ESSAYS ON FINANCIAL BEHAVIOUR
OF HOUSEHOLDS AND FIRMS

PROEFSCHRIFT

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1 Introduction

This dissertation aims at empirically analyzing different aspects of the economics and financial behaviour of households and the financial decision making of firms using micro data.

Household choices on saving behaviour as well as labour supply are based on preferences, external factors and exogenous events, both in actual realizations and in expectations. In the first two chapters, we focus on how inheritance expectations and realizations shape economic decisions as well as family dissolution decisions. Receiving an inheritance can be conceived as a plausibly exogenous increase of resources which has, like any windfall gain, an impact on economic decisions, such as consumption/saving and labour supply decisions. Unlike with windfall gains, individuals are likely to form and develop their expectations on receiving an inheritance and on the amount.

In the first study, we investigate whether the expectations on receiving an inheritance act as a driver for economic choices such as accumulation and decumulation of wealth patterns, as well as on willingness to bequeath and labour supply decisions. To do so, we use the DHS dataset from the Netherlands integrated with a module we designed on subjective probabilities of receiving an inheritance in the near future (in the next ten years). In the second study, we focus our attention on the effect of having received an inheritance or an inter-vivos transfer on a more intimate aspect of individuals' lives: *divorcing*. In doing that, we use panel data from the DNB Household Survey between 2002 and 2016. In the third study, we change country of analysis, focusing on the credit access and credit demand of Italian firms using RIL cross-section data of 2015.

In Chapter 2, we investigate whether and to what extent the expectations on receiving an inheritance act as a driver of economic choices; the fact of expecting a wealth endowment in the future should play a relevant role according to life cycle theory, particularly if the expected amount is large. We expect that the perspective of receiving a wealth endowment in the future affects consumption decisions, will make individuals more willing to leave a bequest, and will induce them to imagine themselves not to be part of the labour force at an age close enough to the standard retirement age. In our analysis, we use the DNB Household

Survey (DHS) from the Netherlands, a Dutch panel data set collected by the CentERdata that allows to study both psychological and economic aspects of financial behaviour; since we are interested in questions concerning the probability of receiving an inheritance in the future, we devised a special module asking about subjective probabilities on receiving an inheritance and the amount of this inheritance (in intervals) in the next ten years. Based on these expectations, we analyze whether the expected inheritance acts as a deterrent to saving. Results show that individuals perceive the expected inheritances as a potential increase of personal wealth, which leads to a reduction in savings; moreover, expectations appear to matter also in the enhancement of the intention to bequeath and in work versus leisure choices: indeed, expecting to receive an inheritance increases the chances of leaving a bequest and reduce chances of working at an age of 62 years old (or higher). Eventually, considering the fact that money transfers during an individual's lifetime might shape their behaviour, we drop those who already benefited of a wealth endowment: even without those observations, results are robust and in line with our expectations.

The study in Chapter 3 aims at investigating whether receiving an inheritance or another financial transfer can represent a motivation to increase the chances of getting divorced, using panel data from the DNB Household Survey (DHS) from the Netherlands between 2002 and 2016. As broadly discussed in the literature, different factors may lead toward marriage disruption; at the same time, the role played by inherited wealth, as a fundamental driver in matrimonial strategies, has always represented a very interesting topic. Along this line, starting from the idea that an inheritance receipt might impact various aspects of an individual's life, we estimate a Cox proportional hazard ratios model and test what variables act as drivers in enhancing the chances of withdrawing from the marital union. In particular, we estimate the probability that a married couple divorces and how this probability varies through time, identified by the duration of the marriage, trying to understand the role of inheritance/gift receipt, differentiated between inheritances/gifts received by the husband or the wife, and other covariates that might affect the transition probability. The set of covariates we control for contains, for example, whether the recipient of the inheritance was the

husband or the wife, several dummies for the educational level of the head of the household, personal income of both partners, etc. We also include the difference in educational level between spouses with the aim of capturing the potential importance of bargaining power.

Findings suggest that when the wealth endowment, such as an inheritance or a gift, has been received by the wife, this enhances the chances that separation of the couple will occur. This signals that receiving an inheritance/gift changes the bargaining power in the couple: while for the husband, who probably already was in a predominant position in the household, it does not represent an incentive to divorce, for the wife, results suggest that she may perceive a change in the bargaining power that enhances the chances of marital disruption. We also checked whether the size of the inheritance matters exploiting the amount of the inheritance/gift received. Results confirm previous findings suggesting that, when the inheritance or transfer is received by the wife, divorce is more likely to occur. Presence of child(ren) in the household seems to deter divorce; indeed, it appears to act as "glue" for the marriage reducing the chances of separation.

Starting from the interesting results pointed out in the previous chapter, the issue arises that also in different domains, there may be gender differences in money management and wealth endowment can lead toward an increase of the bargaining power for the "female counterpart", probably related to the fact that women are often excluded from the labour market and are not in a predominant position in the household. Over the years, this situation has created disadvantages for women, even when they participate in the labour market; along this line, we will analyze gender differences in the credit market for Italian women- and men-led firms.

Hence, in Chapter 4, the analysis focuses on the credit access and credit demand of Italian firms using RIL data, a sample of the Employer and Employee Survey (RIL) conducted by INAPP (previously ISFOL) in 2015. The RIL is a nationally representative sample of over 24,000 partnership and limited companies, operating in the non-agricultural private sector in Italy. The RIL contains a rich set of information about personnel organisation, industrial relations, and other workplace characteristics. With regard to the sample selection, we only

consider 'active' firms, meaning that we exclude wound-up firms or bankrupt firms, with a final sample of 29,789 observations. This sample allows us to better control for size effects and check if the opt-out phenomenon is still discernible in large companies when the person in charge for strategic decision-making is a woman.

We investigate whether the gender of the decision-maker of the firm affects the demand for credit. Access to credit by women is a crucially debated issue, as women appear to be more disadvantaged in getting a loan than men, without exhibiting additional riskiness with respect to the male counterparts, as was recently shown by Alesina et al. (2013) on overdraft credit to micro-firms and the self-employed in Italy. In the current paper, we investigate both dimensions, exploiting the information available in the dataset, of asking for a loan in a given year and being successful in obtaining it - i.e., whether the loan was approved. We control for the characteristics of the women or men leading the company, looking in particular at education level and age. We expect the culture-determined reluctance towards loan application to be negatively correlated to education. As for the age, we expect younger women to approach bank financing more similarly to men. Finally, we include regional dummies to capture any local difference in credit offer, macroeconomic environment, and intensity of gender bias.

Our results, robust to different specifications, show that a gender-detrimental effect is found at a significant level only for credit demand; in particular, it appears that women-led firms have two percentage points lower probability of asking for credit than men-led firms. On the other hand, we find no significant evidence that credit approval is negatively affected by the gender of the firm manager. Results also hold when we allow for selection in having asked for credit, which could be responsible for a self-selection channel through which only good debtors ask for credit.

All chapters of this dissertation are self-contained. They have their own introductions and appendices (directly reported after each paper). The bibliography containing the references to all papers can be found at the end of this dissertation.

2 Subjective Inheritance Expectations and Economic Outcomes

Joint with Maria Cristina Rossi, and Arthur van Soest

2.1 Introduction

A large strand of literature has focused on the effect of unexpected income receipt and windfall gains on consumption and saving decisions. The economic rationale, following the life cycle/permanent income hypothesis (Deaton et al., 2002), suggests that households should just react to unexpected shocks in income and wealth, while expected shocks are already incorporated in the optimal consumption and saving pattern. Thus, the timing of expected income receipt should not matter for consumption decisions. Based on these theoretical implications, the empirical literature has considered both expected and unexpected income/wealth changes to test whether the theoretical implications hold and under what circumstances (see Borella et al. (2009), Garcia et al. (1997)). Wealth changes and their impact on consumption choices have been studied in several ways, e.g., with reference to real estate wealth change (Calcagno et al., 2009) including inheritance receipt and its impact on labour supply (see Brown et al. (2010)). However, as an inheritance does not come as a shock for many of the receivers, little is known about expectations on inheritance and their impact on economic choices.

Inheritance can be conceived as "unearned income" which should affect earnings, consumption, savings, and other economic outcomes (Imbens et al., 2001): Brown et al. (2010) use inheritance receipt as a wealth shock and find that it is associated with a significant increase in the probability of retirement, especially when the inheritance is unexpected. Along this line, inheritance, like any other form of unearned income, will likely have an effect on household decisions such as the amount of time devoted to leisure/work and consumption.

The role of wealth in modelling labour decisions has been broadly considered (see Krueger & Pischke (1991), Brown et al. (2010), Bloemen & Stancanelli (2001) on early retirement,

Bloemen & Stancanelli (2001) on labour market participation and Imbens et al. (2001), Henley (2004) on hours worked); however, subjective expectations on bequests can also act as a possible engine driving labour market and savings intentions; along this line, an inheritance might, for example, affect labour supply (Joulfaian & Wilhelm, 1994): indeed, Bloemen & Stancanelli (2001) found that wealth has a significantly positive impact on the reservation wage and a negative impact on the employment probability – higher levels of wealth result in higher reservation wages and higher reservation wages are associated with a lower employment probability. Recent evidence focuses on the effect of receiving an inheritance on the Labour Force Participation (LFP) in married couples: bequests might, indeed, act as trigger in increasing the bargaining power of the recipient affecting his/her LFP, providing new evidence on the ability of spouses to commit to a fully efficient allocation of resources within the household (Blau & Goodstein, 2016). Bequests represent a component of wealth: Joulfaian (2006) finds that wealth increases by only a fraction of the inheritances received, and implies a marginal propensity to consume significantly higher than that predicted within the perfect foresight or consumption smoothing frameworks.

