The Age-Wealth Relationship:
An Analysis of Nineteenth and early Twentieth Century French Data

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PRELIMINARY VERSION

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1. Introduction

This paper re-examines the age-wealth relationship, relying on a new large data set, drawn from the fiscal probate records of French families followed over five generations. Age is supposed to affect wealth through different channels. First, the life-cycle hypothesis (Modigliani and Brumberg, 1954) assumes that intertemporal consumption smoothing is the only motive for holding wealth. This view argues that, in the absence of a pension system or a family support, people accumulate wealth when they are young and dissave when they are retired. Thus, income smoothing results in a hump-shaped pattern for wealth by age. With no uncertainty, the life-cycle model predicts that wealth first rises with age and then declines to zero, with a peak close to the date of retirement. Uncertainty about lifespan, earnings or interest rates can change the shape of

the wealth-age profile by increasing precautionary savings. A second major extension of the model includes bequest motives for wealth accumulation. A person can save more than her own consumption needs, in order to leave bequests to his/her children. On the other hand, wealth at death might not be a good measure of wealth accumulated during life-time because it might be diminished by intra-vivos gifts. Overall, age alone might explain a significant proportion of observed wealth inequality, a point raised by Atkinson (1971) and taken over among others, by Kessler and Masson (1988).

Empirically, the effect of age on wealth has been estimated using two types of data that do not provide the same picture. Household surveys show a significant age effect on wealth. A hump-shaped pattern in accordance to the life-cycle hypothesis appears for households with intermediate level of wealth, excluding the poorest and the richest (Wolff 1980, Masson, 1986). On the other hand, individual estate tax data conclude that observed wealth is increasing with age. The gap between the two pictures comes first from the difference in the samples: household surveys are representative of ordinary people, while estate-tax statistics are biased towards the affluent. Moreover, as estate-tax data are cross-sectional data, they are poor proxies for longitudinal profiles for two reasons. To begin with, differential mortality biases cross sectional evidence. If the rich live longer, the composition of groups of elderly will be biased towards the rich. Shorrocks (1975) recomputes mortality-adjusted cohort profiles assuming an exogenous smaller mortality rate for rich people and retrieves the hump pattern. A second problem is that, because of secular growth, a younger cohort is likely to be better off than an older one. The decline for old ages observed in a cross section would just signify that older people belong to a cohort that began its working life before a period of expansion. Masson (1986) refines the argument: economic growth might not be uniform and could alter the age distribution of wealth, making the inference of life-time profiles from a single cross-section almost an impossible task.

In this paper, we reconsider age-wealth relationships by adding two factors. First, we include the significant share of the population that has no property. Since in our data, wealth is measured at the time of death, those without any reported asset are the most likely to conform to the pure life-cycle theory: they earned their living and perhaps accumulated some capital, but ended up consuming all of it. As the share of people without assets at death rises significantly during the nineteenth century, it is important to include them in the overall wealth distribution. Second, we find that life-cycle patterns have changed over time due partly to economic factors, to some extent because of the great depression of the 1870s-1880s in France, or the First World War, and also partly due to the change in the age structure of the population. Indeed, besides the oft cited structural changes of the nineteenth century, such as industrialization, urbanization, mass schooling, and the progressive development of a new pension system, a parallel phenomenon occurred of similar significance: the decrease in mortality and fertility ratios, that began quite early in France. Moreover, the secular change in the age structure benefited mainly women: their life expectancy increased while that of males stagnated. We argue that overall population aging implied significant changes in the wealth distribution. The bias in the aging of the population mattered as well since the wealth distribution itself was initially not gender-neutral. Together with the effect of age on wealth distribution, this paper will thus focus on a possible gender effect.

We will look at the evolution of the age-wealth relationship using French private estates during the nineteenth and early twentieth centuries. The sample is drawn from fiscal data on wealth recorded at death for the period 1800-1940 and is representative of ordinary households in France of various social and geographical origins.

In the following, we will briefly present the data (section 2) before assessing the age effect on wealth taking into account the people who have no property (sections 3 and 4). As the effect changes by gender over time, the paper explores the possible underlying mechanisms and their consequence on wealth inequality (section 5).

2. The dataset.

The dataset is drawn from two types of fiscal records (the *Tables of Inheritants and Absent people* and the *Registers of Transfers after Death)* that provide the date of a decedent's death, his or her age, marital status, profession, residence and wealth.[2] These fiscal records contrary to private probate inventories cover all decedents between 1800 and 1940. Moreover, the records remain almost identical over time. The source is therefore closer to a household survey and is not biased towards the richest part of the population. By definition, it neglects sources of earnings such as pensions, life-annuities or life-insurances, since then the capital dies out together with the income stream at the pensioner's death. A special case will be widows: at the husband death, a women often inherited a pension or the right to use her husband's capital (the *usufruct*) without the plain ownership of it. As a consequence, at her own death, she may appear as owning no asset (more on this below).

Two types of information on wealth will be used throughout the paper. The first is the mere existence of assets at the time of death. This information is available in the *Table of Inheritants* for the whole period. The second information concerns the level and composition of

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[2] The data are extracted from the « 3000 families survey » initiated by J. Dupâquier and D. Kessler in the early 1980s. The target was to reconstruct the descending genealogies of 3000 couples married between 1803 and 1832 in France. The population was chosen with a name beginning by the three letters T,R,A. The true degree of representativeness of our sample is addressed in a companion paper. Note that our wealth variable requires many caveats. In particular, since individual situations are described after death, wealth could be underestimate because of terminal illness, burial costs, or over-consumption. Moreover, because of its fiscal nature, our source captures fixed

wealth. The latter is available in the *Table of Inheritants* until around 1880 and thereafter with considerably more detail but on a limited sample in the *Register*. Data collection for the *Table of Inheritants* is complete and thus offers a representative sample of the French population. Data collection from the *Registers of Transfers* must proceed *département* by *département* (the equivalent of a county) and the sample is not yet representative of the whole of France. Hence those data were weighted to make the sample representative on the basis of the complete data from the *Table of Inheritants* (see Appendix 1).

In the sample of decedents between 1800 and 1940, we distinguish complete cohorts, that is, those born between 1780 and 1860. We will also focus on the subset of individuals whose parent was identified. The parent's wealth will then be used as a proxy for the child's initial wealth.[3]

Over time, the changing wealth distribution can be related to the evolution of economic and socio-political patterns. Recall, in particular, that GDP growth was highly uneven over time: quick in the 1830s and 1840s and even more so until the mid-1860s, it decelerated during the last third of the nineteenth century and became very unsteady during the first part of the twentieth century (see Figure 1).[4]

<Figure 1 about here>

3. Who are the asset owners?

Wealth distribution is more unequal than income, simply because a large part of population own no assets. We call this distinction between assets owners and the rest of the

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asset better than moveables and could be heavily biased by fraud. Yet, here, this problem appear to be a minor issue : see Appendix 3.

[3] See Bourdieu, Postel-Vinay, Suwa-Eisenmann (2000), that provides a first attempt at characterizing intergenerational transmission in this dataset.

[4] See Lévy-Leboyer & Bourguignon (1985).

population the primary type of inequality and the distribution of wealth among the assets owners themselves the secondary type of inequality.

The primary inequality can be measured as the percentage in the total population of individuals who died with an estate (we will call them rich) during a given period (a year, a decade, or more). But then, there is a risk that we are lumping people who died old with others who lived just a few years and have thus experienced very distinct economic environments. We can also consider individuals born during a given period. Of course, the same kind of risk exists since, in a given cohort, some will die young while others will live longer. In both cases, one can begin to control for this heterogeneity by distinguishing different age groups. Figure 2 shows the percentage of rich among all adults of our sample. One curve shows the percentage for people by decadal birth cohort from 1780 to 1900 and the other by death cohort1800 and 1940. As expected, the former evolved more or less like the other with a lag. But in both cases, the striking feature is the secular decrease of the share of the population that left an estate. If we limit ourselves to cohorts whose members had all died by 1940 (for example individuals born before the 1860s) the share of rich by cohorts of birth decreases from 65 percent to 55 percent between 1780 and 1820, then decreases again after 1840 to below 50 percent. Obviously this decrease of the share of asset owners may have various reasons. Urbanization[5] and industrialization[6] can play a major role. Cities, especially Paris, were home to both extreme poverty and extreme wealth. Agricultural decline might have impoverished people or the growth of wage labor in

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[5] The French urban population grew from hardly one fifth to half of the total population during the period considered. However, at least until the 1880s, rural and urban activities were strongly interconnected, except in large cities like Paris. Therefore, urbanization and industrialization must be understood as two different types of structural changes.

[6] Industry and services slowly outweigh the agricultural sector : at the beginning of the 19th century, the latter employ two thirds of the labor force while, in the 1930s, the three sectors have become roughly of equal size. See, for instance, Marchand & Thélot (1991:170-73).

manufacturing and services might have given them access to occupations where no professional capital was needed.

