Data availability has kept the study of wealth inequality one step behind the study of income inequality. Only in recent years, some - mainly administrative - databases have begun to be exploited, revealing unsettling findings about the level of wealth inequality and its trend

[9] Some standard inequality measures like the Gini coefficient and the Theil index can be written as ratios, where the denominator is the mean. As a result, when wealth moves away from equality, both the numerator and denominator can change in the same direction and such inequality measures may decrease (instead of increase) in some cases. This undesirable behaviour is not shared by inequality indices whose denominator is the median, but these other indices do not fulfil the principle of transfers. Only the MLD satisfies both principles, transfers and monotonicity in distance, simultaneously.

(Piketty and Zucman 2014; Saez and Zucman 2016; Goda 2018).[10] Simultaneously, the link between wealth and well-being is being revisited, and some advantages derived from a higher level of wealth -and not only income- are now being explicitly acknowledged.[11] Thus, Hochman and Skopek (2013) show that there is a subjective well-being premium for wealthier individuals, even within rich countries like Germany or Israel. Johnson (2014) highlights the importance that family wealth has in the United States educational system, providing access to better schools located in more expensive neighbourhoods or funding for higher education. There is then a genuine interest in knowing how unevenly wealth is distributed and to what extent that inequality is associated with other factors.

Tax records linking transfers and wealth are scarce but, at the macroeconomic level, the capitalisation of capital income and the application of the mortality multipliers to inheritance tax flows allow to reconstruct the share of inherited wealth for the economy as a whole in an historic perspective (Alvaredo et al., 2017; Piketty et al., 2014) or to attempt to see the impact of transfer in a given cohort (Boserup et al., 2016; Elinder et al., 2018). However, it is important to note that the administrative datasets present some biases caused by tax evasion and the truncation of the wealth distribution at the lower tail since taxpayers in that part of the distribution are not obligated to file a tax return. More importantly in our case, tax records do not usually include information about the socioeconomic background of individuals. Thus, our alternative is to consider household surveys, which, for a selected set of countries and waves, contain information not only about individual wealth and an ample set of demographic variables, but also about socioeconomic background and past wealth transfers received.

Taking advantage of the rich information provided by a selected set of household surveys, we analyse socioeconomic background (parental occupation or education) and transfers as sources of wealth inequality. We measure this influence across four OECD countries (France, Spain, the US and Britain) to test the robustness of the main patterns found here.

3.1 – Wealth information from Household Finance Surveys

We use the latest available wave of the Survey of Consumer Finances (SCF, collected in 2016 and published in late 2017) and Household Finance and Consumption Survey (HFCS,

[10] Global statistics on wealth inequality and on the accumulated share of wealth owned by the top 1% of the world's population (Alvaredo and García-Peñalosa, 2018; Davies, Lluberas, and Shorrocks 2017) have had considerable impact among the general public.

[11] In the classic discussion about the relative or the absolute nature of subjective well-being, scholars have always used income as the proxy for fulfilment of material needs (Veenhoven, 1991; Diener et al., 1993).

Wave 2, which was published in late 2016, but collected the data in 2011/2012 for Spain and 2014/2015 for France), and the third wave of Great Britain's Wealth and Assets Survey (WAS), which collected data in 2010/2012. We have complemented WAS Wave 3 with information from Waves 1 and 2 in order to obtain the total amount of transfers (for reasons explained below). For comparability, all the amounts have been converted to USD dollars at 2016 prices.

The household is the unit of analysis in the SCF and HFCS surveys for wealth and transfers. For the WAS transfers are collected at the individual level and are aggregated here to the household level. The measure of household wealth has been chosen to be homogeneous across the surveys used. Thus, wealth includes all net worth (real and financial assets net of liabilities) and excludes rights of pension wealth in all countries. Survey sampling may not fully capture the upper tail of the wealth distribution, but statistical offices try to minimize the bias by oversampling the wealthier households. In particular, the SCF is considered the gold standard in this respect, and its results in terms of wealth concentration - even at the top 1%- are comparable to those obtained from tax data (Bricker, Henriques, Krimmel and Sabelhaus, 2015). In Europe, the HFCS also incorporates oversampling of the upper part of the distribution in many cases. In fact, Spain and France are the countries with the highest effective oversampling rate of the top 10% households of the wealth distribution (234% and 132%, respectively) in Europe. Great Britain's WAS also applies an oversampling strategy, where addresses from wealthier postcodes are 2.5 or 3 times more likely to be sampled.[12]

Compared with administrative sources, the household wealth surveys used present comparable information, though somewhat lower levels of wealth concentration at the top of the distribution. In France, the wealth share measured through the capitalization methods for the top 10% is about 55% (Garbinti et al., 2018), while our top 10% share is 49.7% (see column 1 in Table 1). For the US, the top 10% of the distribution in our data has 80.5% of the wealth, a comparable share to what Saez and Zucman (2016) obtained using capitalized income tax records. Estimations derived on tax data find a share of wealth for the top 10% in the UK slightly above 50% (Alvaredo et al., 2016 and 2018), while we show, for our WAS sample, a figure of 44.2%. Finally, for Spain, Martínez-Toledano (2017) finds a top 10%

[12] See Bricker et al. (2015) for the SCF, the HFCS Document UDB5 (Country Surveys Metadata Information) and the WAS User Guide for more detailed information on oversampling and other data collection procedures. All descriptive measures and calculations presented here use the corresponding weights for each country dataset.

wealth share of 56.5% in 2013 using administrative datasets, while our sample's top 10% share is 45.1%.

An important issue in the measurement of wealth inequality is the treatment of negative and zero wealth values. The methodology described in Section 2 focuses on the MLD inequality index. The main limitation of using this inequality index is that it only deals with positive values, consequently, we have to transform or exclude non-positive observations from our study. Instead of altering the data by assigning a very small positive value to non-positive observations, we have opted for the clearer option of excluding them from the sample.

The exclusion of non-positive values might raise concerns about the potential bias of wealth inequality estimates, especially if those excluded households received different inheritances and gifts than the rest of the households in the distribution. However, we believe that this is not a major concern in our application for two main reasons. First, the weighted share of observations excluded is very small in France and Spain (2.5% and 3.2%), although higher in Britain (9.1%) and the US (10.4%) (See Table 2a). Second, a detailed exploration of our data reveals that households with zero or negative wealth are much less likely to have received transfers (especially large transfers) than households with positive wealth. The shares of recipients of transfers and, especially, large transfers over the 75th percentile of the inheritance distribution are much lower for households with negative wealth. These are, respectively: 9.0% and 3.0% in France; 7.6% and 0.03% in Spain; 8.7% and 1.3% in Britain; and 5.4% and 0.7% in the US. Households with negative wealth are less likely to have received an inheritance even than the subset of positive wealth households with lower wealth (see Table 2). The possible bias on our estimates caused by the omission of negative wealth households would then be small and would point, in any case, to our estimates of the contribution of transfers to wealth inequality being slight underestimates.

3.2 – Intergenerational transfers and socioeconomic background

The wealth transfers variable we construct includes both inheritances and gifts ever received by the household. Since the respondents provide the year in which the inheritance and gift was received, all values from past inheritances and gifts have been homogenised and updated to the current value of money in each country at the time of the survey, using historical inflation rates.[13] In SCF and HFCS, respondents provide the gross value of inheritances and

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[13] Past inheritances may have provided returns to the household and thus have increased their current value but could also have been consumed overtime. Capitalising and discounting -with some assumptions- could

gifts received, while in WAS it is the net value that is sought. For consistency, we have recovered -prior to inflation updating- the gross value of inheritances and gifts received in the WAS for Britain, using the tax parameters in place at the time of receipt.[14]

The HFCS survey reports the current gross value of the three main inheritances or gifts received, in addition to the main residence whenever this has been inherited. The WAS survey asks for inheritances ever received in the past in its first wave (Wave 1, 2008). However, in subsequent waves, the survey asks for inheritances received in the last two years. Thus, in order to compute the total amount of inheritances for each household, we have used a cross-wave sample of surviving households in Waves 1, 2 and 3, for which we have all the inheritances ever received by these households. In WAS, gifts are reported in a separate question and, unfortunately, the survey only asks about recently received gifts in all its Waves (even Wave 1), so we only have gifts received in the previous six years, which implies a modest underestimation of total intergenerational transfers for Britain (as discussed in detail in Nolan et al., 2020). Another distinctive specificity of the WAS survey is the high number of missing observations -not imputed by the statistical office- especially in Wave 1. Missing inheritance amount observations, in which the respondents have answered that they *had* received such inheritances, have been imputed.[15] In the other surveys (SCF and HFCS) the statistical offices impute the missing values with a multiple imputation method.[16]

Before we classify transfers into categories, a few preliminary things must be considered. First, only inheritances above a minimum value have some economic impact in the household, therefore, the category of households with "no inheritances" are actually households not receiving any inheritance above 5000 US dollars at 2016 prices. Second,

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attempt to address this issue, but to avoid discretionary decisions we have decided to limit the adjustment to updating to the current value of money.