In the literature, there have also been many findings on the intention to bequeath: recent ones discuss different assumptions concerning household preferences and show that these assumptions have varying implications for bequest motives and bequest division from an inter-country difference point of view (Horioka, 2014). Concerning the relationship between actual inheritances and economic decisions, there is some evidence on the effect of receiving an inheritance on economic behaviour (Brown et al., 2010). Indeed, along this line, another link to be taken into account is between inheritances and bequests; recent findings suggest that the experience of inheriting can enhance the intention to bequeath (Stark & Nicinska, 2015).

While the literature on the intention to bequeath is rich, little has been written on inheritance expectations and current economic behaviour. Horioka et al. (2003) explore the channel linking bequest expectations and saving behaviour and find a negative effect: The higher the expectation of leaving a bequest, the lower is the decumulation pace.

There is also some evidence on the effect of an actual inheritance on economic behaviour, rather than an expected inheritance (Brown et al., 2010).

Since we are dealing with the literature of the life cycle model, which assumes that individuals plan their consumption and savings behaviour over the life cycle, we start from the idea that events that are going to happen in the future should affect current individuals' lifestyle and behaviour.

The role of expectations has been widely considered in the economic literature, as an important driver shaping economic and financial decisions. Expectations on a future inheritance could represent an important factor affecting labour outcomes as well as saving choices. To the best of our knowledge, little evidence still has been found on the possible link between inheritance expectations and individuals' economic behaviours. This constitutes one of the main reasons why this paper aims at studying whether subjective expectations of receiving an inheritance in the future can, in some way, affect financial decisions. The degree of uncertainty surrounding the size and timing of the receipt of inheritances may influence the pattern of life cycle saving (Weil, 1996). Expecting a wealth endowment in the future (compared to already having received it) should then play a relevant role in shaping the behaviour of people, particularly if the amount is large. Large inheritances might lead to a decline both in labour force participation and savings (Joulfaian, 2006).

We contribute to the literature by analysing the relationship between inheritance expectations and different economic outcomes (such as savings). We are interested in how current financial and working decisions are the consequence of expecting an inheritance in the future. Indeed, as the title of this work suggests, we are interested in observing different financial and working decisions that, according to the life cycle model, should be a consequence of expecting an inheritance in the future: in particular, we focus our attention on savings, the propensity of bequeathing, and the work versus leisure decision.

We expect that the perspective of receiving a wealth endowment in the future should positively affect current consumption decisions, should lead individuals to be more willing to leave a bequest, and might induce them to imagine themselves not to be part of the labour

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force at an age close enough to the standard retirement age. Our empirical methodology will involve the use of the DNB Household Survey (DHS), a Dutch panel data set collected by the CentERdata that allows to study both psychological and economic aspects of financial behaviour. This panel survey was launched in 1993 and comprises information on work, pensions, housing, mortgages, income, possessions, loans, health, economic and psychological concepts, and personal characteristics. This data set is particularly suited for our analysis since it includes many questions about sources of income the respondents may have, it contains very detailed information on assets, liabilities and mortgages; since we are interested in questions concerning the probability of receiving an inheritance in the future, we devised a special module which comprehends questions that enrich the DHS data set with new information on inheritance expectations.

The direct measurement of expectations has developed since the early 1990s, as expectations are a key interest in intertemporal economic models and measuring expectations is useful to avoid making strong assumptions (Manski (2002), Manski (2004)); along this line, the measurement of expectations in terms of probabilities has become very important in economics. Elicitation of probabilistic expectations has several desirable features, such as ease of interpretation, ability to characterize uncertainty, possibility of exploiting the algebra of probability to check the internal consistency of a respondent's elicited expectations about different events, and interpersonal comparability allowing to reach conclusions about the correspondance between subjective beliefs and "frequentist realities" (Dominitz (1998), Dominitz & Manski (1997), Manski (2004)). Along this line, with the aim of understanding economic behaviour, validity may be defined by the correspondence between survey reports of expectations and the actual subjective expectations which determine individual behaviour; as said in Dominitz (1998), it is unreasonable and unnecessary to hope for perfect correspondence. Often, in the absence of expectations data, researchers are left to infer expectations from realizations. Conversely, having at their own disposal individuals' expectations, De Bresser & van Soest (2015) analyze the determinants of satisfaction with various dimensions of pension arrangements, emphasizing the role of subjective expectations

regarding retirement income; their main focus was the validity of subjective expectations elicited through probabilistic measures and the causal impact of expectations on well-being. Indeed, analysing the predictive power of expectations can provide insights into the validity of expectations data; even if it is not possible to verify whether reported probabilities reflect the actual beliefs held by respondents, it might be possible to assess the internal consistency and plausibility of responses: evidence suggests that responses have such "face validity" when the questions concern well-defined events that are relevant to respondents' lives (Manski (2004)). In doing so, De Bresser & van Soest (2015) apply two different methods to construct subjective replacement rate distributions from the reported probabilities. The first, proposed in Dominitz & Manski (1997), fits an assumed underlying (log-normal) distribution for each observation by minimizing the squared difference between the probabilities implied by the assumed distribution and those reported in the data; the second approach, adapted from Bellemare et al. (2012), uses spline interpolation to fit a subjective distribution that passes through the points corresponding to the probabilities reported by the respondents. The latter is a non-parametric procedure, in the sense that it does not assume any parametric form of the underlying distribution.

Talking about expectations, it might be relevant to refer to the widespread literature on survival expectations which can be in some way related to inheritance expectations as well. Individuals' expectations about their chances of survival to older ages are a crucial component in a range of economic decisions such as how to save for retirement and how to spend savings once retired that are of increasing significance as individuals are given more responsibility for and control over their retirement provision (O'Dea et al. (2018), O'Donnell et al. (2008)). Previous research indicates that subjective expectations correlate with background characteristics in plausible ways (Manski, 2004) and the validity of expectations data has been established in this way mainly for conceptually straightforward examples such as individual mortality (van Santen et al., 2012); indeed, younger cohorts and women underestimate their chances of a long life more than older cohorts and men (e.g., Hamermesh (1985); Wenglert & Rosen (2000); Hurd & McGarry (2002); Banks et al. (2004); Gan et

al. (2005); Elder (2013); O'Donnell et al. (2008); Teppa & Lafourcade (2013); Kutlu-Koc & Kalwij (2017)).

Possible concerns about endogeneity might arise when considering subjective expectations, since expectations could be correlated with relevant background variables that are unobserved to the researcher.
Unlike De Bresser & van Soest (2015), we cannot control for fixed effects to take away a large part of this concern. We therefore cannot prove that the effect we find is causal. Still, we think it is plausible that subjective inheritance has a causal impact on individuals' behaviour: indeed, our results show that individuals perceive the expected inheritances as a potential increase of personal wealth which leads to a reduction in savings; moreover, expectations seem to matter also in the enhancement of the intention to bequeath and in work vs. leisure choices: indeed, expecting to receive an inheritance increases the chances of leaving a bequest and reduce chances of working at an age of 62 years old (or higher). Eventually, results are robust and in line with our expectations, even when dropping individuals who already benefited of a wealth endowment, i.e., individuals whose propensity of saving might have already been shaped through previous money transfers.

Information on inheritances and gifts taxation in the Netherlands In the Netherlands gifts and inheritances are subject to different principles depending also for example on the "intergenerational relationship" between the provider of the gift/inheritance and the recipient. Since we are dealing with inheritance expectations, it might be valuable to illustrate how the taxation and exemption concerning inheritance and gifts work in the Netherlands. One of the most glaring aspects which comes to mind when talking about a donation or an inheritance is related to paying taxes; however, according to the *Belastingdienst*, the Dutch Tax and Customs Administration, there are some exemptions depending on the amount of the gift/inheritance and also depending on the relationship with the donor: for example, in 2016, the maximum amount of a donation from a parent to her son, daughter or foster child exempts up to about 53,000 euros once in the life of a child; along this line, it is also possible to make a donation to a child of about 5,300 euros exempt from tax in each

calendar year. In Appendix 2.7, we report all details concerning exemptions and tax rates on donations and inheritances.

The rest of the paper is arranged as follows: Section 2.2 and Section 2.3 describe the data and the empirical methodology, in Section 2.4 we perform and show some robustness checks and extension of our analysis, Section 2.5 concludes the paper.

2.2   Data

The empirical analysis involves the use of the DNB Household Survey (DHS), a Dutch panel study collected by the CentERdata, a survey agency at Tilburg University[1] specialized in Internet surveys, that allows to study both psychological and economic aspects of financial behaviour; this panel survey was launched in 1993 and comprises information on work and pensions, accommodation and mortgages, income and health, assets and liabilities, economic and psychological concepts. The questionnaires are sent to the respondents via Internet, the respondents fill in the questionnaires at their home computers, and then answers are sent back in the same way: this implies that the questionnaires are self-administered and individuals can answer at the most comfortable time for them. It is important to notice that the selection of panel members of the survey is not dependent on access to Internet: indeed, households without a computer or an internet connection are provided with the necessary equipment.