<Figure 2 about here>

Table 1 presents some characteristics of wealth owners compared to non wealth owners which confirm these conjectures. It is worthwhile to note, for instance, that people who lived in the countryside – farmers in particular – were overwhelmingly rich (that is, asset owners) while the majority of Parisians were poor. Note also that working in the public sector did not fully protect from 'poverty', as if public pensions might have substituted for the requirement of holding some wealth for the old days. But we must leave this question for further research,

Overall, our evidence fits the classical hump-shaped pattern of individual wealth over the life-cycle even if it suggests that the age effect has limitations and requires qualifications. To begin with, when studying the size distribution of wealth, the relevant population clearly consists of all individuals, whatever their age and whether they leave any wealth at death or do not. Including everyone is particularly important for measuring primary inequality between 'rich' and 'poor', here defined by asset ownership at death.

Everyone is everyone. Even though many studies on wealth inequality limit themselves to adults, it seems necessary – at first, at least – to include the younger part of the population.[7] Indeed children – especially those who died as infant -- are unlikely be assets owners. Taking them into account thus modifies the measure of primary inequality, and emphasizes the importance of demographic changes in altering wealth inequality.

On this point unfortunately, our data suffers serious limitations. As most often young people left no asset at death, fiscal officials were not very keen to record them at the beginning

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[7] See, for instance, Lindert (1991:214) : "The most relevant population is all individuals, including those who die as infant".

of the period under study. Admittedly, records became progressively more reliable, but the situation of infants and children was imperfectly observed during the first decades of the nineteenth century. That is why, at this stage, we shall limit ourselves to a rough measure of the part played by infants and children in the overall wealth inequality. If we just ignore the sample bias and take children into account, then, for the whole period under survey, the poor are more than half of the population (54 percent on average from 1800 to 1939). If we neglect children, then, the share of the poor is significantly lower (40 percent). [8]

The decision to include or not children affects the evolution of primary inequality over time. [9] The young were more than others vulnerable and remained so during most of the period as improvements in life expectancy among infants were slow. One out of six or seven children died in the year following his birth during the century up to World War I, and one-tenth of infants still did not survive their first year in the 1920s. Moreover, such figures are just averages, and the proportion was higher for the poor than for the rich. As the proportion of children dramatically declined during the demographic transition, this composition effect is likely to have resulted in a significant decrease in the primary inequality (going against the overall pattern of figure 2).

If one considers the whole population of decedents, those who died wealthy were 59 while the poor were 31 on average, and even 28 for the majority of the poor, those who earned their living but ended without property (table 1, column 2).

<Table 1 about here>

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[8] Here we define children as individuals younger than 20. Yet, for studying protracted periods of time no such threshold is really self-evident. Note that because many researchs on inequality used fiscal data on income, they often focus on adults (20 years old and more).

[9] If we include children, the share of poor would have increased steadily, from 34 percent in 1820-30 to 56 percent in 1910-20 before decreasing to 44 percent (its 1880 level) before WWII. This would have been more consistent with the classical Kuznets curve; but, given the sample bias mentioned above, the initial increase at least is a pure chance result.

If we neglect children, the connection between age and wealth is less straightforward even if the results of Table 1 are not a priori inconsistent with the life-cycle hypothesis. Individuals who survived childhood and became poor adults died at 56 on average, i.e. much younger than the rich (who died at 61). The argument could thus be that, for those who were poor, retirement was not an expectation. Their life expectancy was not long enough and thus saving for their old age was not a concern: retirement could simply not be dreamt of. By contrast, rich adults were in a different situation since their life was on average five years longer.

A closer examination of our results raises problems, however. Among the poor in particular, some lived either as long, or longer, than the rich. Consider paupers, for instance (col.1). Paupers were formally identified by contemporary local officials as earning no income at all for various reasons: some were handicapped or insane or in prison, others, whether able-bodied or not, lived on public relief or private charity. Unlike the ordinary non asset owners who were young, frequently lived in cities and earned their living even if they did not save enough to generate wealth paupers, were more likely to dwell in rural parishes, have neither income nor assets and to be older (59 years on average). Yet, to some extent, they were taken care of by local institutions. Note that their share of the total population – about ten percent – diminished over time.

Yet, beyond paupers, the negative effect of poverty on life expectancy was not simple. To be sure poverty killed the weak poor, especially when they were young or very young, and wealth did reduce the risk of dying young. Although it protected the young rich, wealth, however, did not necessarily allow them to live a long life and grow very old. One may even think that the contrary was more likely and that the hardy poor who survived their difficult youth had a life expectancy longer than average. Actually this was true for women only. Figure 3 shows how age at death evolved over time by gender and wealth ownership: to focus on people

who had survived the risks of the first part of life, it considers only individuals aged 35 and more. While the gap in life expectancy between rich and poor men was both important and enduring, after the mid-nineteenth century women without wealth died at the most advanced age. The evidence of a possible effect of wealth on age is therefore not as straightforward as it might seem in the first place. Rich do not live longer, once controlled for gender and for the risks inherent to the first part of life. Poor women live on average longer than rich women, had they survived their 20s (and childbearing); the difference was even more significant for poor women living from charity. But then, who took care of the growing number of these poor elderly women?

<Figure 3 about here>

A first test of the age effect on wealth can be made simply by looking at the existence of an estate at the end of life. If the probability of owning an asset follows a hump-shape pattern with age, it would be consistent with a pure life-cycle motive, where assets are accumulated only as a mean to support old age expenses. Table 2 shows a simple probit regression of the form : z_{it} = f(a_{it}, x_{it}), with z_{it} the probability of owning some assets at the time of death, a_{it} the age at death and individual characteristics x_{it}. The functional form chosen here is simply age plus age squared, without controlling the possible endogeneity of age (the coefficient of age is supposed to be orthogonal to the residual). [10] Age explains partly the probability of owning any assets, with a maximum at 63 years old or more (depending on the specification), which is higher than the mean age at death in the sample (58 years old). Therefore, the probability of dying without assets despite having accumulated some wealth during one's working life is not ruled out, but seems quite rare. The hump-shape pattern is significantly different by gender. The age at which

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[10] Other forms were tested which preserve the non-linearity in age (King and Dicks-Mireaux 1982)). See also di Matteo (1998) for a discussion of alternative forms of the lifecycle model on nineteenth century Ontario data.

the probability of owning an asset is at its maximum is higher for men than for women, a pattern that will be found for all specifications. For men, the turning point is at around 70 years old, which, given the lower mean age at death for men, is likely to be uncommon. For women, on the other hand, the turning age is ten years earlier, near 60 years old. By periods, the age effect appears stable until 1870 then significantly different after 1870 relative to before, with a higher maximum age at the turn of the century. When other explanatory variables are added, the fit is improved significantly. Not surprisingly, the probability of owning an asset is also positively related to working in agriculture or living in a rural area and not in Paris. On the contrary, being handicapped or ill, or being a widow(er) influences negatively the probability of owning an asset. Some of these variables might not be exogenous : [11] people living in the countryside and working in agriculture are more likely to own some acres of land, that in turn are easier to observe at death than cash for instance. But farmers are not all landlords and agricultural workers are quite numerous in our dataset. Moreover, living in the countryside is not directly linked to wealth : we shall come back to it later.

4. Age effect among asset owners

The previous results suggest that wealth accumulation during the life-cycle evolved over time. To be sure, the conditions in which people saved depended on economic shocks, social changes (such as new retirement schemes, or massive schooling), and aging.

First, a generation might have been active during a period of rapid growth while another one might have faced either economic stagnation, crises or wars. Moreover, these conditions did not always have the same impact on everyone. Actually, they often bear quite differently on men

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[11] The correlation between the variable *'handicap'* and asset ownership is low (0.3). The 'paupers' are a specific group indeed among the 'poor'.

and women. For instance, female participation rate hardly changed: during the period under study, two thirds of the labor force remained male. As a result, the changing economic conditions were likely to affect men's rather than women's wealth. It is also worth noticing that the pension system which slowly developed over the late nineteenth and early twentieth century benefited men more than women.

Second, human capital became more widespread, in particular through massive schooling. During the nineteenth century, literacy rate did increase dramatically for men; but it did even more so for women.

Last, a major fact to underscore is that people tended to live older. Admittedly changes were slow (except for infant mortality which, as mentioned earlier, declined late but quickly, in the first part of the twentieth century). Male life expectancy remained almost stable from the mid-eighteenth century to the interwar period; and female life expectancy increased only little by little. The trend was regular, however, and its eventual result was of major importance. As one knows, during the century and a half under consideration, a demographic transition occurred everywhere in Europe although at different rates. In France, it was particularly significant because it started earlier than elsewhere – i.e. in the eighteenth century. But the lengthening of life expectancy was not general. Rather it was highly asymmetric: the age gap between gender widened during the nineteenth century because women were the main beneficiaries of a longer life span.[12]

In such circumstances, one may think that men accumulated wealth at quite different rates over time. And that these difference were even more marked for women as they came to live longer and to be no longer excluded from schooling.