[14] The tax on intergenerational transfers in the UK has been historically very progressive, with a top marginal rate for bequests (estate duty and capital transfer tax) between 75% and 85% in all years between 1949 and 1983. Then, it has decreased gradually until the current flat 40% inheritance tax was established in 1988 (see Scheve and Stasavage, 2012, for a comprehensive review of the evolution of these rates in the UK and other countries).

[15] The missing observations were apparently due to a coding error occurred during the survey field work. Many respondents who answered positively to having received an inheritance do not have the amount of those inheritances registered in the data. The variables used for imputation were age, number of inheritances received, ownership status of main residence and expectation of reception of future inheritance, using the multiple imputation method, the "Predictive Mean Matching" method and the R 'MICE package' (van Buuren, 2007). Five probable multiple sets imputations were obtained, and we used the first of those datasets, checking that the analysis using the other sets of imputations did not alter significantly our results.

[16] For both surveys, we show the results obtained using the first imputation. As with the WAS survey, we have checked that using the other imputations in either survey produces only very minor changes that do not alter our main results. We have not averaged the multiple imputations prior to the analysis, since that would have artificially smoothed our target variables.

because three countries have information about whether the household expects to receive a significant inheritance in the future, Spain being the exception, we have used this information to divide the households that have not received an inheritance into the categories of "not received and not expecting" and "not received but expecting".[17] Three, we have taken the quantiles 0.25, 0.50 and 0.75 of the equivalent inheritance distributions as thresholds (they are described in Table 3). As a result, we have classified transfers into six categories: 'not received and not expecting', 'not received but expecting', 'low inheritance', 'mid-low inheritance', 'mid-high inheritance', and 'high inheritance' for the US, Britain and France, and five categories for Spain, including 'not received', 'low inheritance', 'mid-low inheritance', 'mid-high inheritance', and 'high inheritance'.

To measure socioeconomic background, we use the parental information for the household head. In particular, we employ parental occupational categories for France (based on the French Occupational classification) and Spain (based on the ISCO-08 broad two-digit groups), and parental educational achievement categories for Britain and the US. The distribution of observations per occupational/educational category is shown in Table 2.

In France, we group occupational codes in 4 categories: *i*) manual workers and agriculture; *ii*) employees; *iii*) trade/craft and middle range professionals; and *iv*) manager and high professionals.[18] For Spain, the grouping includes elementary occupations, machine operators and fishery/agriculture in the first group; mid-level professionals, technicians and craftsmen in the second level; administration and sales employees in the third group; and managers and high professionals in the fourth category. In Britain, the information about parental education is provided in terms of the age at which the parent abandoned the school. We have collapsed the existing categories in four groups: *i*) parents who did not go to school; *ii*) parents who left school before or at the age of 16; *iii*) parents who left school at the age of 17 or 18 or who obtained other qualifications after leaving school; *iv*) parents who gained a university or higher degree. In the US, the four educational categories include a first group of households whose head's best educated parent did not finish 12th grade; a second group including those whose parents finished 12th grade (completed secondary education); a third group including further qualifications after leaving high school (some college or associate degree); and a

[17] Great Britain and US datasets include a reported expected amount by the individuals. However, the HFCS only has a dummy variable on whether there is a substantial inheritance expected. We have therefore used this dichotomic distinction, excluding expected inheritances in Britaina and the US under 10.000 USD to account only for "substantial" expected amounts.

[18] Although in the HFCS all countries must report the occupational categories following the ISCO-08 classification, it seems that the French data kept the coding of their original national survey.

fourth category including households with parents that obtained a Bachelor's degree or above.

3.3. The household size, age structure and gender gap

In order to isolate the role of transfers, family background and their interaction in shaping wealth inequality, we need to control by certain demographic factors, such as family size and household head's age and gender, which have been shown to be connected to the distribution of wealth (Bover, 2010; Salas-Rojo and Rodríguez, 2019).

Household size is likely to be correlated with inheritance receipt, since smaller households with a single adult have lower chances of receiving an inheritance than bigger households with more adults. In a more indirect way, household size's connection with social background and the household's head age and gender could also correlate with inheritances and wealth. Households with a female and/or younger head can have a different average size than those with a male and/or older head. To tackle the direct and indirect influence of household size on inheritance and wealth, we equivalize both variables in each country analysed.[19] Unfortunately, using equivalence scales is not enough to account for differences in wealth inequality across countries associated with household structure (Bover, 2010). Indeed, a descriptive analysis of the wealth-age pattern reveals that, even after equivalising, age and gender still have a clear connection with wealth.

The equivalised wealth profile by age and gender for our four countries is shown in Figure A1 (see Appendix). Each point represents the rolling mean wealth at each age, using 9 year centred intervals. In general, for the four countries analysed, we observe a growing trend of mean wealth up to the interval of 60-65 years old. Then, it decreases slightly for the rest of the age range in France, and more significantly in Spain and Britain. The US shows a steadier pattern between the age of 60 and 75, after which we observe a further increase but only for male households. Moreover, although the share of female household heads is similar in all

[19] Our equivalence scale $E = 1 + \sqrt{Number\ of\ adults - 1}$ focuses in the number of adults (members more likely to receive an inheritance), and takes into account that after the second adult (potential spouse), the rest of adult members (adult siblings, uncles, parents, older sons) are less likely to be permanent members of the household. Nevertheless, results do not change significantly if the square root of the number of people in the household is used instead (results are available upon request).

countries -ranging from 35% in France to 43% in the US- female and male head households show different age-wealth profiles in all countries.[20]

The gender wealth gap in rich countries has already been documented in the literature (see, for example, Sierminska, Frick, and Grabka 2010). Here we find that the wealth gap is always favourable to male head households, although the magnitude of this gap varies greatly across countries. In France, the gap starts at the age of 40 and is relatively stable up to 70 years of age, when it decreases slightly. In Spain, the gender gap is small until age 55, but from that age the gap increases very significantly and remains high until 80 years old. In Britain, the profile of the gap is similar to that in Spain, but the age from which the gap rises is 60 years and its subsequent increase is not so high. It is in the US where the greatest gender wealth differences are observed. The increase in the gap begins at 45 years, it keeps growing fast until it reaches 60 years old. Then it remains steady until another sharp increase takes after 75 years of age. Ruel and Hauser (2013) point at the income gap as one of the main sources of ulterior wealth differences through accumulation. This idea is consistent with the increase in the wealth gap with age. The fact that the gender earnings gap has generally been decreasing overtime in developed countries (Olivetti and Petrongolo, 2016) could contribute to the smaller gap found at younger ages.

To avoid the possible confounding effect of age and gender with the variables targeted in our analysis (wealth, inheritances and socioeconomic background), we perform the following adjustment to the equivalised wealth series: we regress household wealth in logarithms on age (centred at age 65), gender and their cross effects,

$$ln\,(W_i) = \alpha + \delta F_i + \sum_{n=1}^{4} \beta_n (A_i - 65)^n + \sum_{n=1}^{4} \gamma_n F_i (A_i - 65)^n + \varepsilon_i, \qquad (4)$$

where F_i is a dummy variable that takes the value 1 when the household head is female and A_i is the age of the household head. Note that this specification permits to control for a wealth-age structure that is non-linear (Solon, 1992; Palomino, Marrero, and Rodríguez, 2018). Likewise, it is widely known that the wealth distribution is much more skewed to the right than income. Given the generally observed accumulation of wealth at the right tail of the distribution we apply the natural logarithmic transformation.

[20] We have considered as household head the household's reference person, which is the person with the highest income (or age in case of equal income) and responsible for the household finances. This is the criteria used in HFCS and WAS. The SCF considers by default the man as the household head, for historical backward consistency. However, it does provide a variable informing whether this role has been reversed for the interview response. Using this variable, we have been able to reassign the role of head when the respondent is a female.

For each country, we obtain estimated OLS coefficients that are highly significant and with the correct sign (see Table A1 in Appendix). First, the female dummy shows a negative estimated coefficient, ranging from -0.244 in Spain to -0.692 in the US. Second, the estimated sequence of parameters for age, β_n where n = 1, 2, 3, 4, shows the positive correlation between wealth and age, specially up to the age range of 60-70 years, depending on the country. The significance of the squared and even cubic terms in some cases (for the US) indicate that the wealth-age structure is non-linear, as highlighted in Figure A1. Finally, the estimated cross-term is positive and significant only for France.