2.2.1   Inheritance Expectations

The data set is particularly suited for our analysis since it includes many questions about sources of income assets, liabilities and mortgages the household may have. In addition, since we were interested in questions concerning the probability of receiving inheritance in the future period, we devised a special module which comprehends few questions that enrich the data set with new information on inheritance expectations.

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[1]See https://www.centerdata.nl/en

This questionnaire was fielded from 25 November to 29 November 2016. The overall response rate was 83.8% (2,196 out of 2,621 respondents). We merge our module on inheritance expectations with the 2016 assets and liabilities questionnaire and the economic and psychological concepts from DHS.

It is important to say that we allow for continuous responses (i.e., the choice of the chance of receiving an inheritance) instead of a binary (yes/no) variable; we think that in this way responses will be more accurate, since individuals are in some way forced to reflect more deeply on the question. Furthermore, as reported in Manski (2004) if people can express their expectations in probabilistic form, elicitation of subjective probability distributions should have compelling advantages relative to verbal questioning. Probability provides a well-defined absolute numerical scale for responses; hence, there is reason to think that responses may be also interpersonally comparable.

The wording of the four subjective probability questions on the inheritance is given below.

Questions from the module on inheritance expectations

Q1. How likely is it that you will receive an inheritance in the **next 10 years**? [*if Q1 > 0 then go to Q2*]

Q2. And how likely is that you will receive an inheritance of **more than 10,000 euros** in the **next 10 years**? [*if Q2 > 0 then go to Q3.*]

Q3. And how likely is that you will receive an inheritance of **more than 25,000 euros** in the **next 10 years**? [*if Q3 > 0 then go to Q4.*]

Q4. And how likely is that you will receive an inheritance of **more than 50,000 euros** in the **next 10 years**?

Fill a percentage here from 0 to 100 percent. For example, if you are certain that you will receive an inheritance in the next 10 years, then enter 100%. But if there is still a small chance that you will not receive it, then you enter 97% or less. If you are fully convinced that you will receive no inheritance in the next 10 years, enter 0%. But if there is still a small chance that you will receive it, then you enter for example 3 percent or something more. And

if you think the odds are about half, then you fill in 50%, or slightly more or less if that fits better with what you think.

In principle, question $Q2$ is asked only if the answer to question $Q1$ is positive, and the same logic applies to the subsequent questions ($Q3$ and $Q4$). The following figures (*Fig.2.1a - Fig.2.1d*) present the distributions of the subjective inheritance expectations. About half of the respondents report a zero probability of receiving any inheritance. As often with subjective probability questions, there is some bunching at 50% and at other round numbers (10%, 20%, etc.) but this does not seem to be excessive. Kleinjans & van Soest (2014) show that these features do not affect the determinants of (retirement) expectations.

Among those who report a non-zero probability of receiving an inheritance, a large minority is certain that the amount will be lower than €10,000 (Figure 2.1b). Similarly, many respondents indicate that their inheritance will always be lower than €25,000 or €50,000.

Figure 2.1: Subjective inheritance expectations in 10 years
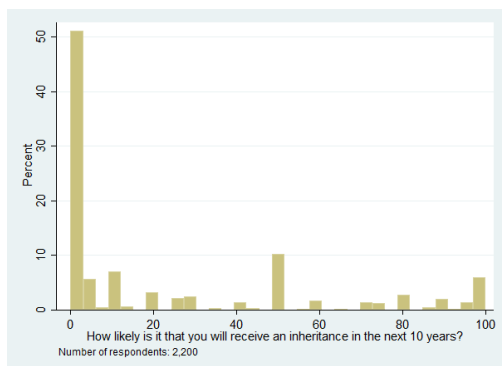
(a) Expected Inheritance
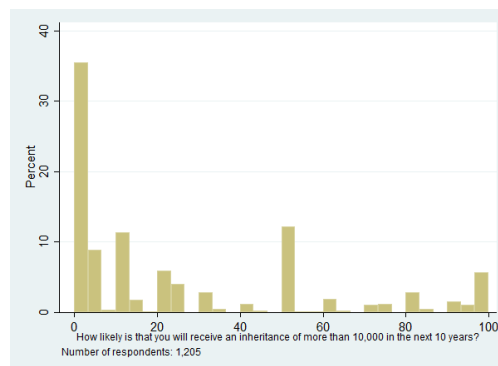
(b) Expected Inheritance greater than 10,000€
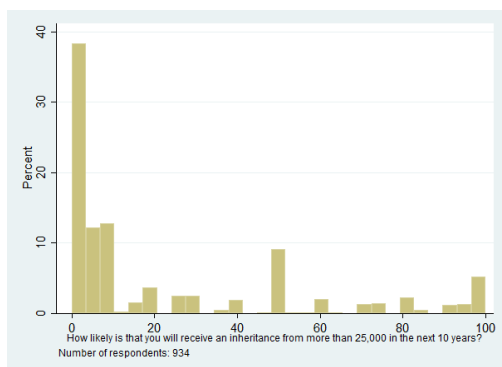
(c) Expected Inheritance greater than 25,000€
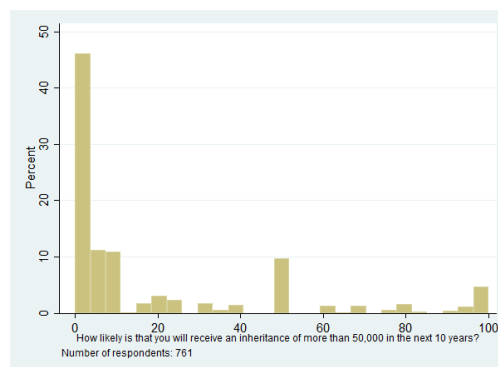
(d) Expected Inheritance greater than 50,000€

Are the Expectations Responses Coherent?

Willingness to answer the questions does not necessarily imply that the responses are meaningful; indeed, one possible problem with this probabilistic approach in submitting these questions might be related to "anchoring" problems, implying that respondents' beliefs are influenced by the wording, order, and context of the questions (Morgan et al., 1992). Suppose, for example, that a respondent expects her/his chances of receiving an inheritance greater than 50,000 euros; then, by firstly asking the probability of receiving an inheritance greater than €10,000, the respondent may be influenced to think that this amount is objectively reasonable and may therefore report a higher probability than believed a priori (Dominitz & Manski, 1997). At this point, it seems useful to attempt to understand if respondents report their expectations coherently.

Response Rates and Consistency of Probabilities   The special module on inheritance expectations has been submitted to 2,621 household members from the CentER panel: among those, 421 individuals do not answer to the questionnaire, 2,196 complete it, and 4 respondents start but do not complete the survey. The overall response rate is 83,8%. Analysing the obtained answers, it is interesting to report that 992 individuals report to have zero chances of receiving an inheritance, 271 have no chance of receiving an inheritance greater than €10,000, 172 have zero chance of an inheritance greater than €25,000 and 166 report a zero probability of getting an inheritance greater than €50,000.

According to the literature, two common fears are generally associated with probabilistic questions, namely, non-response and focal points (e.g., answering 0 percent, 50 percent, or 100 percent). Kleinjans & van Soest (2014) show that these features do not affect the determinants of (retirement) expectations but that individuals round off probabilities instead. Going through the reported probabilities, it is interesting to notice that 197 members report the same probability values at all four questions about chances of receiving inheritances: among those, 175 individuals report the same probability value different from 0 or 100 per-

Table 2.1: Response Rates

	Number of Respondents	Response Rate (%)
Expected inheritance	2,196	83.78
Expected inheritance > 10k	1,205	45.97
Expected inheritance > 25k	934	35.63
Expected inheritance > 50k	761	29.03

The number of respondents report individuals who answer the module we submitted; the response rate is computed on the whole sample to whom the module has been handed in (2,621 individuals).

cent chance; there are 45 cases in which individuals always report a probability of 50 percent and 22 cases in which the probability of receiving an inheritance for all four cases is always 100 percent[2].

Another check is considering whether the reported probabilities obey the logical rule that they should be non-increasing: our data show that the rate of inconsistency is very low, around 2% out of the whole sample; to be more precise, just 46 individuals out of the 2,196 who answer our questionnaire report non-increasing probabilities.

Along this line, it can be possible to assess the internal consistency and plausibility of responses. So, next step concerns the validity of subjective expectations elicited through the probabilistic measures and the causal impact of expectations on well-being; focusing on the predictive power of expectations can provide consistency of the probabilistic measures and give insights into the validity of expectations data.

To do so, we follow the approach proposed by De Bresser & van Soest (2015) who perform two different methods to build subjective distributions from reported probabilities: the parametric one proposed in Dominitz & Manski (1997) and the non-parametric approach of Bellemare et al. (2012); in Appendix 2.8, we show the implementation details and descriptive statistics for the parametric approach comparing them with the reported probabilities of our survey.

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[2] For all these cases, we run again the regressions dropping these observations; results stay the same except the probability of receiving an inheritance greater than €25,000. Moreover, simply excluding these observations when analyzing the determinants of the subjective replacement rate or subjective uncertainty as is commonly done in other papers (Dominitz & Manski, 2006), can therefore result in endogenous sample selection and bias the parameter estimates (van Santen et al., 2012).