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[12] See Appendix 2.

To identify if and to what extent economic environment affected individual savings, we need to distinguish period effects from age effects. One way for that is to follow wealth-age profiles of individuals born in a given period. Figure 4 draws such wealth-age profiles for cohorts of people born in various decades, from 1780-89 to 1850-60.[13] According to the age at death of each individual who died with a positive wealth, we can see how the economic conditions in which they were active impacted on their saving. The curves start at 30 years old. Wealth increases rapidly until the forties, because of dowries and inheritance (the mean age of a person at the death of her ascendant is between 30 and 35 years old, while marriage takes place between 20 and 30). Wealth increases then steadily at a slower pace until the sixties (mainly through savings) and reaches a maximum before declining. Even without correction for mortality ratios, a hump-shaped pattern, characteristic of the lifecycle model, can be seen in our repeated cross-sectional data. However, the hump almost vanishes for individuals who belonged to the top 10% of the wealth distribution (the top decile, shown as p90) whereas it is much more visible for people belonging to the bottom of the distribution: we take here the example of individuals whose wealth is in the third decile (p30).

Moreover, one expects these two different patterns to be most visible for people who saved when the economy was booming. And actually it is precisely what is observed. These two patterns are best illustrated by the situation at death of individuals born in the 1790s or in the 1800s who were thus active during a long period prosperity.

By contrast, the life-cycle evolved differently for those who lived crises or wars. For instance, individuals born in the 1780s whose active life started during the Revolution or its aftermath and stopped before the period of rapid growth did not fare as well as those born in the

next two decades. And individuals who died after the first world war were in a really different situation. This is clear for p30 and foremost for the top ten. The richest are clearly worse off during WW1 and after. We retrieve the stylized fact of a reduction in inequality, as in other countries at the beginning of the twentieth century, a pattern also found by T.Piketty in a recent study on French income data and related to the destruction of capital stock during the war and the subsequent shifts towards a more progressive fiscal system (Piketty 2001).

<Figure 4 about here>

Econometric analysis confirms the illustrative findings (table 3). Age has a positive effect on wealth, but it is not robust through the various specifications (performed here on the sample of asset owners). In the simplest form such as $\log(W_{it}) = b(a_{it})$, the coefficient of age and age squared are strongly significant. The turning point is at 57 years old, lower than for the dichotomous variable (in table 2) of asset ownership and also lower than the average life length. The OLS regression suggests that a decline in the level of wealth should be indeed observed for the elderly. But the significance of the coefficients vanishes when one takes into account the level of initial wealth, which is approximated here by the wealth of one parent (allowing it to be 0 if the parent has left no asset). In another specification where initial wealth is completed by a dummy variable indicating whether the region of residence is characterized by a strong inter-vivos transfers such as dowries (corresponding roughly to the South of France), the age effect becomes significant at a 90 percent confidence level. At this stage therefore, we cannot infer if the consumption behavior is indeed different when one expects some inheritance or if it is simply a problem of misspecification.

Actually, two patterns are emerging. First, as noted before, asset owners are not homogeneous. For the bottom 40 percent, the age is significant and the turning point is at 52

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[13] The profiles are not corrected for differential mortality rates.

years old. For these individuals, the initial wealth does not matter. What counts is the accumulation out of earnings and it is therefore not surprising to see a decline in capital after the end of active life. On the contrary, for those at the top end, inheritance helps but there is neither a rise of wealth with age nor a subsequent decline when old. Second, age is significant (at any level of wealth) for individuals who died before 1850 or after 1914 (at a 90 percent confidence level) but not in between. Moreover, there is again a difference by gender. For men, the age effect is significant at a 90 percent confidence level. For women, it is not.

The last two columns of table 3 show an interesting pattern on married couples. Their probate records are interesting to study because they give some information on the distribution between inheritance and lifetime earnings. Married persons have their assets divided between "community property", which is what the couple earns together and "separate property" that would include everything that the wife (or the husband) had received from her (his) family. The separate property includes dowries and all inheritances or gifts received individually. Therefore, the separate property in a married couple could be seen as a proxy for inheritance and family assets, while the common property could be seen as the result of accumulated savings. Of course, the distinction is not always easy to draw: it is possible that one takes from his separate property and either gives it to his spouse or registers it as a common good. Loans or credit from the community to the separate properties are possible. For example, if one wants to build a house on a piece of land that he owns personally, he can get a loan from the community. Another typical case occurs when an heir pays with the community money the fees and taxes that are due for an

inheritance, that by definition, will be included in his own separate property. All these virtual loans and credits to the community property will be repaid at the time of death. [14]

A reasonable guess would be that each spouse contributes to the community proportionally to his/her separate assets. Taking the husband's loan to the community as a proxy for husband wealth, table 3 shows that a married woman's wealth is best explained by both her parent and her husband's wealth. On the contrary, the wife's asset has no part in explaining married men's wealth. The correlation between the spouses separate properties is quite high however (around 0.63) suggesting the existence of assortative mating. Rather, as a women have fewer ways of accumulating out of her own earnings, her wealth is quite well determined by inheritances of various sorts. Another hint of this phenomenon is that the correlation between parent and child wealth is higher for a daughter than for a boy (0.52 instead of 0.35).

< Table 3 >

Putting together assets owners and non asset owners and allowing for left-censored observations, age matters: total wealth peaks at 63 years, or 59 years when controlled by the initial level of wealth. Alternatively, if the age variable is replaced by the time length between the parent and the child's death, which can account for the time during which the inheritance received provided revenue, wealth peaked some after 28 years after the death of the parent. This figure corresponds indeed roughly to the lag between two generations. However, the time length between the parent and the child death is not significant in regressions performed on positive wealth only.

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[14] When both types of properties are present, the share of separate asset (thus of inheritance) in total wealth is around 30 percent. It starts on average at 12 percent for a total wealth of more than 100F, reaches its maximum (36 percent) for the bracket between 600 and 4000 F then declines to 21 percent for wealth above 15000F (Bourdieu et al., 2000).

A two-step procedure was also performed (table 4). We estimate a two stage model where the first stage estimated the probability that a decedent left a positive bequest and the second stage the size of the bequest. The age variables have the expected signs but is of little significance as soon as initial wealth is added as an explanatory variable for positive wealth. As before, there is a significant difference in the coefficients of age, by gender. The turning point for women is five years earlier than for men, at around 55 years old instead of 60. An interesting point is that the *Rural* variable appears positively in the selection and with the opposite sign in the second step regression: living in a rural area helps to become an asset owner; but conditional on reaching this threshold, those living in the cities are richer. When one does not take into account this twofold effect, the effect of living in rural area on the level of wealth is positive on the whole sample including those with zero assets (table 4), and negative but under-estimated in the sample of strictly positive wealth.

<Table 4>

Two phenomena related to age and gender might explain this contrasted evolution. The first reason comes from changing pattern of retirement, especially for men. As one knows, a new retirement system developed slowly during the period we consider, in particular in the public sector and in large firms with long-term job-attachment. But, whenever it was not yet the case, a wide variety of system existed. On one hand, elderly could be taken care of by family support, public or private local institutions. On the other hand, it was common that middle-aged male workers who faced downward mobility organized various forms of life-cycle savings. In manufacturing, for example, men either unable or unwilling to retire "found an alternative in a partial form of 'on the job retirement'" with downward occupational mobility.[15] Equivalent situations could be found either in the farm sector or in services. In such conditions, workers

might have anticipated the likelihood of reduced incomes much before retreating from their labor participation and all the more so that life expectancy lengthened (albeit slowly for men). One can thus expect that workers have then engaged in a particular form of life-cycle saving – which became unnecessary when a social security system developed.

Next, a change in the distribution of wealth occurred towards women, especially widows. Wealth distribution was initially gender-biased. The problem may have begun early in the life-cycle. In particular, male and female children did not receive the same dowries. Consider farmers, for instance: during the nineteenth and early twentieth century, if the groom's dowry was usually made of livestock and other physical capital coming from the parent's farm, the bride received mostly cash (and/or financial assets) which were used to compensate the groom's brothers and sisters.[16] This composition bias may have resulted in an underestimation of the value of female personal wealth at death : as cash was cash, the wife's estate at death remained equal to the nominal value of the dowry. To the contrary, when her husband was given say a flock, his estate at death included both the flock plus the capital gains from the rapid growth in flock value.