Then, the adjusted wealth by age and gender, W_i^{adj}, is calculated as:

$$ln\,(w_i^{adj}) = ln\,(W_i) - \hat{\delta}F_i - \sum_{n=1}^{4}\hat{\beta}_n(A_i - 65)^n - \sum_{n=1}^{4}\hat{\gamma}_n F_i(A_i - 65)^n, \qquad (5)$$

where the hat indicates the OLS estimations. Now, the adjusted wealth W_i^{adj} represents the wealth of a male household head 65 years old. This within-group adjusted wealth is the wealth measure used from this point onwards.

4. Results

In this section, we show the results for the contributions of transfers and socioeconomic background to wealth inequality. Since socioeconomic background and transfers are expected to be correlated, we consider their interactions to properly measure the role of each factor on wealth inequality.

We first examine the results for transfers and socioeconomic background separately, which provides us with a measure of each factor's *gross* contribution. These contributions include potential interactions with other factors not included in the analysis. Secondly, by computing also the joint contribution of both factors to wealth inequality, we decompose the gross contribution of each factor into its net contribution -independent of the other factor- and the contribution caused by the interaction between both variables.

For intergenerational transfers, graphical representation of the different types (Figure 1) shows a clear connection with wealth. Here transfer types are capturing not only their direct effect on wealth, but also the effect of any other factor correlated with them (except age and gender). The figure shows that households that have received the greatest transfers (in the top quartile of the transfer distribution) dominate in terms of the first stochastic dominance (Rothschild and Stiglitz, 1970) the rest of households at any other type in all four countries analysed.[21] Consequently, the households belonging to this type benefit from the highest level of welfare in society according to any generic welfare function that is additive, symmetric and non-decreasing. The difference between this type and the rest of the types is especially wide in the US, followed by Spain and then in France, while it is not so pronounced in Britain.

The dominance across the rest of transfer categories is not so clear, with their distributions closer to each other in all four countries, except for France where the households with mid-high transfers have a wider gap over the lower amount of transfers at all tranches of the distribution. Households with no transfer are usually at the bottom of the wealth level at the lower tranches, although the distributions cross with the low or mid-low transfer types at the highest tranches in Spain and France, and especially in the US, where the top quartile of the households receiving no transfer (and not expecting to receive) may have higher wealth than the top quartile of households receiving low or mid-low transfer.

To measure the gross contribution of transfers on wealth inequality, we compare the original wealth distribution inequality, T_w, with that in its smoothed (counterfactual) distribution, T_{inh}^S, which has removed the effect of transfers from the original one (see Table 4). The former shows a higher inequality than the latter in all countries, and the gross share of inequality associated with transfers is given by $Sh_{inh}^{gross} = (T_w - T_{inh}^S)/T_w$ (see Table 5). Using the MLD index, we find that transfer differences in France, Spain and the US have a significant contribution to overall wealth inequality, getting close to 40% (39.3%, 38.9% and 36.7%, respectively), while the share is slightly lower in Britain (32.8%), but still amounting to one third of the original inequality.

How does this contribution compare with the gross contribution of socioeconomic background? As with transfers, the graphical representation shows that there exists an evident connection between socioeconomic background and wealth. In all countries, the type of the best background (first-stochastically) dominates the rest of the types having, therefore, the highest wealth at all quantiles. For instance, in Figure 2 we see for France that households whose head's parents were "managers and professionals" have higher wealth than the rest of the groups, followed by the "trade, craft and middle professional" parental occupation, who in turn also have a wealth advantage over equivalently ranked households at the two other

[21] Recall that given two distributions *F* and *G*, *F* dominates *G* according to the first stochastic dominance, if and only if, $F(x) \leq G(x)$ for all $x \in [0, \infty)$.

groups (employees and manual workers parents). In Spain, we observe that households with parents in managerial occupations dominate the other three types, with a relevant wealth gap that starts early at the lower tranches of their respective wealth distributions. In Britain, households with higher parental education have greater wealth than those who left school earlier. The parental education difference is visually greater in the US, where households in which the head's parents completed tertiary education show a higher wealth at all points of the ranked distribution. Households whose parents did not finish secondary school also display a significant negative differential in wealth compared with the rest of the groups.

To quantify the gross contribution of socioeconomic background to wealth inequality, we compare again the inequality of the original distribution of wealth with our counterfactual distribution. In this case, the non-parametric smoother eliminates differences in wealth associated with the socioeconomic background (and any other factor correlated with it other than age and gender) at each percentile (tranche). The inequality of that distribution, T_{seb}^{S}, is lower than overall wealth inequality, T_w, in all countries according to the MLD index (Table), and the gross share $Sh_{seb}^{gross} = (T_w - T_{seb}^{S})/T_w$ is 22.8% and 22.3% for the US and Spain, respectively, which are the greatest among the four countries analysed and consistent with Figure 2. In France and Britain, the contributions are of 14.1% and 13.6%, respectively.[22]

As found in other studies (Cowell et al., 2019), we find that socioeconomic background does have a relevant impact on wealth inequality. Still, when put in perspective, the gross contribution of intergenerational transfers to wealth inequality is almost twice that of socioeconomic background in all countries. Importantly, this comparison of gross effects is meaningful only if both aspects (inheritances and socioeconomic background) were independent. But, are they? How large is the part of inheritance contribution associated with parental occupation or education?

To address this question, we need first to consider simultaneously both the transfer and the family background to construct the counterfactual wealth distribution. The population is now partitioned in 24 types (6 inheritances categories multiplied by 4 socioeconomic background categories) and the counterfactual distribution is calculated to remove differences in wealth associated with the combined effect of transfers and family background (recall that for Spain

[22] We are cautious about making any type of ranking among the four countries analysed. Although education and occupation seem to have comparable and interchangeable roles when proxy economic status (Palomino et al., 2019) , some of the differences we find can be attributed to the different categorization of the socioeconomic background available in the country surveys (see the data section).

we use only 20 types because there are only 5 transfer categories). Then, comparing the overall wealth inequality distribution, T_w, with the resultant smoothed for the 24 types, $T^S_{inh+seb}$, we calculate the share of the original wealth inequality attributed jointly to both factors, $Sh^{combined}_{inh+seb} = (T_w - T^S_{inh+seb})/T_w$. This combined contribution gets close to 50% in the US (47.9%) and Spain (46.4%), being just a slightly lower in France (43.6%) and 36.5% in Britain (see Table 4). In other words, removing the differences in wealth associated with the combination of transfer receipt and family background accounts for close to half of wealth inequality in some countries and for more than one third in all of them.

If both factors were independent, the share of the combined effect would be equal to the addition of their gross effects. However, we find that, in all countries, the actual joint effect contribution $Sh^{combined}_{inh+seb}$ is smaller than the addition $Sh^{gross}_{inh} + Sh^{gross}_{seb}$ (Table 5). This reveals that there exists interaction between both factors. To calculate this interaction, we measure the share of wealth inequality explained by the interaction between inheritances and family background as the following difference: $(Sh^{gross}_{inh} + Sh^{gross}_{seb}) - Sh^{combined}_{inh+seb}$. We find that the interaction effect is relevant in the four countries under analysis. In particular, this difference is equal to 9.8% in France, 15.4% in Spain, 9.9% in Britain and 11.0% in the US (Table 5).

The last step in our analysis is to obtain the net contribution shares of wealth transfers and socioeconomic background. Here, we adopt the most conservative strategy, and exclude all possible interaction from the gross contribution shares:[23]

$$Sh^{net}_{inh} = Sh^{gross}_{inh} - Sh^{interact}_{inh+seb} \tag{6}$$

$$Sh^{net}_{seb} = Sh^{gross}_{seb} - Sh^{interact}_{inh+seb}. \tag{7}$$

Despite that our estimates are actually a lower-bound of the real net contribution shares, we find that the transfers contribution is highly significant in all cases, being 29.5% for France, 23.5% for Spain, 22.8% for Britain, and 25.6% for the US. The net share of wealth inequality contributed by economic background results in a far lower estimate in the four countries: 4.3% for France, 7.4% for Spain, 3.7% for Britain, and 11.3% for the US (see Table 5).

[23] Alternatively, if the total combined effect of inheritances and family background is the sum of the net effects of inheritances and socioeconomic background, and their interaction, the net contribution shares can be calculated as $Sh^{net}_{inh} = Sh^{combined}_{inh+seb} - Sh^{gross}_{seb}$ and $Sh^{net}_{seb} = Sh^{combined}_{inh+seb} - Sh^{gross}_{inh}$, respectively.