Descriptive Evidence on Inheritance Expectations Data

Here, we report how the chances of receiving an inheritance look like among different age categories; it appears that among people between 45 and 54 years old the probabilities of receiving an inheritance in the next years are higher compared to the other categories; this evidence seems reasonable since individuals in that age category, identifying those with older (grand)parents, could represent the ones with more "solid" and relatively well formed inheritance expectations.

Table 2.2: Mean chances of receiving an inheritance by age categories

Age categories	Chances bequest	Chances inh> 10k	Chances inh> 25k	Chances inh> 50k
16-34 years	22.93	13.48	12.35	10.56
35-44 years	31.46	24.00	19.55	16.22
45-54 years	38.57	37.48	32.21	25.34
55 years and older	14.31	26.33	26.74	24.89
Total	21.72	25.48	23.22	19.65

The table reports the means of chances of receiving an inheritance in all four cases. Statistics are weighted by sample weights.

At this point of the analysis, it seems interesting to understand what the determinants of the probabilities of receiving an inheritance are. We therefore perform a Tobit regression explaining each of the inheritance probabilities, with left censoring of zero values. The possible determinants we consider are individual socio-demographics such as gender, age, educational level, income and wealth[3] measures (the latter two in logarithmic form); the results are presented in Table 2.3. Female has a negative but insignificant effect, education appears to matter (low educated have low expectations compared to those with university education, which is the reference category). Wealth has a positive impact on inheritance expectations; furthermore, focusing on the bottom part of Table 2.3, it is interesting to notice that being retired has a negative impact on inheritance expectations, as well as declaring not to have received allowances during childhood or adolescence; it seems plausible that people less used to dealing with financial concepts have lower inheritance expectations.

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[3] Net worth computed taking into account all types of private savings and investment accounts, housing wealth, other real estate and durable goods net of mortgages and other financial debt.

Moreover, we analyze the possible correlation with self-reported survival expectations and self-reported health information[4] and we see that there is a weak and negative correlation between inheritance expectation and health status (individuals who state to have poor levels of health have lower inheritance expectations). Individuals who have lower survival expectations[5] also appear to have lower inheritance expectations.

Our analysis focuses on the effect of probability of receiving an inheritance on savings; it should be emphasized that consumption cannot be estimated since in the DHS dataset there is no information concerning consumption; thus, next section focuses on the construction of the main variable reporting savings.

2.2.2 Savings Measure

In order to construct a reliable measure for savings, we try to combine the traditional approach in the literature (i.e., approximating savings as the difference between financial assets across years) and a different approach proposed by Alessie & Teppa (2010) in which they exploit different questions concerning saving behaviours and expenditures habits present in the DHS dataset. In constructing the delta in financial assets between 2015 and 2016, we have used information about wealth; we took the most liquid assets (checking accounts, savings or deposit accounts, deposit books, savings certificates, savings arrangements) and subtracted the most liquid liabilities (private loans, extended lines of credit).

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[4] "In general, would you say your health is: 1 excellent, 2 good, 3 fair, 4 not so good, 5 poor".

[5] In the DHS, there are some questions concerning life-expectancy and are to be answered by respondents under the age of 90. In particular, we focus our attention on three of them:

- How likely is it that you will attain at least the age of 65? (KANS0)

- How likely is it that you will attain at least the age of 75? (KANS1a)

- How likely is it that you will attain at least the age of 80? (KANS2a)

KANS0 is presented to people aged 16 thru 55, KANS1a is presented to people aged 16 thru 65, KANS2a is presented to people aged 16 thru 70.
For all cases, respondents have to indicate her/his answer on a scale of 0 thru 10, where 0 means "no chance at all" and 10 means "absolutely certain".

Table 2.3: Determinants of Subjective Inheritance Expectations

	Chances inherit	Chances inherit >10k	Chances inherit >25k	Chances inherit >50k
Female	-0.0280	-0.0644	-0.0206	-0.0163
	(0.0384)	(0.0403)	(0.0417)	(0.0453)
Age	-0.0048***	-0.0028	-0.0020	-0.0015
	(0.0017)	(0.0018)	(0.0019)	(0.0020)
Income(log)	0.1049***	0.0794***	0.0833***	0.0697**
	(0.0263)	(0.0275)	(0.0292)	(0.0315)
Wealth(log)	0.0063	0.0099*	0.0120**	0.0127**
	(0.0050)	(0.0052)	(0.0055)	(0.0060)
Educational Levels				
Primary	-0.1006	-0.2259	-0.1661	-0.1903
	(0.1242)	(0.1372)	(0.1407)	(0.1586)
Lower Vocational	-0.1401**	-0.1990***	-0.2511***	-0.2928***
	(0.0587)	(0.0617)	(0.0654)	(0.0745)
Intermediate General	0.0503	-0.0399	-0.0474	-0.0264
	(0.0693)	(0.0724)	(0.0751)	(0.0800)
Intermediate Vocational	-0.0264	-0.0371	-0.0615	-0.0722
	(0.0530)	(0.0541)	(0.0555)	(0.0598)
Higher Vocational	-0.0710	-0.1298**	-0.1107**	-0.1077*
	(0.0497)	(0.0511)	(0.0520)	(0.0561)
Retired	-0.2805***	-0.2842***	-0.2786***	-0.2928***
	(0.0519)	(0.0557)	(0.0589)	(0.0663)
Single	-0.0894**	-0.1230***	-0.1234**	-0.1207**
	(0.0442)	(0.0470)	(0.0486)	(0.0532)
Child(ren)	-0.0340	-0.1047*	-0.0987*	-0.1011
	(0.0540)	(0.0566)	(0.0579)	(0.0631)
No Money Support to Child	-0.0481	-0.0077	-0.0482	-0.0513
	(0.0454)	(0.0480)	(0.0497)	(0.0547)
No Allowance as Child	-0.0665*	-0.1671***	-0.1665***	-0.1877***
	(0.0393)	(0.0424)	(0.0448)	(0.0504)
No SaveTeach as Child	-0.1176**	-0.0597	-0.0371	-0.0338
	(0.0499)	(0.0530)	(0.0555)	(0.0619)
Left-censored Observations	426	552	620	702
Uncensored Observations	537	411	343	261
Observations	963	963	963	963

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Hence, following the Alessie & Teppa (2010) way of dealing with the proxy for savings, we firstly use the information about whether any money has been put aside in the previous 12 months; in the case in which there is an assertive answer, individuals are asked to report the amount saved in the same period. Therefore, for those who stated to put aside money, if the change in financial wealth corresponds to the class of money put aside then savings are set equal to the change in the financial wealth; in the opposite case, if the change in financial wealth does not correspond to the class of money put aside then savings are set equal to the midpoints[6] for each class of the variable reporting the amount of money put aside.

Table 2.4: Did your household put any money aside in the past 12 months?

	Freq.	Percent	Cum.
Yes	1,476	70.35	70.35
No	622	29.65	100.00
Total	2,098	100.00	

Secondly, for those who declare to not having put any money aside, we cross this information with another question present in the survey, i.e., *"Over the past 12 months, would you say the expenditures of your household were higher than the income of the household, about equal to the income of the household, or lower than the income of the household?"*.

Table 2.5: Expenditure trends over the past 12 months

	Freq.	Percent	Cum.
Higher than the hh income	332	15.82	15.82
Almost equal to the hh income	969	46.19	62.01
Lower than the hh income	797	37.99	100.00
Total		2,098	100.00

So, for those who asserted to have put no money aside and whose expenditures were equal to the income of the household, we set zero as the amount of savings (meaning that they did not save as well as not dissaved); for those who claimed to have put no money

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[6] Following the approach proposed in the paper by Alessie & Teppa (2010), since respondents report the amount of money put aside in classes, we constructed the variable by taking the midpoints for each class.

aside and whose expenditures were higher than the income of the household, we set the (negative) delta of financial wealth signalling that they dissaved; eventually, for those who claimed to have put no money aside but whose expenditures were lower than the income of the household, we set the (positive) delta of financial wealth (meaning that they saved). Figure 2.2 reports the distribution of the savings variable we constructed.
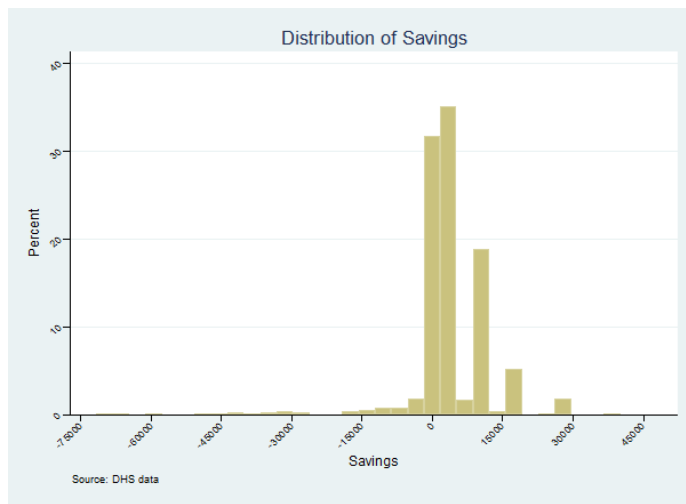
Figure 2.2: Savings Distribution

2.3   Empirical Analysis

The empirical strategy focuses on the effect of probability of receiving an inheritance on savings:

$$Y_i = \alpha + \beta * prob\_inh_i{}^* + \gamma * X_i + \epsilon_i$$

where Y_i, our dependent variable, identifies the savings while X_i collects all demographic and socio-economic control variables such as gender, age, income, level of education, etc partially presented in Section 2.2. It should be emphasized that in the control variables we

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* This variable identifies four different cases:

- Chances of receiving an inheritance in next ten years
- Chances of receiving an inheritance greater than €10,000 in next ten years
- Chances of receiving an inheritance greater than €25,000 in next ten years
- Chances of receiving an inheritance greater than €50,000 in next ten years

also include three controls which capture personal characteristics, which might in some way shape individuals' saving behaviour, such as for example not planning to give large amounts of money to child(ren) or other information concerning attitudes towards lack of receiving allowances or teaching of putting money away as child(ren).