But the male-female difference was more important for inheritance than for inter-vivos transfers. During all the period under survey, the wealth of a given household was legally transmitted to children when the first parent died save for what wealth either parent had reserved as personal property by contract. The one who survived – who was much more frequently female than male -- only received a pension from the late spouse's estate. Indeed, the basic rule was that a widow had only the usufruct: after her husband death, a woman had the legal right of using and enjoying the fruits and profits of (part of) the wealth accumulated by the household: but the wealth itself

[15] Ranson & Sutch (1986:2) discuss the US experience but the problem seems fairly general.
[16] Moriceau (1994: 160-1)

belonged to her children (to avoid the possible translation of the household's wealth toward the widow's family). Actually, there was some legal change improving the rights of the surviving spouse[17], increasing the extent of the usufruct, especially in the absence of children, when the widow was confronted to her in-law relatives.

These slow changes in the legal framework were actually signaling a change of a greater magnitude in women's position in the society. It became more and more common to correct the legal status of the widow by special clauses introduced either in the marriage contracts or, later in the life-cycle, in specific donations between husband and wife. Not only did women have an extended access to the traditional system of family pension. But more often did they receive also the capital stock itself. The widow's portion increased, at the expense of the children's welfare. This shift can be traced back to the early modern period [18] but it dramatically accelerated during the 19th and early twentieth century. As a result women benefited from a spectacular redistribution during this century and a half – perhaps the most spectacular redistribution as Piketty (1999) suggests. The switch from pension to capital could be efficient in a changing environment: entitling widows with property rights on the family capital gave more flexibility to sell the capital if it was devaluated (such as land during the agricultural depression of the 1870s and 1880s). On the contrary, a usufruct was linked to an inalienable asset. To sell it required the approval of the widow and the children. This new role for widows was even more likely with the spread of women's education. Last, as women were living longer they were also more likely (and with the fertility decline this may become important) to inherit including collaterally from aunts or uncles.

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[17] Two laws were particularly important from this point of view, the first in March 1891 and the second in April 1925.
[18] Moriceau (1985)

How this redistribution might be seen in the wealth of deceased people ? First, the usufruct will never appear in the widow's estate (but it will be mentioned in the husband's probate record). So we might miss the increasing usufruct. Second, cash is easier to hide than fixed assets and is likely to be under-declared (though according to contemporaries, fraud was negligible).[19] Women's property might then be under-estimated as long as their property was mostly cash received as a dowry; and they might appear as asset owners when they will get access to their husband's property. In our data, they will thus appear as poor and then richer as more old women manage the family capital. Moreover, the wealth gap between men and women should fall.

<Table 5 > <FIGURE 5>

Table 5 compares married men and women. The mean wealth of married men is significantly higher than for women who died before 1870 but not significantly different thereafter. By deciles, the convergence is most impressive the higher the decile. When restricted to widow versus widower, the wealth gap is even reversed in favor of women. As for the share of asset owners, the secular decrease of the 'rich' people, mentioned in section 1, is seen again in table 5 and is actually more pronounced for women than for men. But, when restricted to widow/ers, the probability of leaving an estate is equivalent for both genders and becomes even higher for women when restricted to persons deceased before 65 (that is, relatively recent widows, that had not the time to consume their estate).

Figure 5 tells the same story graphically. It shows the wealth distribution of men and women by periods of birth. People born in the first decades of the nineteenth century are living through the expansions of the 1830s and 1860s as well as the crisis after 1870. The outcome in

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[19] Sea Appendix 3. Daumard (1973) underscores that fraud was unimportant at least before the reform of 1901, that is precisely the period during which women most often received mere cash.

terms of wealth is mixed: the bottom end of the distribution is poorer while the middle and the top of the distribution is better off, especially for men older than 60 years old. For cohorts born between 1825 and 1850, the striking factor is the enrichment of old women. They are richer for any point in the wealth distribution than previous cohorts, for the same percentage of assets owners. As a result, the wealth distribution of old women converges to that of old men. The difference in wealth between men and women that characterized earlier cohorts is being replaced by an opposition between rich old and poor young.

5. Wealth distribution

Let us see in the last section, how these various effects of age and gender relate to changes in wealth distribution. A previous paper (Bourdieu et al. 2001) showed that wealth inequality in France was high and stable throughout the nineteenth century and that inequality decreased drastically in the first half of the twentieth century, after WW1. In this paper, where we examine the age-wealth relationship on complete birth cohorts, we restrict to individuals born between 1780 and 1850. In other words, wealth distribution indicators are computed by years of birth and not as usual, by years of death. We catch here the first stylized fact, that of a stable and high inequality. Figure 6 shows the wealth inequality between persons born in the same period of time and likely to experience identical economic and political environment. The idea is to compare the opportunities given to different complete cohorts (followed from their early twenties until their death). Nineteenth century France was quite unequal. The figure shows a stable and high Gini coefficient at around 0.8, with a slightly increasing trend. The inequality for people born in the mid nineteenth century is thus higher than for people born fifty years before in the aftermath of the French Revolution. However, when one brings into the picture the share of population that owns no asset at all at the time of death, the overall inequality is now at around 0.9 for the Gini

index and is *increasing* over time, for cohorts born between 1780 and 1860. In other words, although inequality among the rich is stable, the share of rich people in the population is decreasing from over 60 percent for the cohorts born before 1800 to 45 percent for those born after 1850. This dramatic decrease drives wealth inequality up. This phenomenon is overlooked in usual estate duty statistics, because, by definition, they are focusing on those who leave assets behind. Nevertheless, because of the people at the edge of asset ownership, that might cross this threshold during their life-time, it is important to consider the 'zero wealth' state.

<Figure 6>   <Table 6>

Table 6 shows the decomposition of inequality by age and gender. More than half of total inequality is explained by wealth distribution among men for cohorts born at the beginning of the nineteenth century. This high inequality can be related to contrasting valuations of assets when these people were aging in the period of great depression some sixty years later. For later cohorts, however, inequality among women and especially among old women becomes predominant and this seems to us related more to the change in the distribution of control over assets by gender.

The existence of people deprived of the access to property accounts for 20 percent and later 30 percent of total inequality. Even though the share of 'poor' among old women remains constant for cohorts born between 1804 and 1850, the mere increasing importance of this age group results in almost 14 percent of total inequality being explained by the old women without estate. The level of inequality among wealth owners increases among old women for cohorts born after 1825. The latter group is even the only one to experience an increase in wealth inequality. As a result, the differences in wealth for this age group explain 35 percent of total inequality.

As a simple exercise, one might compute what would have been the inequality, had the age structure remained that of the first cohorts of the sample (but with the mean wealth and the intra-strata inequality of the later cohorts). In that case, the overall inequality will be low (the Theil index would be at 1.9) and will come mostly from the old age group (but equally divided between men and women). [20]Of course, this is only a computation keeping other things constant, but it suggests that indeed female aging explained the persistence of high inequality until WW1.

6. Conclusion

Looking at the wealth-age relationship from a long run perspective has numerous advantages. We can observe complete cohorts and assess the impact of demographic changes as well as economic cycles. The source has also some drawbacks, one of the most important being that we capture wealth of decedents, which might be a poor proxy of the total amount of assets enjoyed during lifetime by an individual, or even by members of a same family who would pool their resources together.

Nevertheless, two points can be made. First, the people who have no property at the end of life matters. They are numerous and even steadily growing throughout the nineteenth century's France – at least when the decline in infant mortality is not taken into account - . These persons are interesting because in a way, they are experiencing the pure life-cycle hypothesis, consuming all their earnings. Some of them, those living from public relief or the women, tend to live very long, even longer than asset owners. Therefore, no simple relation that would go from wealth to age can be inferred: the 'rich' indeed do not live always longer than the 'poor'.

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[20] The Theil index of 1.93 would decompose roughly as follows : 1.7 percent for inter-strata inequality, 24 and 7 respectively for rich and poor old age group (same figures for men and women), 7 and 3 for rich and poor young women, 18 and 7 for rich and poor young men.

Next, a gender bias should be taken into account in wealth distribution. French law established an equal sharing of a parent estate among all children. But, actually, inherited assets were gender specific. The situation changed with the population aging, which in nineteenth century France concerned primarily women. I

The hump-shape pattern of wealth-age profiles is verified once small amounts of wealth, or the possibility of moving from assets ownership to no asset at all is taken into account. But for the top of the distribution, life-time accumulation appears not as significant as the mere fact of being a heir. Moreover, the shape of wealth-age profiles changes over time, due to economic fluctuations and aging. In particular, the need to finance longer life length required starting retirement with more wealth; as the elderly were mostly women, this meant a redistribution by gender and age. Women's wealth tended to converge towards men's. A possible explanation would be that widows got more often control over family wealth.