5. Concluding remarks

This paper has analysed the contribution of intergenerational transfers (in the form of gifts and inheritances) and socioeconomic background to wealth inequality in four rich countries. Using a non-parametric framework, we find a significant contribution of inheritances and gifts to wealth inequality in all cases, between 33% and 40% in gross terms and between 23% and 29% after controlling for socio-economic background effects. Our findings also show that, despite the much-studied links between education, human capital and inequality (Cowell et al., 2019), the importance of inheritances and gifts in all countries is roughly twice that of socioeconomic background. Socioeconomic background can explain between 14% and 23% of wealth inequality in gross terms and between 4% and 11% in net terms. On the other hand, the combined contribution of inheritances and parental background approaches half of overall wealth inequality in three of the four countries analysed, and in all cases, it is significantly greater than one-quarter.

These results demonstrate the value of the innovative analytical approach we have employed to assess the role of intergenerational wealth transfers and socioeconomic background in overall wealth inequality, which adds a different perspective to the existing literature. Although the case for taxation of intergenerational wealth transfers does not rest entirely on their role in underpinning wealth inequality -it can also be seen, for example, as an administratively convenient way to tax wealth by proxy for revenue collection purposes- if inheritances are also seen to be disequalising rather than equalising, broader normative rationales for taxing can be more easily supported. The results reported here, applying across a set of rather different rich countries, are thus of considerable significance from methodological, empirical and normative perspectives.

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1. Tables and Figures

Table 1. Samples.

France. Monetary measures in 2016 USD.

	Full Sample	Sample aged between 35 and 80	Sample aged between 35 and 80 and excluding negative wealth	Sample aged between 35 and 80, excluding negative wealth and equivalising wealth and inheritance	Sample aged between 35 and 80, excluding negative wealth and using adjusted equivalent wealth and inheritance
Observations	11648	9459	9235	9235	9235
Share of inheritance recipients	31.9%	35.9%	36.1%	36.1%	36.1%
Average age	53.3	55.9	56.0	56.0	56.0
Average age of recipients	56.9	58.0	58.1	58.1	58.1
Average wealth	250730	292039	300234	174607	268565
Average inheritance (among recipients)	182696	182657	184052	117670	117670
Wealth MLD Index	NA	NA	1.12	1.07	1.05
Bottom 50% Wealth Share	6.3%	8.5%	9.4%	9.9%	9.8%
Top 20% Wealth Share	67.1%	64.1%	63.3%	62.6%	63.9%
Top 10% Wealth Share	49.7%	47.3%	46.7%	45.9%	46.9%

Spain. Monetary measures in 2016 USD.

	Full Sample	Sample aged between 35 and 80	Sample aged between 35 and 80 and excluding negative wealth	Sample aged between 35 and 80, excluding negative wealth and equivalising wealth and inheritance	Sample aged between 35 and 80, excluding negative wealth and using adjusted equivalent wealth and inheritance
Observations	5949	5189	5066	5066	5066
Share of inheritance recipients	28.6%	29.5%	30.4%	30.4%	30.4%
Average age	53.8	54.8	55.0	55.0	55.0
Average age of recipients	58.4	58.9	58.9	58.9	58.9
Average wealth	301249	329708	341423	180129	283399
Average inheritance (among recipients)	298905	295059	295880	154559	154559
Wealth MLD Index	NA	NA	0.81	0.80	0.74
Bottom 50% Wealth Share	12.1%	13.0%	14.2%	14.0%	14.9%
Top 20% Wealth Share	61.2%	60.2%	59.3%	59.1%	56.9%
Top 10% Wealth Share	45.1%	44.5%	43.8%	43.0%	40.2%

Great Britain. Monetary measures in 2016 USD.

	Full Sample	Sample aged between 35 and 80	Sample aged between 35 and 80 and excluding negative wealth	Sample aged between 35 and 80, excluding negative wealth and equivalising wealth and inheritance	Sample aged between 35 and 80, excluding negative wealth and using adjusted equivalent wealth and inheritance
Observations	12779	10913	10218	10218	10218
Share of inheritance recipients	32.0%	32.9%	34.8%	34.8%	34.8%
Average age	55.5	55.5	56.0	56.0	56.0
Average age of recipients	56.8	57.2	57.5	57.5	57.5
Average wealth	330990	361601	398924	141834	227632
Average inheritance (among recipients)	240454	236398	243496	140862	140862
Wealth MLD Index	NA	NA	1.06	1.05	1.02
Bottom 50% Wealth Share	7.8%	9.4%	12.7%	12.3%	12.4%
Top 20% Wealth Share	62.7%	61.1%	58.2%	58.4%	59.1%
Top 10% Wealth Share	44.2%	43.1%	40.9%	41.1%	41.7%

United States. Monetary measures in 2016 USD.

	Full Sample	Sample aged between 35 and 80	Sample aged between 35 and 80 and excluding negative wealth	Sample aged between 35 and 80, excluding negative wealth and equivalising wealth and inheritance	Sample aged between 35 and 80, excluding negative wealth and using *adjusted* equivalent wealth and inheritance
Observations	6248	4914	4486	4486	4486
Share of inheritance recipients	17.9%	20.2%	21.7%	21.7%	21.7%
Average age	51.0	55.5	56.3	56.3	56.3
Average age of recipients	58.1	59.9	60.2	60.2	60.2
Average wealth	554840	676958	758578	407758	638827
Average inheritance (among recipients)	399756	410345	423570	258529	258529
Wealth MLD Index	NA	NA	2.06	2.03	1.83
Bottom 50% Wealth Share	0.6%	1.5%	2.8%	2.9%	3.6%
Top 20% Wealth Share	90.1%	88.5%	86.7%	86.2%	83.7%
Top 10% Wealth Share	80.5%	78.8%	76.9%	76.1%	72.2%

Table 2. Negative wealth and inheritances.

	Share negative wealth		Share receiving inheritance			Share receiving large inheritance		
	Unweighted	Weighted	Household with positive wealth	Households with positive wealth (bottom half)	Households with negative wealth	Household with positive wealth	Households with positive wealth (bottom half)	Households with negative wealth
France	2.37%	2.53%	36.14%	25.74%	24.93%	9.03%	3.81%	2.99%
Spain	2.37%	3.23%	30.36%	24.20%	3.29%	7.55%	3.88%	0.03%
UK	6.37%	9.07%	34.83%	23.57%	13.77%	8.71%	3.64%	1.27%
US	8.71%	10.38%	21.66%	13.93%	7.42%	5.41%	1.04%	0.68%

Note: All measures weighted using sampling weights except first column (for reference).

Table 3. Inheritances amount and parental occupation.

	France	Spain	Britain	US
Inheritance amount at the 25th percentile	15795	26567	15397	24784
Inheritance amount at the median	39379	57347	41559	59776
Inheritance amount at the 75th percentile	105615	132862	105831	150205
Share of non-recipients expecting an inheritance	30.2%	NA	27.5%	9.8%
Share with parental level 1 occupation	39.8%	38.5%	44.0%	18.3%
Share with parental level 2 occupation	17.8%	24.6%	26.2%	33.4%
Share with parental level 3 occupation	19.6%	14.1%	24.4%	14.8%
Share with parental level 4 occupation	22.9%	22.8%	5.4%	33.5%
Share of women household heads	34.7%	38.5%	35.6%	43.0%

Note: All measures weighted using sampling weights. Sample used is aged between 35 and 80, excluding negative wealth and equivalising wealth and inheritance (fourth column of Table 1).