2.3.1 Probit Estimation

At this point, to understand whether inheritance expectations increases/decreases chances of saving or not, we built the dependent variable of our model, i.e., the variable reporting *savings*[7], as a dummy variable which takes value of 1 if savings are positive and 0 otherwise.

Results from Probit model are presented in Table 2.6: the sign of the coefficients related to the probability of receiving an inheritance leads toward the direction that we expected; moreover, coefficients related to inheritance expectations appear to have a negative and statistically significant impact on probability of saving: in particular, they range from 9 to around 13 percentage points decrease in saving. It is worth noticing that there seems to be a gender effect suggesting that women have around 5 percentage points higher probability of saving than men, signalling that women tend to save more compared to men: this might be due to the more conservative and less-risky attitudes of female individuals which can lead toward saving. Along this line, Seguino & Floro (2003) argue that increases in women's wages as well as increases in their share of income lead to higher rates of aggregate saving; this can be due to the different propensities to save probably related to variations in external factors that affect saving behaviours. Concerning the variable about the single status, which identifies a one component household without children, it can make sense to think that a *single* might lean to dissave compared to someone that lives with a partner/spouse or someone with children. Another interesting result is related to the variable reporting the intention of giving money support to child(ren): it appears that those who do not intend to

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[7] Using the savings variable in its original form and running an OLS regression, results show a negative but insignificant relationship between the main variables of interest. We also create an indicator variable on the basis of the qualitative questions present in the survey (to be more precise, an indicator variable which takes value of 1 whether the individuals states to have put money aside in the past or whether the individuals states to have had lower expenditures in the past): also in this case, results suggest a negative effect on the propensity toward saving but coefficients are not statistically significant.

give support to their own children have around 7 percentage points lower probability than those who are willing to financially support child(ren) suggesting that they tend to spend more (maybe for themselves) and, as a consequence, save less. Moreover, there is a negative effect due to the fact of not having being taught as child toward putting some money away (i.e., saving).

2.3.2 Ordered Probit Estimation

Eventually, exploiting the possibility of differentiating between those who dissave, neither dissave or save, and those who save, we construct our dependent variable reporting savings in the household as a three categories variable[8].

Table 2.7: New specification of dependent variable reporting saving behaviour

Saving, no savings or dissaving	Mean savings	Frequency in percentage values
Dissave	-9937.85	9.78
Neither save or dissave	0	18.96
Save	6137.39	71.26
Total	3401.20	100.00

The table reports the new specification of dependent variable reporting saving behaviour. Statistics are weighted by sample weights.

Results with Ordered Probit confirm once again the negative sign obtained both with the previous specification (see Tables 2.8 and 2.9). Coefficients related to inheritance expectations are statistically significant. In general, all results lead toward the same direction across the different models and specification; it might be worth focusing on the income effect: results seem to be in line with the literature stating that propensity to save and to consume differ substantially across income groups and that high-income households save a greater fraction of income than low-income households (Dynan et al. (2004), Fan (2006) and Huggett & Ventura (2000)).

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[8] This variable takes *value 1* if savings are below zero (dissaving), *value 2* if savings are exactly equal to zero, *value 3* if savings are greater than zero (saving).

Table 2.6: Impact of Inheritance Expectations on Saving - Probit Regression

	Dependent Variable: Saving==1			
Probability Inheritance	-0.1093***			
	(0.0350)			
Probability Inheritance 10k		-0.1266***		
		(0.0422)		
Probability Inheritance 25k			-0.0912*	
			(0.0481)	
Probability Inheritance 50k				-0.1105**
				(0.0550)
Female	0.0481*	0.0490**	0.0505**	0.0507**
	(0.0246)	(0.0246)	(0.0246)	(0.0246)
Age	-0.0041***	-0.0039***	-0.0039***	-0.0039***
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Income(log)	0.0508***	0.0492***	0.0479***	0.0476***
	(0.0134)	(0.0134)	(0.0134)	(0.0133)
Educational Levels				
Primary	-0.0202	-0.0259	-0.0168	-0.0168
	(0.0718)	(0.0726)	(0.0707)	(0.0707)
Lower Vocational	-0.0478	-0.0529	-0.0474	-0.0472
	(0.0438)	(0.0439)	(0.0436)	(0.0437)
Intermediate General	-0.0152	-0.0208	-0.0174	-0.0175
	(0.0491)	(0.0496)	(0.0493)	(0.0494)
Intermediate Vocational	-0.0402	-0.0435	-0.0416	-0.0424
	(0.0430)	(0.0432)	(0.0431)	(0.0432)
Higher Vocational	-0.0651	-0.0698*	-0.0640	-0.0639
	(0.0418)	(0.0419)	(0.0416)	(0.0417)
Retired	0.0181	0.0181	0.0242	0.0250
	(0.0306)	(0.0306)	(0.0303)	(0.0303)
Single	-0.0860***	-0.0860**	-0.0833**	-0.0829**
	(0.0332)	(0.0334)	(0.0333)	(0.0333)
Child(ren)	0.0304	0.0320	0.0335	0.0334
	(0.0406)	(0.0409)	(0.0411)	(0.0411)
No Money Support to Child	-0.0710**	-0.0725**	-0.0728**	-0.0724**
	(0.0311)	(0.0311)	(0.0313)	(0.0312)
No Allowance as Child	-0.0203	-0.0247	-0.0208	-0.0206
	(0.0253)	(0.0256)	(0.0255)	(0.0254)
No SaveTeach as Child	-0.0765**	-0.0733**	-0.0724**	-0.0716**
	(0.0351)	(0.0349)	(0.0348)	(0.0348)
Observations	1250	1250	1250	1250

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.9 reports the marginal effects considering as outcome the three different cases which we specified at the beginning of this section (i.e., dissaving, neither saving or dissaving, and saving). Since coefficients appear to be in line with the previous specification and exploiting the possibility of differentiating between the different three categories by which we construct the new dependent variable, in Table 2.9, we report the marginal effects of inheritance expectations: it is interesting to notice for example that an increase in probability of receiving an inheritance lead to a 5 percentage points higher probability of dissaving.

In the analysis so far we included one of the four subjective inheritance probabilities at the time as an explanatory variable. Including all four of them at the same time gives imprecise and insignificant estimates, due to multicollinearity (results not presented). Instead, following Dominitz & Manski (1997), we used the four probabilities to estimate each respondent's complete subjective distribution and used the mean and variance of this distribution as regressors. See Appendix 2.8 for details. The results are presented in Table 2.10. They are again in line with the previous ones, showing a negative and statistically significant relationship between mean individual probabilities and propensity toward saving. We find no significant effect of the subjective variance.

2.4 Robustness Check and Extensions of the Analysis

2.4.1 Money Transfer during Lifetime Could Shape Individuals' Behaviour?

As discussed in the introduction of this work, in the Netherlands gifts and inheritances are subject to different principles depending also for example on the "intergenerational relationship" between the provider of the gift/inheritance and the recipient. Just as reminder, gifts to children are exempt up to an amount of €5,304 (for 2016) per annum; gifts to other parties are exempt up to an amount of €2,122 (for 2016) per annum. As a consequence, it is reasonable to suppose that individuals might have already received gifts/inheritance during their lives. This fact could cause two effects: first of all, individuals are in some way "prepared" to the concept of receiving a gift or an inheritance at some point of their life; secondly, the propensity of saving might be shaped through these money transfers.