In this first exploration of a new dataset of fiscal records in France, we have worked on the largest possible sample (individuals without their complete genealogies). Still, many questions raised here needs to be answered in a family context. For instance, inheritance and gifts, both from parents and from the spouse, seems determinant for women more than for men, with changes occurring as they are living longer. The question of inherited wealth has then to be addressed also with a long run perspective. Nevertheless, it seems already clear that during the period under survey, both aging and the way families transferred their assets between their members by age and by gender have contributed to the narrowing gender gap.

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Appendix 1 : the dataset

Wealth is defined as the sum of real estate and movable assets reported in the *Table of* Inheritants. After 1880, the *Table* is completed by the *Register*. In the latter, we defined wealth as the sum of bequest amount plus liability (actually liabilities are recorded only after 1901). Values are deflated by a national cost of living index based on 1912-1913[21].

Since public information on land was both ancient and reliable, it is likely that fixed assets were easier to capture than moveable wealth. Very liquid assets could have been easily withdrawn from fiscal scrutiny. The price of land and real estate might also have been understated although some preliminary checks reveal that the evaluation followed the evolution of market prices (albeit with a lag). Third, wealth computed at the time of death could have been cut down by gifts made during lifetime in order to prepare the transmission. This bias should be limited, not least because transmission fees applied also to gifts and were low anyway during the period under survey. A last source of bias that is not controlled for here, may come from the occurrence of a terminal illness that would impoverish people just before death.

Dowries given to children at the time of marriage are an important factor of wealth transmission. Some of them are mentioned in the probate records. It is here taken into account as a regional dummy. Indeed, dowries are far from being of the same nature all over France; in particular, they were much more important in some departments in South-West than elsewhere in France, in relative terms at least.[22]

As explained in the text, the sample of (positive) wealth owners become very scarce due to a disappearance of summary information in the *Table of Inheritants* after 1880. Instead, we have to rely on the *Register of Transfers after Death,* a more detailed source but limited to a smaller and biased sample because of the data collection process. As it is now, information from the *Register* is over-representing certain parts of France, among which, mostly Paris. The primary information of the existence or not of an estate at death is on the contrary available throughout the period. In order to compute statistics, we have reweighted the data for people who died after 1880, in the following way. We have first selected *départements* (counties) that exhibited the same age structure and urbanization rate, and were similar before 1880 in our dataset, as regards the share of people owning an asset at death and the average level of wealth. We also regrouped regions with the same inheritance law under the *Ancien Régime*. Next, each group was considered to be represented by the county for which we had information on wealth after 1880; this 'representative' county was reweighted accordingly. The results of the reweighting process are shown in table A1. A problem still remains : there is a small discrepancy between the sub-sample of persons with positive wealth and those also with positive wealth and whose parent is known. The latter group is more likely to be married, to work in the agriculture sector and to live in a rural area.

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[21] Lévy-Leboyer & Bourguignon (1985) ; Piketty (2001).
[22] Bulletin de statistique et de législation comparée, 1899, vol. 1, pp, 343-69, 432-43.

Table A1 : Weighted and unweighted sample

	Unweighted sample		Weighted sample	
				parent known
All				
Male	0.51	0.57	0.51	0.53
Age	58	53	60	61
Adults				
Age	60	57	61	62
Rural area	0.83	0.78	0.82	0.85
Paris	0.05	0.12	0.05	0.05
not married	0.12	0.15	0.11	0.09
Agriculture	0.61	0.66	0.61	0.73
Public sector	0.04	0.06	0.05	0.06
Number	13147	542		

Wealth levels	Unweighted Sample		Weighted sample	
		Parent known		parent known
Mean	10704	14874	9144	9141
Standard deviation	48967	50747	37334	26251
Comparison statistic				
-weighted vs. unweighted	-1.76			
- all vs. parent known	0.01			
P20	336	614	410	602
P50	1869	2714	2080	2512
P90	17127	28967	17073	22698

Note : Adults : over 20 years old. Wealth levels in 1912 French Francs, for assets owners older than 20 years old and for death year between 1870 and 1940. Comparison statistic : see note, table 5.

Appendix 2

Table A2 : Percentage of deceased by class of age at various dates

	1806	*1886*	*1936*
Women			
Percentage of deceased by class of age :			
Less than 20	*38.3*	*31.1*	*10.9*
20 to 29	*5.6*	*5.7*	*3.4*
30 to 39	*6.8*	*5.9*	*3.7*
40 to 49	*7.7*	*6.3*	*5.5*
50 to 59	*9.6*	*8.6*	*9.0*
60 to 69	*12.9*	*13.7*	*16.5*
70 to 79	*12.6*	*16.8*	*27.0*
80 and more	*6.5*	*11.9*	*24.0*
Men			
Percentage of deceased by class of age :			
Less than 20	*40.6*	*33.2*	*13.0*
20 to 29	*11.8*	*6.1*	*4.0*
30 to 39	*6.6*	*6.1*	*5.5*
40 to 49	*7.1*	*7.1*	*8.4*
50 to 59	*8.6*	*9.4*	*12.9*
60 to 69	*10.5*	*13.6*	*19.5*
70 to 79	*9.8*	*15.6*	*23.3*
80 and more	*4.9*	*9.0*	*13.4*

Appendix 3 :The taxation regimes.

Taxation rates of inheritance are low for direct transmission to children. During the 19th century, they were proportional and increased with the degree of parental link between the heir and the decedent, the spouse being taxed at an intermediate rate. Before 1850, real estate was more taxed (from 1 percent when transmitted to children) than other type of property (0.25). In 1850, this distinction was abolished and the taxes were levied at the same rate for all types of properties. French and foreign public bonds and equities were included in the tax base –they were no obligation of reporting them before - . The tax base extended progressively: it included private bonds (1863, 1871) and life annuities (1875). In 1875, a distinction was introduced in the taxation of real estate between estate used for agricultural production – valued at 25 times the rent – and other estate (private lodging as well as industrial plants) valued at the traditional rate of 20 times the rent. In 1901, the tax schedule became progressive (below 1 million Francs) – and remained proportional above this threshold - .Both the rates and the threshold of 1 million were raised in 1910. As a compensation, starting 1901, liabilities were registered and tax rates were computed on net assets. The general consensus (Daumard 1973) is that fraud was negligible until 1901.

Inheritance tax rates (in percentage)

Beneficiary's Link to the decedent	Wealth of the decedent	Children	Grand-children	Spouse	Family : others	outside family
Year						
1850		1.25		3.75	8.12 - 10.11	11.25
1902	less than 2000F	1		3.75	8.5 – 14	
	2000F-10000F	1.25		4	9 - 14.5	15.5
	10000F -1 MF	1.50-2.50		4.5 - 6.5	4.5 – 17	18
	more than 1 MF	3 - 5		7 - 9	3 - 19.50	15.5 - 20.5
1910						
	less than 2000F	1	1.5	4	10 – 15	18
	2000F-10000F	1.5	2	4.75	10.75 – 16	19
	10000F -1 MF	2 - 4.5	2.5 – 4	5.5 - 8.5	13 – 21	20- 24
	more than 1 MF	5 - 6.5	4.5 -7	9.25 - 12.25	15.25 – 26	25 –29

Note: tax rates in percentage. The definition of family was restricted to the 4th parental degree after 1910. Spouses usually got the use of a share of the decedent's separate property (*usufruct)*, usually ¼ when there were children, ½ if there were siblings or ascendants. They are not considered as heir, unless they receive a specific bequest.

Table 1. Sample Characteristics by wealth categories

| | Poor (Non asset owners) | | Rich (Asset owners) |
| | Col 1 | Col2 | Col 3 |
	No income (pauper)	Other	
Whole sample:			
Male	0.52	0.52	0.52
Age	54	28	59
Adults :			
Age	59	56	61
Residence in Rural area	0.68	0.59	0.82
Residence in Paris	0.01	0.16	0.04
Never married	0.24	0.27	0.11
Agriculture sector	0.41	0.35	0.61
Public sector	0.06	0.06	0.05
N obs	4455	14511	25560

Note : mean of various characteristics. Adults : persons older than 20 years old. Residence : at the time of death.