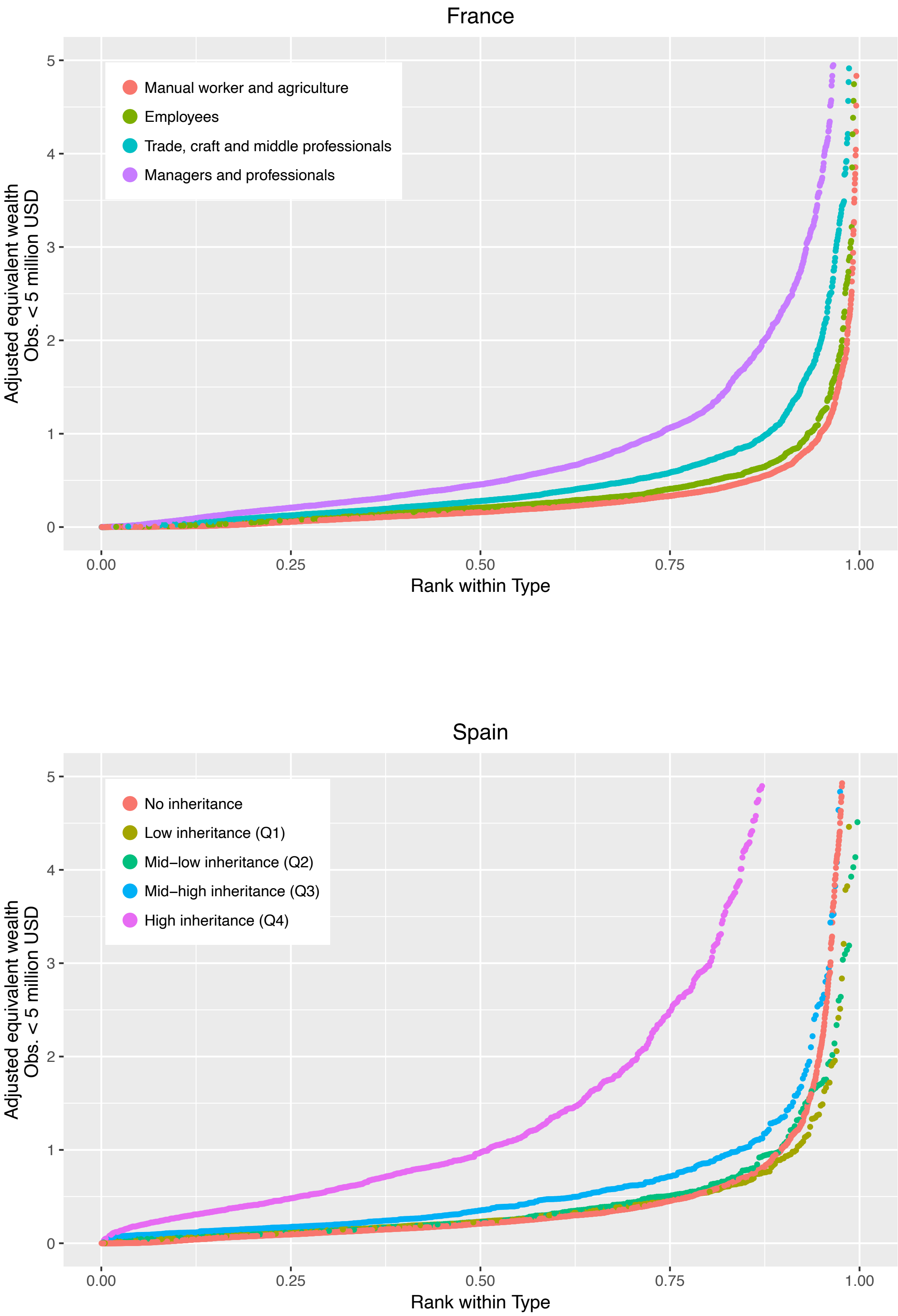
Table 4. Inequality of smoothed wealth distributions.

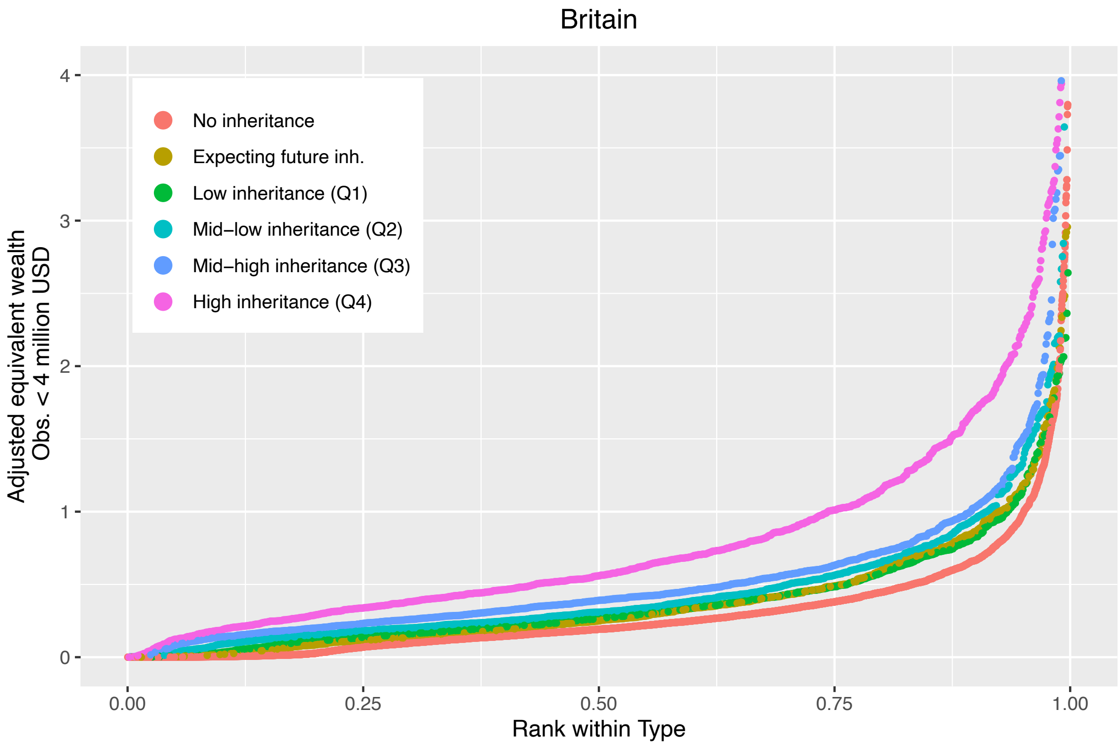
		MLD Index			
		France	Spain	Britain	US
Original Adjusted Wealth Distribution	T_w	1.047	0.744	1.021	1.831
		(0.032)	(0.035)	(0.022)	(0.043)
Inheritance Smoothed	T_{inh}^{S}	0.635	0.454	0.686	1.160
		(0.024)	(0.023)	(0.014)	(0.034)
Socioeconomic Background (SEB)	T_{seb}^{S}	0.899	0.574	0.882	1.423
		(0.030)	(0.025)	(0.019)	(0.035)
Inheritance and SEB Smoothed	$T_{inh+seb}^{S}$	0.590	0.399	0.649	0.954
		(0.018)	(0.017)	(0.014)	(0.030)

Table 5. Contributions to inequality of inheritances and socioeconomic background, as a share of total wealth inequality

		MLD Index			
		France	Spain	Britain	US
Gross Inheritance Contribution	Sh_{inh}^{gross}	39.3%	38.9%	32.8%	36.7%
Gross SEB Contribution	Sh_{seb}^{gross}	14.1%	22.8%	13.6%	22.3%
Combined Inheritance and SEB Contribution	$Sh_{inh+seb}^{combined}$	43.6%	46.4%	36.5%	47.9%
Net Inheritance Contribution	$Sh_{seb}^{net} = Sh_{inh+seb}^{combined} - Sh_{seb}^{gross}$	29.5%	23.5%	22.8%	25.7%
Net SEB Contribution	$Sh_{seb}^{net} = Sh_{inh+seb}^{combined} - Sh_{inh}^{gross}$	4.3%	7.4%	3.7%	11.3%
Interactive Inheritance and SEB Contribution	$Sh_{inh+seb}^{interact.} = Sh_{inh}^{gross} + Sh_{seb}^{gross} - Sh_{inh+seb}^{combined}$	9.8%	15.4%	9.9%	11.0%

Figure 1. Wealth and inheritances received.