Table 2.8: Impact of Inheritance Expectations on Saving - Ordered Probit Regression

	Dependent Variable: Probability of Saving			
Probability Inheritance	-0.3756***			
	(0.1250)			
Probability Inheritance 10k		-0.4736***		
		(0.1540)		
Probability Inheritance 25k			-0.3662**	
			(0.1776)	
Probability Inheritance 50k				-0.4013**
				(0.2006)
Female	0.1379	0.1406	0.1458	0.1458
	(0.0919)	(0.0922)	(0.0917)	(0.0917)
Age	-0.0163***	-0.0154***	-0.0153***	-0.0153***
	(0.0042)	(0.0043)	(0.0042)	(0.0042)
Income(log)	0.1514***	0.1463***	0.1418***	0.1394***
	(0.0417)	(0.0417)	(0.0414)	(0.0414)
Educational Levels				
Primary	-0.1132	-0.1372	-0.1054	-0.1028
	(0.2502)	(0.2493)	(0.2477)	(0.2478)
Lower Vocational	-0.1559	-0.1772	-0.1591	-0.1553
	(0.1471)	(0.1466)	(0.1454)	(0.1462)
Intermediate General	-0.0732	-0.0951	-0.0827	-0.0830
	(0.1739)	(0.1735)	(0.1731)	(0.1734)
Intermediate Vocational	-0.1590	-0.1737	-0.1680	-0.1687
	(0.1484)	(0.1482)	(0.1477)	(0.1481)
Higher Vocational	-0.2362*	-0.2559*	-0.2356*	-0.2338*
	(0.1401)	(0.1398)	(0.1388)	(0.1394)
Retired	0.1339	0.1272	0.1471	0.1534
	(0.1155)	(0.1162)	(0.1151)	(0.1150)
Single	-0.2423**	-0.2444**	-0.2360**	-0.2327**
	(0.1047)	(0.1052)	(0.1049)	(0.1045)
Child(ren)	0.1312	0.1365	0.1415	0.1423
	(0.1429)	(0.1436)	(0.1435)	(0.1432)
No Money Support to Child	-0.2808**	-0.2868**	-0.2874**	-0.2853**
	(0.1165)	(0.1170)	(0.1170)	(0.1164)
No Allowance as Child	-0.1062	-0.1243	-0.1103	-0.1080
	(0.0901)	(0.0903)	(0.0901)	(0.0900)
No SaveTeach as Child	-0.2280**	-0.2210**	-0.2177**	-0.2145**
	(0.1060)	(0.1058)	(0.1056)	(0.1055)
Observations	1250	1250	1250	1250

Coefficients reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.9: Marginal Effects of Inheritance Expectations from Ordered Probit Regression

Outcome Variable: Dissaving				
Probability Inheritance	0.0462***			
	(0.0156)			
Probability Inheritance 10k		0.0582***		
		(0.0193)		
Probability Inheritance 25k			0.0454**	
			(0.0223)	
Probability Inheritance 50k				0.0498**
				(0.0251)
Outcome Variable: Neither Saving or Dissaving				
Probability Inheritance	0.0537***			
	(0.0183)			
Probability Inheritance 10k		0.0679***		
		(0.0225)		
Probability Inheritance 25k			0.0524**	
			(0.0255)	
Probability Inheritance 50k				0.0574**
				(0.0289)
Outcome Variable: Saving				
Probability Inheritance	-0.0999***			
	(0.0332)			
Probability Inheritance 10k		-0.1260***		
		(0.0409)		
Probability Inheritance 25k			-0.0978**	
			(0.0474)	
Probability Inheritance 50k				-0.1072**
				(0.0535)
Observations	1250	1250	1250	1250

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.10: Impact of Mean and Variance of Inheritance Expectations on Saving

	Dependent Variable: Probability of Saving
Mean Subjective Expectations	-0.1266**
	(0.0547)
Variance Subjective Expectations	-0.4356
	(0.2921)
Female	0.0485**
	(0.0246)
Age	-0.0040***
	(0.0011)
Income(log)	0.0511***
	(0.0134)
Educational Levels	
Primary	-0.0046
	(0.0691)
Lower Vocational	-0.0321
	(0.0439)
Intermediate Vocational	-0.0226
	(0.0444)
Higher Vocational	-0.0493
	(0.0443)
University	0.0171
	(0.0451)
Retired	0.0167
	(0.0307)
Single	-0.0870***
	(0.0333)
Child(ren)	0.0298
	(0.0406)
No Money Support to Child	-0.0702**
	(0.0311)
No Allowance as Child	-0.0219
	(0.0255)
No SaveTeach as Child	-0.0762**
	(0.0351)
Observations	1250

Marginal effects reported. Standard errors in parentheses. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

In order to analyze, whether the results might be in some way driven by those who already received an inheritance or a gift, we conduct a robustness check dropping those who already benefited of a wealth endowment. To do so, the model of reference is the same (i.e., our dependent variable is the three-categories variable reporting savings and the main regressors are the same as before). Table 2.11 shows results from Probit model without individuals who benefited from a wealth endowment in the previous year: signs and statistical significance of the coefficients related to inheritance expectations are confirmed; marginal effects of inheritance expectations appear to be a little bit higher than results obtained without dropping those who already received an inheritance.

It might be interesting to notice the effect related to the variables capturing personal characteristics such as not planning to give large amounts of money to child(ren) or not being taught to save during childhood: it seems that individuals who did not receive any teaching in saving money or (almost) never receive an allowance as child show higher probabilities of dissaving compared to the excluded categories who experienced that type of practice.

2.4.2 Extensions of the Analysis

As anticipated in the introduction of this work, the analysis conducted so far aims at contributing to the understanding of the dynamics of wealth distribution, intergenerational transmission of income and wealth dispersion. Along this line, what we want to do in this section is considering other economic outcomes, different from savings, which should be affected as well by the formation of positive inheritance expectations in the future: a first link that is worth to be considered is the one between inheritances (specifically expected inheritances) and bequests; thereafter, we will also take into account the effect on the choice of work versus leisure.

Table 2.11: Impact of Inheritance Expectations on Saving Without Those who Already Received an Inheritance

	Dependent Variable: Saving==1			
Probability Inheritance	-0.1203***			
	(0.0377)			
Probability Inheritance 10k		-0.1345***		
		(0.0461)		
Probability Inheritance 25k			-0.0955*	
			(0.0527)	
Probability Inheritance 50k				-0.1129*
				(0.0614)
Female	0.0456*	0.0465*	0.0477*	0.0475*
	(0.0256)	(0.0257)	(0.0257)	(0.0257)
Age	-0.0040***	-0.0038***	-0.0037***	-0.0037***
	(0.0012)	(0.0012)	(0.0011)	(0.0011)
Income(log)	0.0480***	0.0461***	0.0450***	0.0445***
	(0.0140)	(0.0140)	(0.0139)	(0.0139)
Educational Levels				
Primary	-0.0326	-0.0370	-0.0270	-0.0268
	(0.0772)	(0.0776)	(0.0756)	(0.0755)
Lower Vocational	-0.0632	-0.0675	-0.0611	-0.0606
	(0.0471)	(0.0472)	(0.0468)	(0.0468)
Intermediate General	-0.0329	-0.0389	-0.0348	-0.0354
	(0.0540)	(0.0546)	(0.0542)	(0.0543)
Intermediate Vocational	-0.0463	-0.0503	-0.0477	-0.0477
	(0.0460)	(0.0463)	(0.0462)	(0.0462)
Higher Vocational	-0.0770*	-0.0813*	-0.0744*	-0.0742*
	(0.0450)	(0.0451)	(0.0447)	(0.0447)
Retired	0.0169	0.0185	0.0247	0.0258
	(0.0322)	(0.0320)	(0.0318)	(0.0317)
Single	-0.0891***	-0.0889**	-0.0858**	-0.0849**
	(0.0345)	(0.0347)	(0.0346)	(0.0345)
Child(ren)	0.0274	0.0307	0.0322	0.0315
	(0.0424)	(0.0428)	(0.0430)	(0.0430)
No Money Support to Child	-0.0642**	-0.0663**	-0.0667**	-0.0659**
	(0.0325)	(0.0326)	(0.0327)	(0.0326)
No Allowance as Child	-0.0201	-0.0248	-0.0204	-0.0205
	(0.0264)	(0.0267)	(0.0265)	(0.0265)
No SaveTeach as Child	-0.0786**	-0.0751**	-0.0749**	-0.0741**
	(0.0360)	(0.0358)	(0.0358)	(0.0357)
Observations	1183	1183	1183	1183

Marginal effects reported. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Can Expecting an Inheritance Have an Impact on Individuals' Willingness to Leave Bequests?

As reported in the work by Stark & Nicinska (2015), it is reasonable to expect that the receipt of an inheritance will create an environment that is conducive to making bequests, such that bequeathing will correlate positively with inheriting. However, the argument could also run in the opposite direction: people who did not receive an inheritance and who found it difficult to get on in life without the support provided by an inheritance will not want their children to be subjected to a similar experience, assuming, of course, that people are altruistic towards their children.

The experience of inheriting can enhance the intention to bequeath (Stark & Nicinska (2015)); in the same way, also expectation of inheriting can have a positive impact on the intention to bequeath. For this reason, we exploit the question reporting the chances of leaving an inheritance as new dependent variable of our model. In order to see if there is effectively a relationship between expecting an inheritance and being inclined to bequeath, we consider, as done in the previous specifications, as main explanatory variables of interest our four probabilities of receiving an inheritance.

Results, reported in Table 2.12, suggest that expecting to receive an inheritance might increase the chances of leaving a bequest: in particular, an increase in the probability of receiving an inheritance lead to around 13-15 percentage points increase in the willingness to bequeath; other interesting results come to light from this analysis: income plays a role, indeed it is reasonable to imagine that rich households might be the one who are going to perform a higher chances of leaving a bequest to their relatives; another noticeable result comes from being a single household, indeed being alone in the household might imply lower probabilities of bequeathing to someone. Of course, when analysing these results, it has to be taken into account that willingness to bequeath can be related to unobservable family norms about bequest which also affect inheritance expectations. Indeed, Wilhelm (1996) assumes that parents suffer from a fixed psychic cost if they deviate from equal division of post mortem bequests, while Laitner (1997) writes that social norms may explain why

intergenerational transfers are equally divided between siblings; in families where parents think leaving an inheritance is the norm, children could think the same. In such families, parents will more often leave a bequest, and children will expect to do the same.