Table 2 Asset ownership

Sample	all			all					1870-	
		men	women		men	women				
period of death							1800-49	1850-69	1913	1914-40
N obs	36051	18042	17409	17010	10559	6244	10357	6948	12145	6422
pseudo R2	0.025	0.041	0.015	0.200	0.215	0.199	0.022	0.026	0.026	0.033
age	0.0622	0.0620	0.0574	0.0626	0.0597	0.0659	0.0565	0.0568	0.0590	0.0777
	(21.63)	(15.01)	(14.00)	(12.89)	(8.869)	(9.641)	(14.303)	(11.723)	(10.264)	(9.08)
age^2	-0.00049	-0.00045	-0.00049	-0.00047	-0.00042	-0.00055	-0.00045	-0.00044	-0.00044	-0.00062
	(-18.56)	(-11.72)	(-13.07)	(-10.25)	(-6.574)	(-8.753)	(-12.495)	(-9.933)	(-8.51)	(-8.003)
widow/er				-0.196	-0.247	-0.100				
				(-5.19)	(-4.554)	(-1.853)				
Working in agriculture				0.326	0.337	0.290				
				(10.27)	(7.563)	(6.243)				
living in Paris				-0.615	-0.804	-0.872				
				(-9.89)	(-8.395)	(-7.318)				
living in a rural area				0.421	0.425	0.437				
				(9.36)	(7.22)	(6.349)				
handicap				-1.950	-1.938	-1.994				
				(-19.66)	(-14.67)	(-13.821)				
constant	-1.604	-1.741	-1.342	-1.828	-1.852	-1.756	-1.214	-1.260	-1.653	-2.285
	(-22.29)	(-16.87)	(-13.03)	(-14.35)	(-10.58)	(-9.684)	(-12.08)	(-10.35)	(-11.29)	(-10.35)

Note : probit regression on individuals older than 20 years old (weighted sample). Dependent variable is asset ownership. T-student statistic in parenthesis. Handicap : dummy variable indicating a person insane, ill, handicapped or in prison.

Table 3. Determinants of wealth : positive wealth

Sample	all	all	bottom 40%	Top 20%	all
N obs	13147	539	190	180	539
R2	0.008	0.126	0.060	0.068	0.155
Age	0.0617	0.0428	0.0742	0.0297	0.0594
	(6.76)	(1.34)	(1.97)	(1.00)	(1.83)
age^2	-0.00054	-0.00041	-0.00071	-0.00021	-0.00055
	(-6.59)	(-1.37)	(-2.03)	(-0.80)	(-1.84)
parent wealth		0.183	0.037	0.086	0.203
		(6.54)	(1.19)	(2.88)	(7.16)
Dowry					-0.639
					(-2.92)
constant	5.614	5.592	4.145	8.053	5.228
	(23.39)	(6.82)	(4.57)	(9.12)	(6.24)

By period of Death :	1800-49	1850-69	1870-1913	1914-40
N obs	72	94	261	157
R2	0.5147	0.1803	0.1671	0.0885
Age	0.0522	0.0051	0.0440	0.1168
	(2.06)	(0.14)	(1.16)	(1.74)
age^2	-3.83E-05	4.25E-06	-3.96E-04	-1.04E-03
	(-0.09)	(0.01)	(-1.12)	(-1.77)
parent wealth	0.385	0.353	0.205	0.136
	(3.96)	(3.37)	(5.53)	(3.03)
constant	2.842	4.496	5.428	3.772
	(4.21)	(3.53)	(5.68)	(2.01)

Note : Weighted sample. Individuals with positive wealth of over 20 years. Wealth and parent wealth are in logarithms (the log of parent wealth is set to 0 in case of no asset). Student T-statistic in parenthesis. Dowry : dummy variable indicating a regions characterized by a significant amount of dowries and gifts.

Table 3 (continued)

<u>By gender</u>

	all	men	women	all	men	women	married men	married women
N obs	539	289	220	13147	6485	6343	158	99
R2	0.139	0.149	0.127	0.025	0.024	0.021	0.132	0.223
Age	0.0407	0.0894	-0.0112	0.0619	0.0750	0.0465	0.0113	0.0086
	(1.27)	(1.90)	(-0.26)	(6.82)	(5.54)	(3.79)	(0.13)	(0.105)
age^2	-0.00038	-0.00077	0.00004	-0.00053	-0.00063	-0.00043	-0.00003	-0.00024
	(-1.27)	(-1.75)	(0.09)	(-6.56)	(-5.16)	(-3.88)	(-0.05)	(-0.284)
parent wealth	0.185	0.192	0.178				0.171	0.156
	(6.49)	(5.26)	(3.79)				(3.63)	(3.036)
dowry							-0.41	-0.66
							(-1.07)	(-1.462)
rural area	-0.54	-0.53	-0.54	-0.62	-0.54	-0.59		
	(-1.78)	(-1.14)	(-1.17)	(-8.31)	(-4.97)	(-5.18)		
husband/wife wealth							4.67E-06	7.74E-05
							(1.49)	(2.22)
constant	6.066	4.671	7.498	6.087	5.667	6.461	6.473	7.237
	(7.04)	(3.91)	(6.00)	(24.95)	(15.57)	(19.43)	(2.75)	(3.97)

Note : Dowry, rural area : dummy variables indicating a region with significant dowries, a rural area or living in Paris at the time of death. Parent wealth is in logarithm (set to 0 in case of no assets). Husband/wife wealth : amount of common property given to the survivor's separate property as indicated in the estate of a married person. T-statistics in parenthesis.

Table 4. Determinants of wealth : all sample

	all	all	all	men	women	death period 1800-1869	death period 1870-1940
N obs	32123	768	768	406	328	161	607
pseudo R2	0.012	0.0258	0.0217	0.0367	0.0212	0.0536	0.0244
censored obs	18978	229	229	117		28	201
Age	0.538	0.261		0.396	0.148	0.372	0.245
	(32.193)	(5.492)		(5.942)	(2.027)	(4.2)	(4.288)
age^2	-0.00427	-0.00219		-0.00321	-0.00135	-0.00344	-0.00207
	(-28.789)	(-5.285)		(-5.574)	(-2.109)	(-3.968)	(-4.206)
generation lag			0.0504				
			(3.415)				
generation lag^2			-0.0009				
			(-3.983)				
parent wealth		0.305	0.280	0.303	0.320	0.553	0.302
		(8.176)	(7.174)	(6.197)	(5.263)	(5.471)	(7.114)
dowry			0.018				
			(0.065)				
constant	-14.910	-2.274	4.700	-6.345	0.997	-6.609	-1.741
	(-33.289)	(-1.718)	(14.457)	(-3.365)	(0.497)	(-3.063)	(-1.078)

	all	all	men	women	all	men	women
N obs	768	32123	16045	15547	768	406	328
pseudo R2	0.0304	0.0233	0.0321	0.0205	0.0298	0.04	0.026
censored obs	229	18978	9561	9205	229	117	108
age	0.268	0.530	0.555	0.475	0.259	0.391	0.153
	(5.62)	(32.305)	(24.047)	(20.011)	(5.482)	(5.894)	(2.108)
age^2	-0.00228	-0.00429	-0.00417	-0.00415	-0.00220	-0.00321	-0.00139
	(-5.478)	(-29.428)	(-20.292)	(-19.738)	(-5.34)	(-5.598)	(-2.189)
parent wealth	0.305				0.297	0.301	0.295
	(7.805)				(8.016)	(6.183)	(4.841)
dowry	-0.357						
	(-1.263)						
rural area	1.404	4.139	4.383	4.415	1.281	1.226	1.424
	(3.559)	(36.053)	(26.298)	(26.744)	(3.779)	(2.533)	(2.676)
Paris	0.205						
	(0.303)						
constant	-3.416	-17.368	-19.460	-14.960	-3.130	-7.068	-0.151
	(-2.487)	(-38.564)	(-30.562)	(-22.968)	(-2.338)	(-3.712)	(-0.074)

Note : Tobit regression on weighted sample of individuals older than 20 years. T-statistics in parenthesis. Dependent variable : log of wealth (set to 0 in case of no assets). Dowry, rural area and Paris : dummy variables indicating a region with significant dowries, a rural area or living in Paris at the time of death. Parent wealth is in logarithm (set to 0 in case of no assets). Generation lag : number of years between parent death and own's death.

Table 4 . (continued)

Two step regression							
	all	men	women	all	men	women	all
N obs	34842	17071	17190	34842	17071	17190	28632
Censored	23611	11700	11597	23611	11700	11597	28093
log likelihood	-66841	-33270	-32491	-66029	-32835	-32109	-12416
log of wealth							
Age	0.057	0.071	0.041	0.057	0.071	0.0410	0.0372
	(5.65)	(4.641)	(3.088)	(5.672)	(4.662)	(3.093)	(1.175)
age^2	-0.00049	-0.00060	-0.00038	-0.00048	-0.00059	-0.00037	-0.00034
	(-5.465)	(-4.355)	(-3.166)	(-5.384)	(-4.332)	(-3.098)	(-1.145)
Parent wealth							0.180
							(6.596)
Rural area				-1.079	-1.122	-0.984	-1.596
				(-8.163)	(-5.735)	(-4.857)	(-3.05)
Constant	6.819	6.513	7.171	7.629	7.387	7.872	10.686
	(21.194)	(13.549)	(15.872)	(19.961)	(13.514)	(13.862)	(5.584)
Selection							
Widow/er	-0.043	0.005	-0.066	-0.059	-0.020	-0.078	
	(-1.743)	(0.126)	(-1.992)	(-2.38)	(-0.498)	(-2.323)	
Handicap	-1.391	-1.431	-1.349	-1.390	-1.416	-1.356	-1.118
	(-20.142)	(-14.848)	(-13.648)	(-19.254)	(-13.263)	(-13.625)	(-4.903)
Rural area				0.501	0.546	0.507	0.523
				(16.776)	(11.721)	(12.214)	(6.804)
Constant	-0.016	-0.021	-0.011	-0.379	-0.423	-0.380	-1.726
	(-1.135)	(-1.066)	(-0.556)	(-14.1)	(-10.226)	(-9.998)	(-26.227)
Mills ratio	-0.702	-0.756	-0.685	-0.708	-0.776	-0.653	-1.204
	(-5.411)	(-3.865)	(-3.517)	(-5.002)	(-4.003)	(-2.935)	(-3.096)

Note : two-step regression on weighted sample of individuals older than 20. Handicap : see table 2. T-statistics in parenthesis.