Britain
No inheritance
Expecting future inh.
Low inheritance (Q1)
Mid–low inheritance (Q2)
Mid–high inheritance (Q3)
High inheritance (Q4)
Adjusted equivalent wealth
Obs. < 4 million USD
4
3
2
1
0
0.00
0.25
0.50
0.75
1.00
Rank within Type

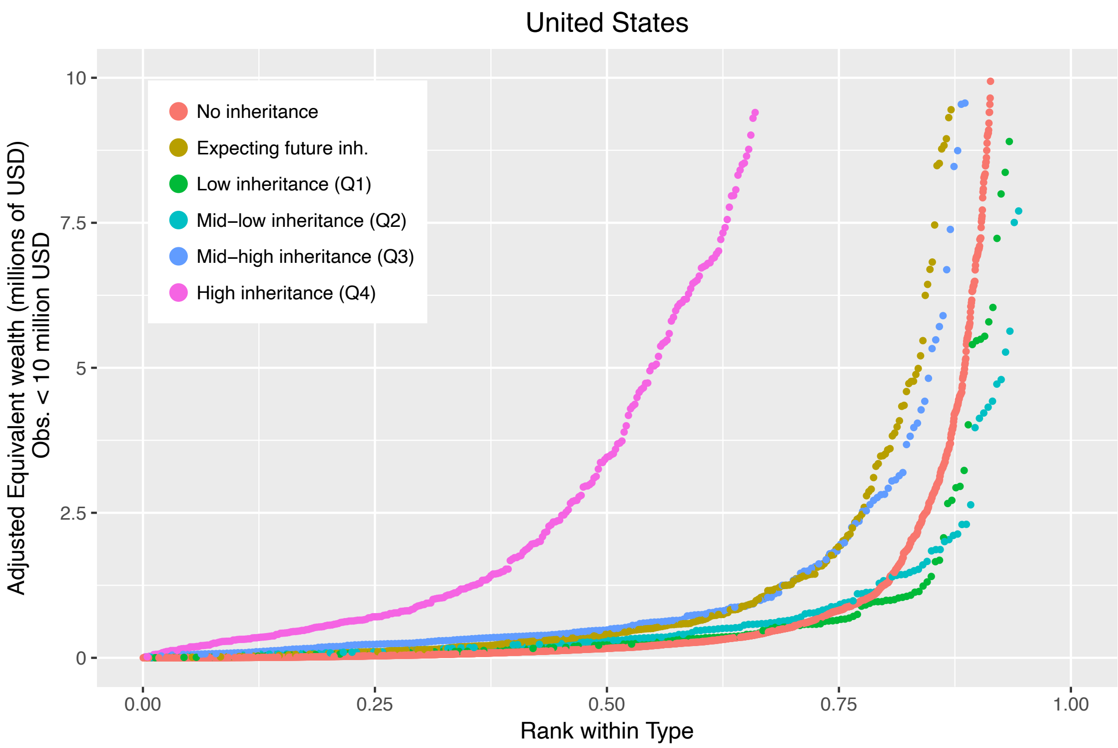
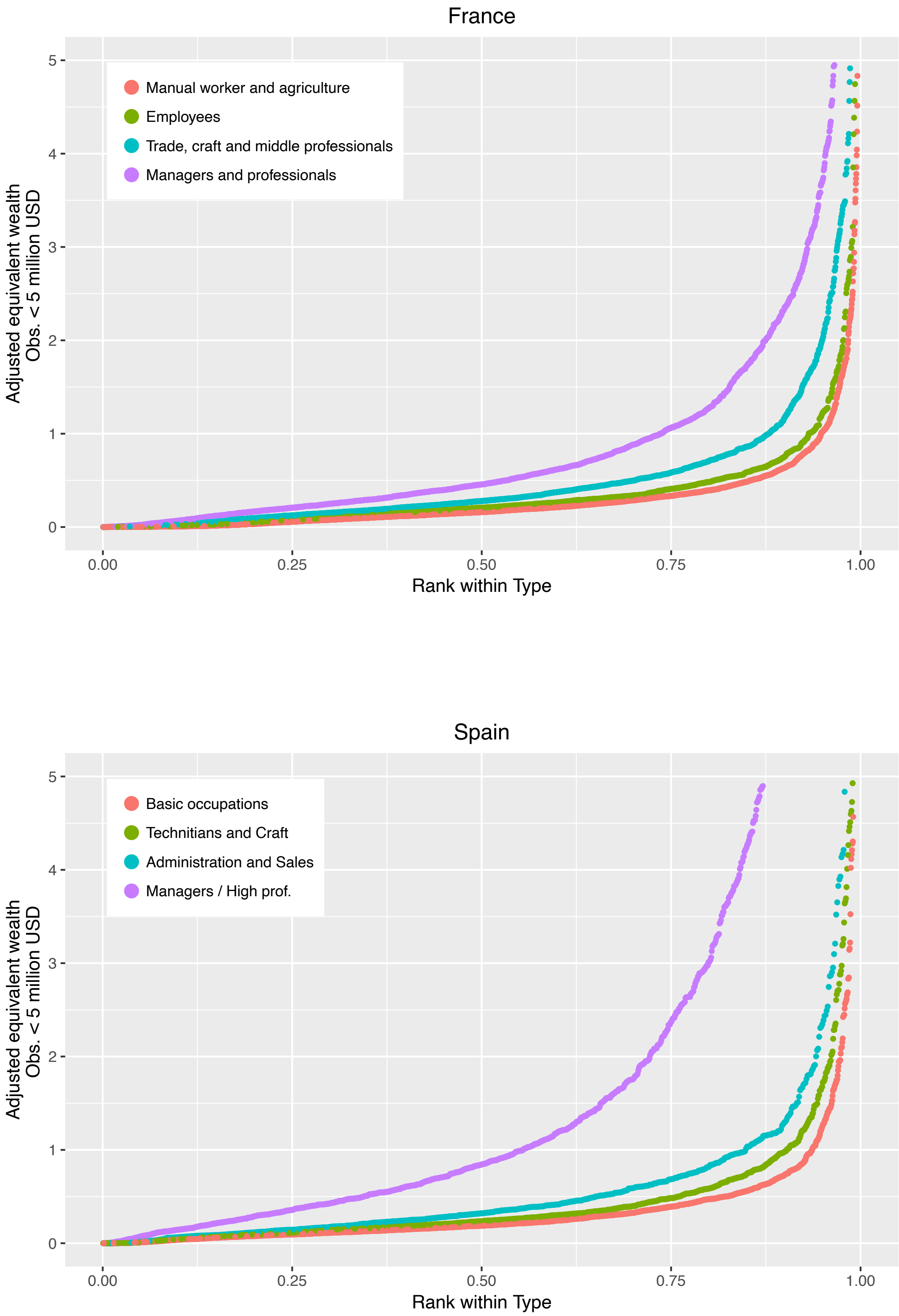
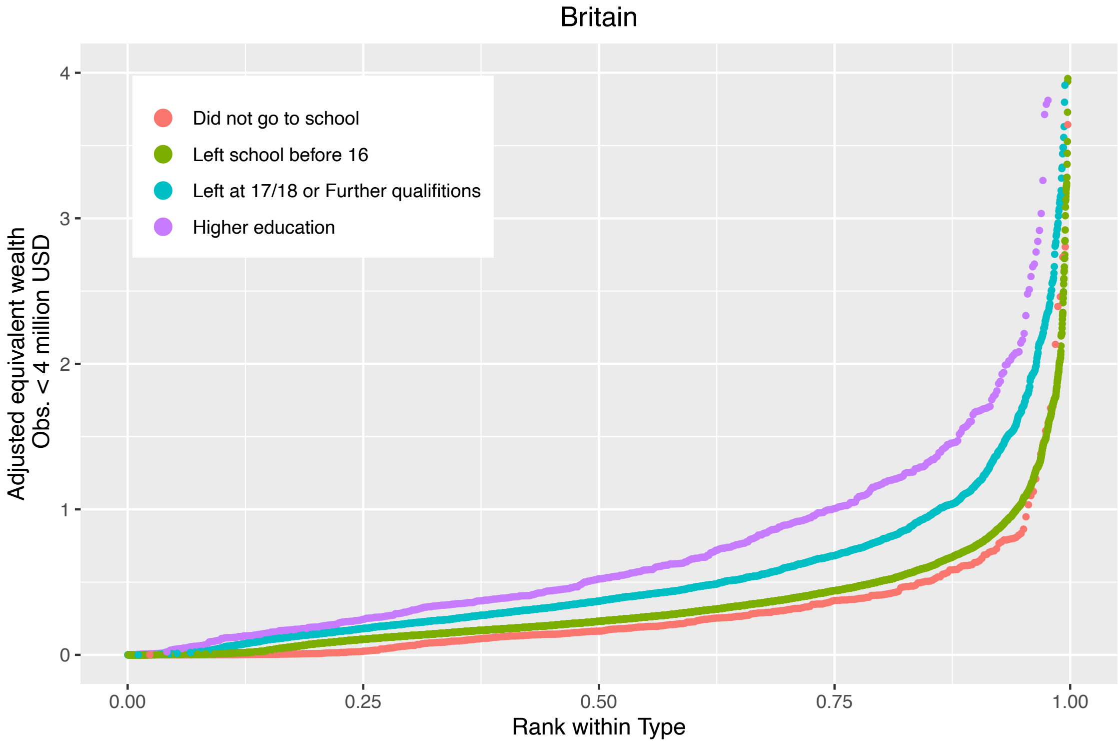
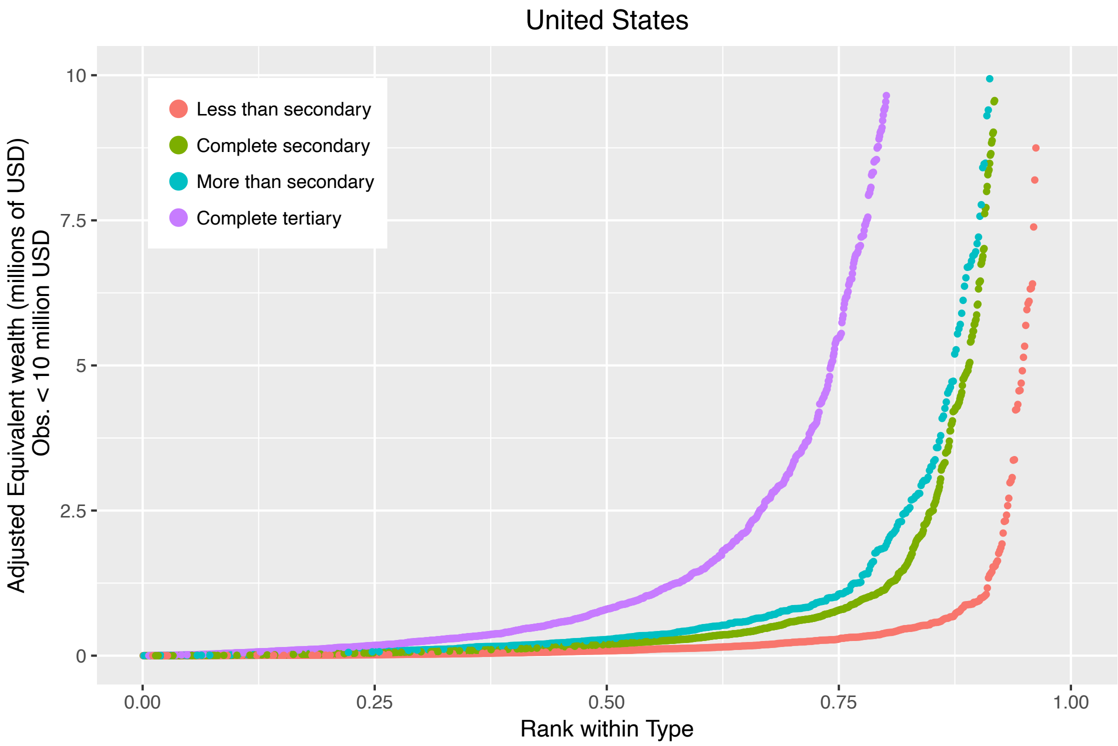