Can Expecting an Inheritance Have an Impact on Working at 62 years old?

The effect of wealth on labour market behaviour has been broadly considered in the literature (Doorley & Pestel, 2016); wealth endowment might model labour decisions (see Krueger & Pischke (1991), Brown et al. (2010), Bloemen & Stancanelli (2001) on early retirement, Bloemen & Stancanelli (2001) on labour market participation and Imbens et al. (2001), Henley (2004) on hours worked). Inheritance, like any other asset, might, for example, affect labour supply (Joulfaian & Wilhelm, 1994): indeed, Bloemen & Stancanelli (2001) found wealth to have a significantly positive impact on the reservation wage and a negative impact on the employment probability. Therefore, individual's labour market behaviour may be expected to react to a wealth shock: along this line, inheritance will likely have an effect on household decisions such as the amount of time devoted to leisure/work and consumption. Also, wage expectations, for example, influence occupational and intertemporal labour supply decisions as well as consumption and savings decisions: indeed, Dominitz (1998) analyzes the cross-sectional variation in expectations, revisions of expectations between the spring and the fall of 1993, and the relationship between 1993 expectations and the distribution of spring 1994 earnings realizations. Thence, it seems reasonable to think that expecting an inheritance might also shape choices related to labour decisions as well as saving choices. So, exploiting the question reporting the chances of working at an age greater or equal to 62 years old and using it as dependent variable of this model, we run a last regression (results are reported in Table 2.13) considering as main explanatory variables inheritance expectations: coefficients are negative and statistically significant, suggesting that the chances of working at an age of 62 years old or higher for people who expect an inheritance receiving are lower compared to those who do not have positive inheritance expectations; an interesting result worthy of a specific attention is for example the one gender specific: women seem to show lower chances

of working and this can be related to the low female labour market participation.

2.5 Final Remarks

In this paper we investigate whether and to what extent expecting an inheritance acts as driver in economic choices; in particular, we focus on the effect on savings and on the intention to bequeath. In doing so, we use a Dutch dataset integrated with a specific module that we designed on reporting subjective probabilities on receiving an inheritance and the relative amount (in intervals) in the next ten years.

Results show that individuals perceive the expected inheritances as a potential increase of personal wealth which leads to a reduction in savings; moreover, expectations seem to matter also in the enhancement of the intention to bequeath: indeed, expecting to receive an inheritance increases the chances of leaving a bequest. Eventually, considering the fact that money transfers during an individual's lifetime might shape her behaviour, we drop those who already benefited of a wealth endowment: even without those observations, results are robust and in line with our expectations. We are aware that this work has several limitations that should be kept in mind when considering the results: there might be problems of endogeneity which might be related to unobservable features of parents (e.g., propensity to save, health status, age, economic situation, etc.) that might shape inheritance expectations; however, we contribute to the literature by proposing a new source of analysing the relationship between bequests and savings. Future research is needed to deeply study this link and maybe extend it taking into account other financial aspects such as debts, equity, investments, etc.

Table 2.12: Impact of Inheritance Expectations on Intention to Bequeath

	Dependent Variable: Willingness to Bequeath			
Probability Inheritance	0.129***			
	(0.029)			
Probability Inheritance 10k		0.135***		
		(0.035)		
Probability Inheritance 25k			0.160***	
			(0.039)	
Probability Inheritance 50k				0.154***
				(0.045)
Female	0.0055	0.0046	0.0019	0.0022
	(0.020)	(0.020)	(0.020)	(0.020)
Age	-0.0034***	-0.0037***	-0.0037***	-0.0037***
	(0.001)	(0.001)	(0.001)	(0.001)
Income(log)	0.0445***	0.0467***	0.0467***	0.0479***
	(0.013)	(0.013)	(0.013)	(0.013)
Educational Levels				
Primary	0.127*	0.128*	0.126*	0.125*
	(0.065)	(0.065)	(0.065)	(0.065)
Lower Vocational	0.0342	0.0329	0.0357	0.0335
	(0.037)	(0.037)	(0.037)	(0.037)
Intermediate Vocational	0.0016	-0.0012	0.0026	0.0031
	(0.035)	(0.035)	(0.035)	(0.035)
Higher Vocational	0.0887**	0.0870**	0.0872**	0.0869**
	(0.035)	(0.034)	(0.034)	(0.035)
University	0.138***	0.133***	0.136***	0.137***
	(0.037)	(0.036)	(0.036)	(0.037)
Retired	0.176***	0.173***	0.173***	0.168***
	(0.028)	(0.028)	(0.028)	(0.028)
Single	-0.0747***	-0.0745***	-0.0735***	-0.0758***
	(0.025)	(0.025)	(0.025)	(0.025)
Child(ren)	0.165***	0.165***	0.165***	0.165***
	(0.028)	(0.028)	(0.028)	(0.028)
No Money Support to Child	-0.193***	-0.192***	-0.190***	-0.192***
	(0.023)	(0.022)	(0.022)	(0.022)
No Allowance as Child	-0.0055	-0.0019	-0.0027	-0.0042
	(0.022)	(0.022)	(0.022)	(0.022)
No SaveTeach as Child	-0.0993***	-0.103***	-0.103***	-0.104***
	(0.026)	(0.027)	(0.027)	(0.027)
Observations	1250	1250	1250	1250

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2.13: Impact of Inheritance Expectations on Probability of Working

	Dependent Variable: Probability of Working			
Probability Inheritance	-0.0699			
	(0.051)			
Probability Inheritance 10k		-0.0737		
		(0.058)		
Probability Inheritance 25k			-0.155**	
			(0.061)	
Probability Inheritance 50k				-0.187***
				(0.069)
Female	-0.278***	-0.278***	-0.276***	-0.275***
	(0.034)	(0.034)	(0.034)	(0.034)
Age	-0.0068***	-0.0067***	-0.0064***	-0.0066***
	(0.002)	(0.002)	(0.002)	(0.002)
Income(log)	0.0595**	0.0594**	0.0610**	0.0608**
	(0.024)	(0.025)	(0.024)	(0.024)
Educational Levels				
Primary	-0.336***	-0.346***	-0.359***	-0.359***
	(0.097)	(0.098)	(0.099)	(0.099)
Lower Vocational	0.0184	0.0209	0.0112	0.0128
	(0.073)	(0.073)	(0.073)	(0.072)
Intermediate Vocational	-0.0562	-0.0536	-0.0584	-0.0626
	(0.065)	(0.065)	(0.065)	(0.065)
Higher Vocational	0.0025	0.0035	-0.0004	-0.0037
	(0.064)	(0.065)	(0.065)	(0.065)
University	-0.0188	-0.0155	-0.0178	-0.0220
	(0.068)	(0.069)	(0.069)	(0.069)
Retired	-0.464***	-0.457***	-0.459***	-0.450***
	(0.087)	(0.086)	(0.084)	(0.083)
Single	-0.0024	-0.0020	-0.0078	-0.0063
	(0.045)	(0.046)	(0.045)	(0.045)
Child(ren)	0.0263	0.0242	0.0218	0.0207
	(0.051)	(0.051)	(0.051)	(0.051)
No Money Support to Child	0.0119	0.0127	0.0119	0.0161
	(0.044)	(0.044)	(0.044)	(0.044)
No Allowance as Child	-0.0754*	-0.0783*	-0.0833*	-0.0843*
	(0.043)	(0.043)	(0.043)	(0.043)
No SaveTeach as Child	0.0377	0.0414	0.0355	0.0400
	(0.056)	(0.056)	(0.056)	(0.056)
Observations	535	535	535	535

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2.6 Appendix A

2.6.1 Descriptive Statistics from Regressions Sample

Table 2.14: Descriptive Statistics

	Mean	SD	Median	Min	Max	N
Probability Inheritance	0.22	0.32	0.03	0	1	1250
Probability Inheritance 10k	0.14	0.26	0.00	0	1	1250
Probability Inheritance 25k	0.10	0.23	0.00	0	1	1250
Probability Inheritance 50k	0.07	0.19	0.00	0	1	1250
Savings	0.80	0.40	1.00	0	1	1250
Female	0.44	0.50	0.00	0	1	1250
Age	56.49	16.07	60.00	16	91	1250
Income	26591.00	21570.76	23925.32	40	402384	1250
Income(log)	9.92	0.90	10.08	4	13	1250
Wealth	165501.23	204792.34	109420.00	0	2972540	963
Wealth(log)	10.26	3.58	11.60	0	15	963
Retired	0.34	0.47	0.00	0	1	1250
Primary Education	0.03	0.18	0.00	0	1	1250
Lower Vocational Education	0.23	0.42	0.00	0	1	1250
Intermediate General Education	0.10	0.30	0.00	0	1	1250
Intermediate Vocational Education	0.21	0.41	0.00	0	1	1250
Higher Vocational Education	0.27	0.44	0.00	0	1	1250
University Education	0.15	0.36	0.00	0	1	1250
Single	0.22	0.42	0.00	0	1	1250
Child(ren)	0.72	0.45	1.00	0	1	1250
Leave Inheritance	0.59	0.35	0.70	0	1	1250
Probability Working 62 years old	0.56	0.40	0.70	0	1	535
No Money Support to Child	0.53	0.50	1.00	0	1	1250
No Allowance as Child	0.32	0.47	0.00	0	1	1250
No SaveTeach as Child	0.15	0.36	0.00	0	1	1250