Table 5. Gender

Period of death	married men		married women	
	1800-1869	1870-1940	1800-1869	1870-1940
Share of asset owners	73	59	70	55
Age distribution (%)*				
20-54	31	28	33	27
55-64	20	20	17	17
65+	50	53	49	56
Sector of activity				
non agriculture	42	57	59	68
Agriculture	53	32	41	31
Public	5	12	0	1
Participation rate	100	98	91	68
Wealth				
Mean	6735	8705	4513	8374
Standard deviation	30510	32648	20171	28924
Comparison statistics	3.53	0.54		
p20	265	423	227	406
p50	1374	2251	1086	2190
p90	11889	17096	7471	16822

Note : wealth levels in 1912 FF. Weighted sample. The comparison statistics is : $\dfrac{\bar{x}_1-\bar{x}_2}{\sqrt{\dfrac{s_1^2}{n_1}+\dfrac{s_2^2}{n_2}}}$ and follows a

normal distribution, with x,σ and n, respectively the mean, standard deviation and number of observations in each group. The difference in means between men and women's wealth is significant for the first period.

* : Because of rounding, the figures do not sum to 100.

Table 6. A- Primary and secondary inequality by age and gender

Cohort	Born between		
	1780 and 1804	1804 and 1824	1825 and 1850
Gender and age at death			
SHARE of poor			
Women 20-59 yrs old	37.30	39.72	47.85
Women 60 and more	40.59	48.86	48.99
Men 20-59 yrs old	41.66	45.66	53.97
Men 60 and more	33.62	37.47	45.19
THEIL index (asset owners only)			
Women 20-59 yrs old	1.61	1.54	1.02
Women 60 and more	1.65	1.17	1.73
Men 20-59 yrs old	2.02	1.48	1.35
Men 60 and more	1.44	1.96	1.39
THEIL index (all sample)	2.17	2.26	2.25

Table 6. B - Decomposition of inequality (Theil index)

Cohort	Born between		
	1780 and 1804	1804 and 1824	1825 and 1850
Gender and age at death			
THEIL index (total sample)	2.17	2.26	2.25
Of which :			
Share of Inter-group inequality (%)	1.5	1.9	3.1
Share of intra-group inequality (%):			
Among women:			
Aged 20-59 and rich	10.2	9.2	4.1
Aged 20-59 and poor	3.0	3.0	2.6
Aged 60 and more, and rich	20.7	10.6	35.4
Aged 60 and more, and poor	6.5	6.0	13.8
Among men			
Aged 20-59 and rich	23.5	11.4	11.0
Aged 20-59 and poor	6.3	4.7	6.3
Aged 60 and more, and rich	22.3	42.2	16.4
Aged 60 and more, and poor	6.1	10.1	7.1

Note : Theil index is decomposed according to various characteristics. Gender and age decomposition is computed for asset owners aged 20 and more. The share of inter-group inequality is the percentage of total inequality explained by the weighted mean wealth of each group (as a ratio of the mean wealth for the whole sample). shows the decomposition of inequality by age and gender.

Figure 1
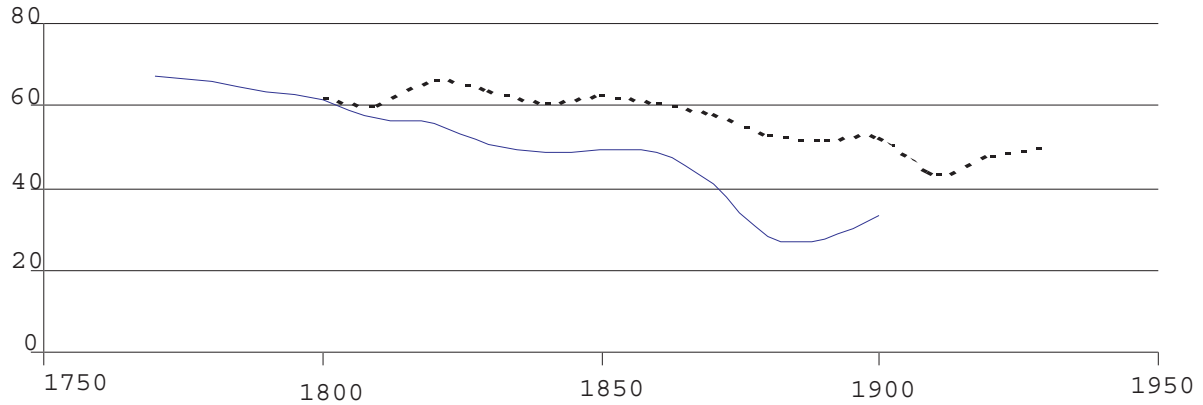
Index of real GDP per capita (1908-12=10

Figure 2

Evolution of the percentage of rich

- - - - - - - % rich dead in a given

———— % rich born in a given decade

Figure 3

Age at death by gender and wealth ownersh:
over 35 years
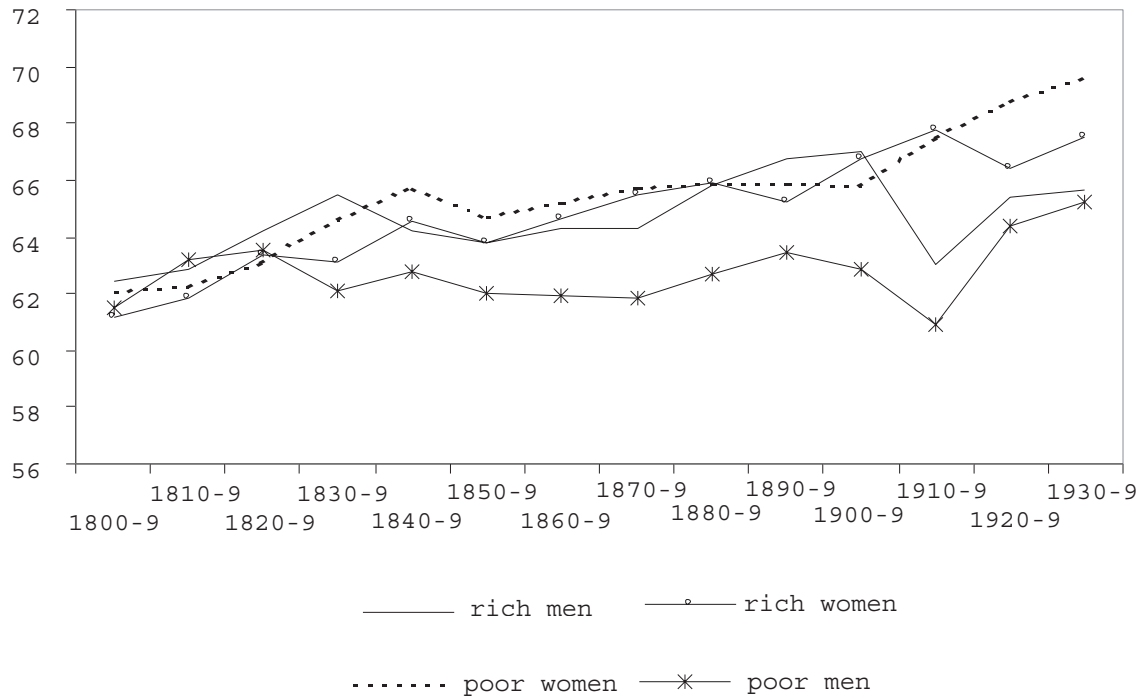