United States
No inheritance
Expecting future inh.
Low inheritance (Q1)
Mid–low inheritance (Q2)
Mid–high inheritance (Q3)
High inheritance (Q4)
Adjusted Equivalent wealth (millions of USD)
Obs. < 10 million USD
10
7.5
5
2.5
0
0.00
0.25
0.50
0.75
1.00
Rank within Type

Figure 2. Wealth and parental background.




Britain
Did not go to school
Left school before 16
Left at 17/18 or Further qualifitions
Higher education
Adjusted equivalent wealth
Obs. < 4 million USD
4
3
2
1
0
0.00
0.25
0.50
0.75
1.00
Rank within Type


United States
Less than secondary
Complete secondary
More than secondary
Complete tertiary
Adjusted Equivalent wealth (millions of USD)
Obs. < 10 million USD
10
7.5
5
2.5
0
0.00
0.25
0.50
0.75
1.00
Rank within Type

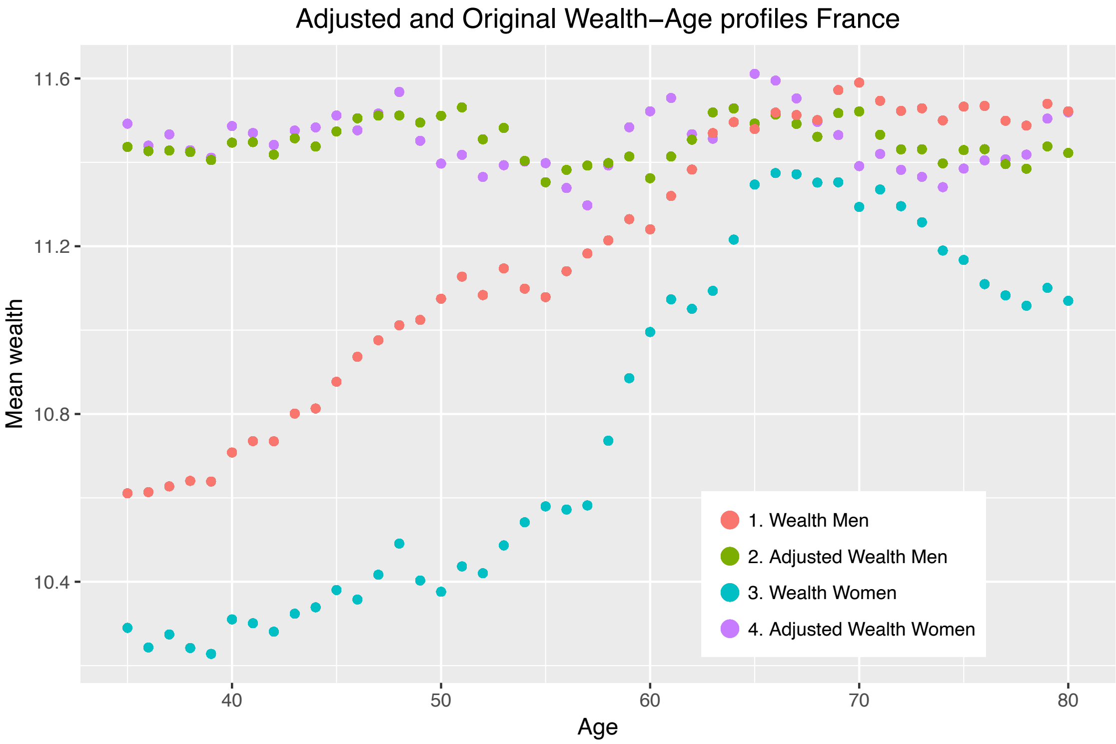
Appendix

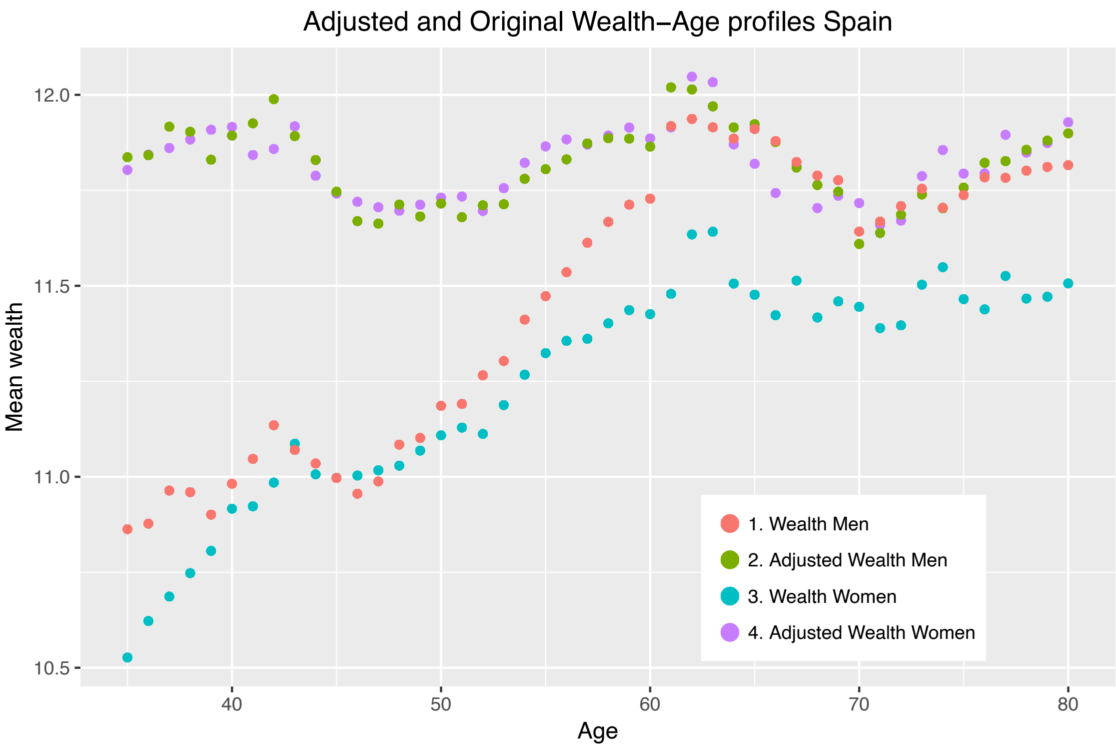
Table A1. OLS regression coefficients of log wealth on age and gender variables.