Legend:
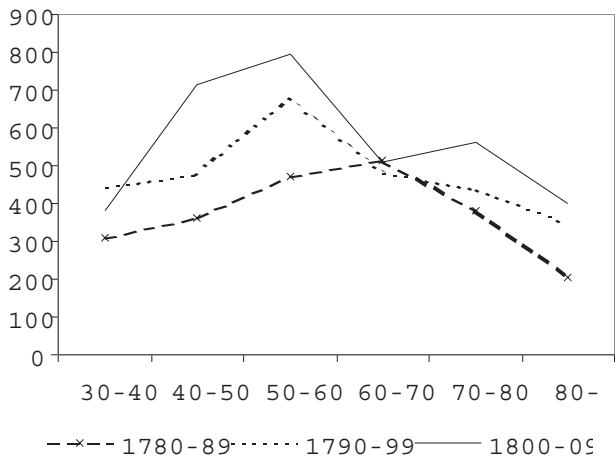——— rich men   —○— rich women

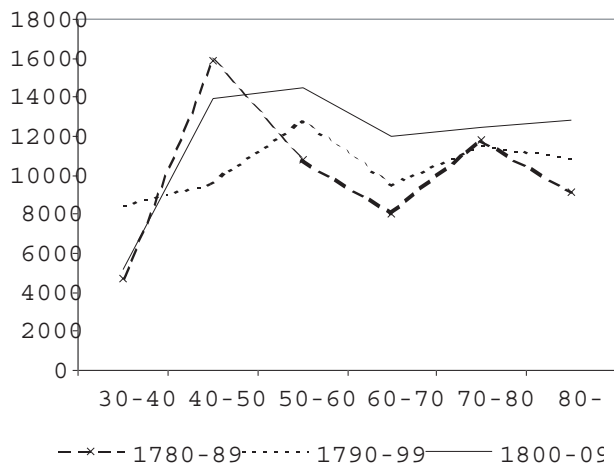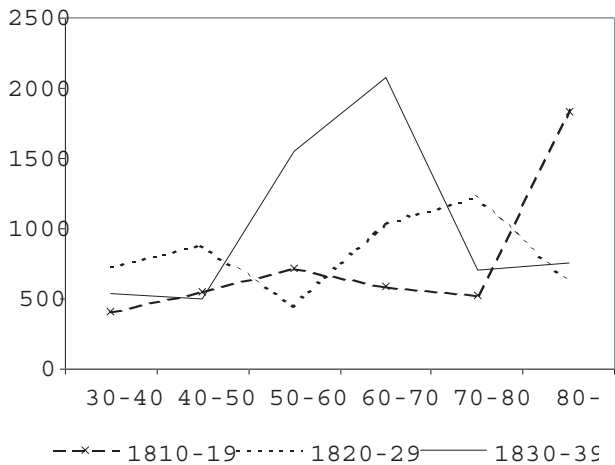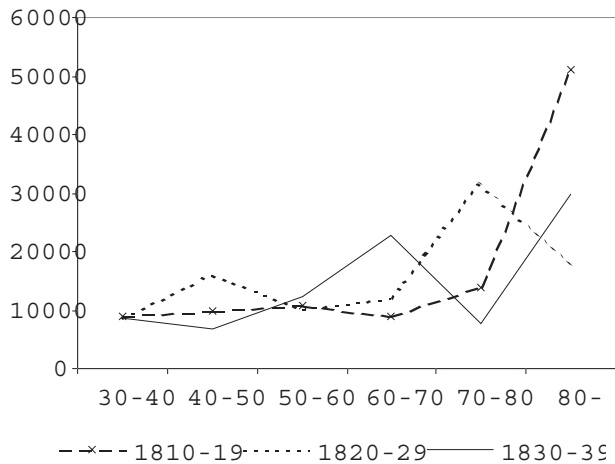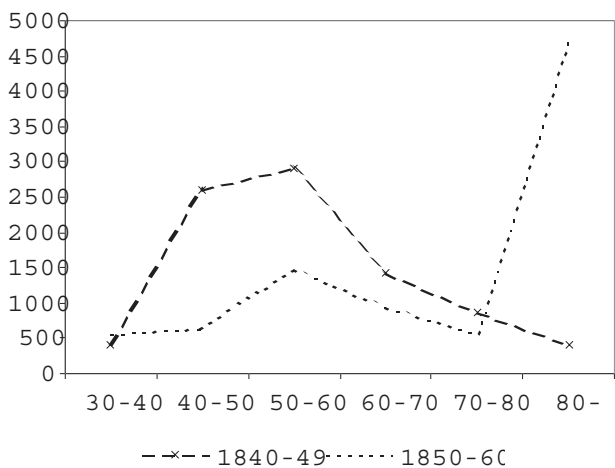······· poor women   —*— poor men

Figure 4

Wealth-age profiles, p30

Wealth-age profiles, p90

Wealth-age profiles, p30

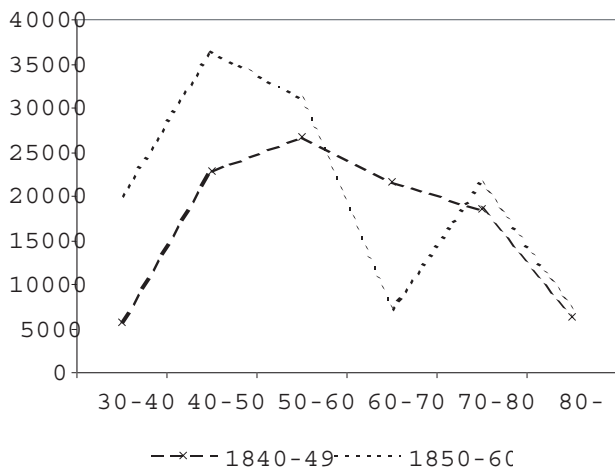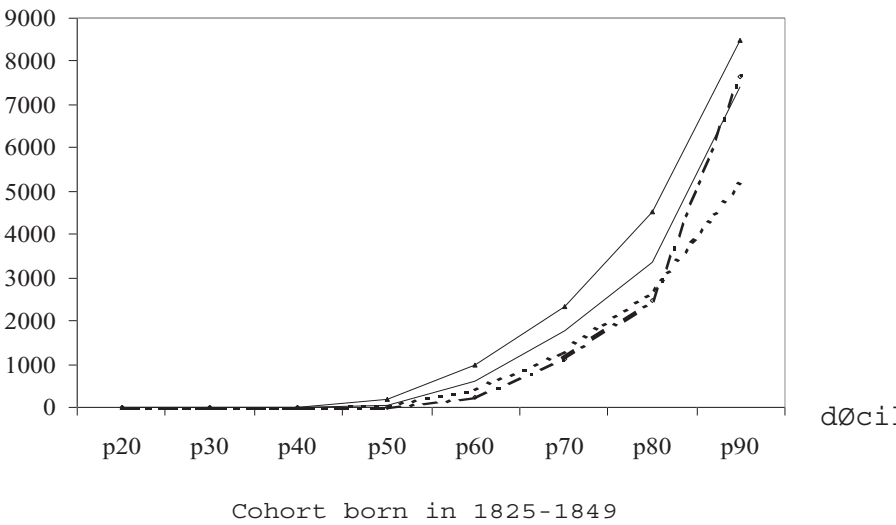Wealth-age profiles, p90
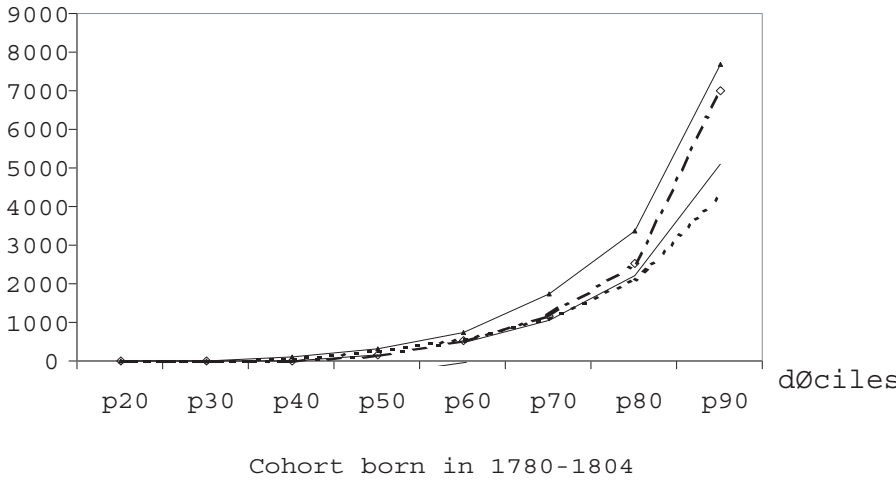
Wealth-age profiles, p30

Wealth-age profiles, p90

Figure 5

Wealth distribution by gender and age

Cohort born in 1780-1804

Cohort born in 1805-1824

Cohort born in 1825-1849

men 20-59 ——————— men 60+

women 20-59 ——————— women 60+

Figure 6

Inequality by decadal cohorts

death cohorts (adults, ie

- — · — · — Gini index on all adults
- · · · · · · Gini index on positiv
- ———— % rich