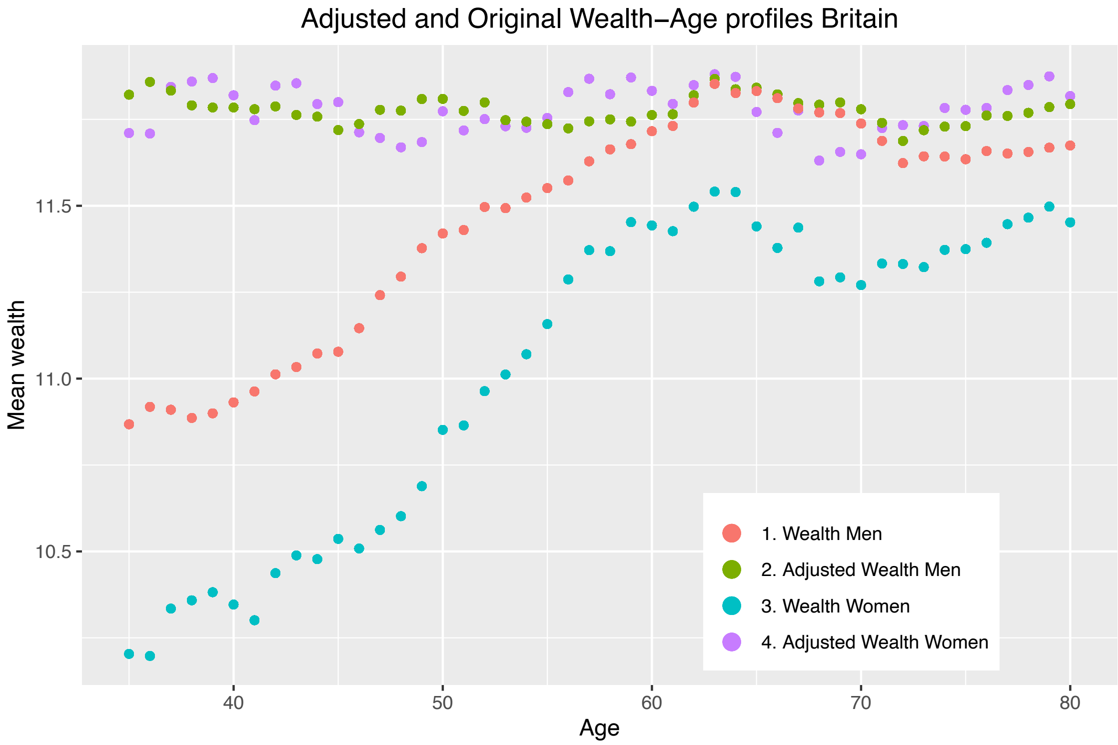
	France			*Spain*		
	Estimate	*S.E.*	*p*	*Estimate*	*S.E.*	*p*
α (Intercept)	11.454	0.041	<0.001	11.81	0.055	<0.001
β_1(Age difference)	0.021	0.007	0.003	0.018	0.009	0.042
β_1 (Age difference)^2	-0.001	0.000	0.028	-0.002	0.000	<0.001
β_1 (Age difference)^3	0.000	0.000	0.675	0.000	0.000	0.635
β_1 (Age difference)^4	0.000	0.000	0.986	0.000	0.000	0.74
F (Female dummy)	-0.244	0.067	<0.001	-0.342	0.086	<0.001
γ_1 (Interaction female-age difference)	0.033	0.011	0.004	0.004	0.013	0.785
γ_2 (Interaction female-age difference)^2	-0.001	0.001	0.03	0.001	0.001	0.076
γ_3 (Interaction female-age difference)^3	0.000	0.000	0.006	0.000	0.000	0.371
γ_4 (Interaction female-age difference)^4	0.000	0.000	0.081	0.000	0.000	0.087
Observations		9235			5066	
R2		0.049			0.05	
R^2 adjusted		0.048			0.049	

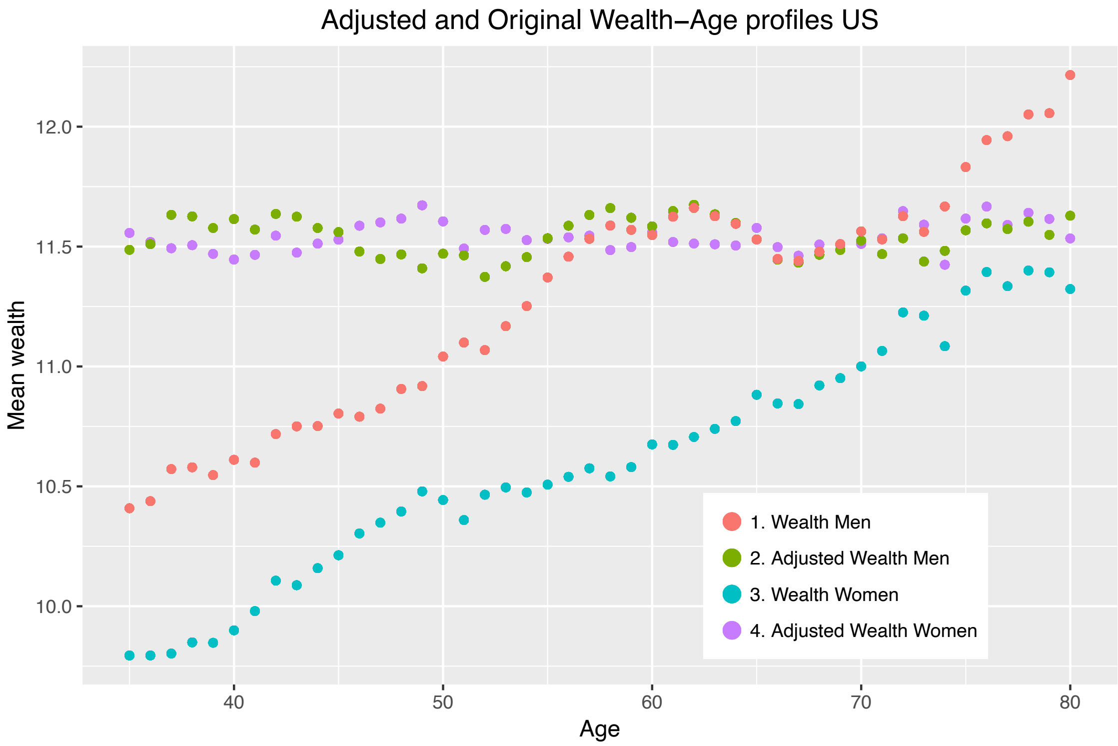
	Britain			*US*		
	Estimate	*S.E.*	*p*	*Estimate*	*S.E.*	*p*
α (Intercept)	11.775	0.045	<0.001	11.537	0.079	<0.001
β_1(Age difference)	-0.002	0.007	0.821	-0.001	0.013	0.925
β_1 (Age difference)^2	-0.002	0.000	<0.001	0.000	0.001	0.869
β_1 (Age difference)^3	0.000	0.000	0.263	0.000	0.000	0.009
β_1 (Age difference)^4	0.000	0.000	0.102	0.000	0.000	0.015
F (Female dummy)	-0.318	0.075	<0.001	-0.692	0.111	<0.001
γ_1 (Interaction female-age difference)	-0.002	0.012	0.878	0.042	0.019	0.026
γ_2 (Interaction female-age difference)^2	-0.001	0.001	0.235	0.001	0.001	0.553
γ_3 (Interaction female-age difference)^3	0.000	0.000	0.369	0.000	0.000	0.030
γ_4 (Interaction female-age difference)^4	0.000	0.000	0.199	0.000	0.000	0.024
Observations		10218			4486	
R2		0.045			0.064	
R^2 adjusted		0.044			0.062	

Figure A1. Age wealth profile by gender of the household head.
(rolling mean over 9 years centred intervals)






Adjusted and Original Wealth−Age profiles Britain
Mean wealth
11.5
11.0
10.5
40
50
60
70
80
Age
1. Wealth Men
2. Adjusted Wealth Men
3. Wealth Women
4. Adjusted Wealth Women


Adjusted and Original Wealth−Age profiles US
Mean wealth
12.0
11.5
11.0
10.5
10.0
40
50
60
70
80
Age
1. Wealth Men
2. Adjusted Wealth Men
3. Wealth Women
4. Adjusted Wealth Women