Table 2.15: Description of the Variables

	Main Variables Description
Age	Age of the individual
Child(ren)	Do you have any children?
Educational Levels Dummies	
Higher Vocational	High vocational level education
Intermediate General	Intermediate general level education
Intermediate Vocational	Intermediate vocational level education
Lower Vocational	Lower vocational level education
Primary	Primary school level education
University	University level education
Female	Gender of the individual is a woman
Income	Income earned in 2016
Income(log)	Income earned in 2016, expressed in logarithmic form
Leave Inheritance	What is the chance that you will leave an inheritance
No Allowance as Child	When you were between 8 and 12 years of age, did you receive an allowance from your parents then?
No Money Support to Child	Do you give large amounts of money to your children in order to transfer part of your capital to them, or are you planning to do so in the future?
No SaveTeach as Child	Did your (grand)parents stimulate you to save money between the age of 12 and 16?
Probability Inheritance	How likely is it that you will receive an inheritance in the next 10 years?
Probability Inheritance 10k	And how likely is that you will receive an inheritance of more than €10,000 in the next 10 years?
Probability Inheritance 25k	And how likely is that you will receive an inheritance of more than €25,000 in the next 10 years?
Probability Inheritance 50k	And how likely is that you will receive an inheritance of more than €50,000 in the next 10 years?
Probability Working 62 yrs	What are the chances, you think, of you having a full time paid job at the age of 62 or older?
Retired	Dummy variable indicating whether or not the individual is retired
Savings	Dummy variable indicating whether the individual saves money or not
Single	One component household without children
Wealth	Net worth
Wealth(log)	Net worth, expressed in logarithmic form

2.7 Appendix B

Exemptions and rates of gift and inheritance tax are corrected each year with an inflation correction. An exemption means that the recipient pays donation tax only if the value of it is higher than a certain amount. The following tables report the gift/inheritance exemptions.

Table 2.16: Donation Tax Exemptions 2016

Relationship with the donor	Exemption gift tax	Use of the donation
(foster) child	5,304 annually	general purpose
(foster) child 18-39 years*	25,449 one-off	general purpose
	53,016 one-off	house
		(renovation or repayment mortgage)
remaining	2,122 annually	general purpose

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands)

* For the increased exemptions, people can only use it once in their life. If recipient is 40 years old or older, but her partner is younger than 40: then, exemption applies.

Table 2.17: Inheritance Tax Exemptions 2016

Relation to deceased	Exemption
partner	636,180
(spouse / registered partner / notarial cohabitant)	
children	20,148
grandchildren	20,148
certain sick and disabled children	60,439
parents	47,715
all others	2,122

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

In the case in which the value of the donation is lower than or equal to the exemption then, the recipient does not pay a gift/inheritance tax; on the other side, if the value of

donation is higher than the exemption, then, the recipient has to pay the tax on the amount that exceeds the exemption. The amount of gift/inheritance tax to be paid depends on the relationship with the donor/deceased and the value of the donation.

Table 2.18: Rates for gift and inheritance tax 2016

Tariff group	Value of acquisition	Rates percentage
partner and (foster) children	0 - 121,902	10%
	more than 121,903	20%
grandchildren and further descendants	0 - 121,902	18%
	more than 121,903	36%
remaining	0 - 121,902	30%
	more than 121,903	40%

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

2.8 Appendix C

2.8.1 Subjective Distributions of Inheritance Expectations

As explained in Section 2.2 discussing the consistency of probabilities, we present the approach to derive subjective probability distributions from the observed inheritance expectations data. These probabilities are interpreted as points on the subjective cumulative probability distribution function of the inheritance expectations of individuals from our sample.

Parametric Approach

The parametric approach, proposed by Dominitz & Manski (1997), assumes that the reported probabilities follow from some parametric underlying distribution. Given the distribution and the reported inheritance expectations IE_k, the parameters θ_i of the distribution can be estimated by fitting the probabilities implied by the distribution, $F(IE_k; \theta_i)$, to those reported in the data. Assuming that subjective distributions are lognormal, we can write $F(IE_k; \theta_i)$ as:

$$F(IE_k; \theta_i) = 1 - \Phi \left(\frac{ln[IE_k] - \mu_i}{\sigma_i} \right)$$

where $\Phi(\cdot)$ is the standard normal cdf and μ_i and σ_i are individual specific parameters to be estimated.

The objective function defining the best possible fit chosen by Dominitz & Manski (1997) is the sum of the squared differences between implied and reported probabilities. Along this line, for each i, we choose the pair (μ_i, σ_i) that solves the least squares problem:

$$\min_{\mu_i, \sigma_i} \sum_{k=1}^{4} [F_{ik} - F(IE_k; \mu_i, \sigma_i)]^2$$

Once the parameters of the lognormal distribution are estimated, we can compute the descriptive statistics of the subjective inheritance expectations.

In Table 2.19, it follows the comparison between the observed (original) inheritance expectations and the ones reconstructed through the parametric approach previously presented.

Table 2.19: Descriptive Statistics

	Mean	Standard Deviation	Median	Min	Max	N
Probability Inheritance	0.22	0.32	0.03	0	1	1238
Probability Inheritance 10k	0.14	0.26	0.00	0	1	1238
Probability Inheritance 25k	0.10	0.23	0.00	0	1	1238
Probability Inheritance 50k	0.07	0.19	0.00	0	1	1238
Subjective Inheritance	0.20	0.31	0.00	0	1	1238
Subjective Inheritance 10k	0.13	0.25	0.00	0	1	1238
Subjective Inheritance 25k	0.09	0.22	0.00	0	1	1238
Subjective Inheritance 50k	0.06	0.19	0.00	0	1	1238

3 "Take the Money and Run": Dutch Evidence on Inheritance and Transfer Receiving and Divorce

3.1 Introduction

For years, the role played by inherited wealth as a fundamental driver in matrimonial strategies has always represented a very interesting topic. As pointed out in Pasteau et al. (2017)), this importance in 19th century Europe was highlighted by Thomas Piketty in his work *Capital in the Twenty-First Century* (2014), providing insights into the rigid structure of the societies of "patrimonial capitalism" that France and Great-Britain constituted at the time. In his work, Piketty (2014) argued that the last decades have seen a return of the importance of inherited wealth in those two countries, together with an increase in wealth inequality, which may lead to a renewed importance of inherited wealth in mating choices.

Inheritance can be conceived as an "unearned income" that, according to the life cycle model, should affect earnings, consumption, savings, and other economic outcomes (Imbens et al. (2001)): Brown et al. (2010) used a receipt of inheritance as a wealth shock and found that it was associated with a significant increase in the probability of retirement, especially when the inheritance was unexpected. The role of wealth in modelling labour decisions has been broadly considered for its effect on early retirement (Krueger & Pischke (1991), Brown et al. (2010), Bloemen & Stancanelli (2001)), on labour market participation Bloemen & Stancanelli (2001)), and on hours worked Imbens et al. (2001), Henley (2004)). Along these lines, inheritance might, for example, affect labour supply (Joulfaian & Wilhelm (1994)); indeed, Bloemen & Stancanelli (2001) found that wealth has a significantly positive impact on reservation wages and a negative impact on employment probability (higher levels of wealth result in higher reservation wages and higher reservation wages are associated with a lower employment probability).

Recent evidence has focused on the effect of receiving an inheritance on the Labour Force Participation (LFP) in married couples; bequests might, indeed, increase the bargaining power of the recipient, affecting his/her LFP, and providing new evidence on the ability

of spouses to commit to a fully efficient allocation of resources within the household (Blau & Goodstein (2016)). Bequests represent a component of wealth. Joulfaian (2006) found that wealth increases by only a fraction of the inheritances received, and implies a marginal propensity to consume significantly higher than the amount predicted within the perfect foresight or consumption smoothing frameworks. Wealth changes and their impact on consumption choices have been studied in many aspects with reference to real estate wealth change (Calcagno et al. (2009)), including inheritance receipt and its impact on labour supply (Brown et al. (2010)). Recent findings extended their points of view and investigated potential effects of inheritance receiving on other personal features of individuals, such as, for example, intention to bequeath (Stark & Nicinska, 2015).

What we want to do in this study consists in providing evidence on another, more personal, aspect on an individual's life, i.e., *divorce*. According to the literature, divorce motives are a consequence of different factors affecting the risk of divorce such as religion, family-related features, presence of children, etc. Indeed, along this line, religion has a clear negative effect on divorce. Consequences of divorce have been widely analyzed from numerous perspectives (Amato & Afifi (2006)). The effect of a parental divorce can be significant and substantial; people who have divorced parents (when they were growing up) might have higher chances of divorce than others. On the contrary, having children is associated with lower odds of divorce (De Graaf & Kalmijn, 2006a). In times when divorce was uncommon, the higher educated were more likely to divorce than the lower educated; presently, the lower educated are more likely to divorce than the higher educated (De Graaf & Kalmijn, 2006a). Recent studies have focused on the introduction of unilateral divorce legislation (Stevenson & Wolfers (2006); Wolfers (2006)); along this line, allowing people to file a divorce unilaterally increases individual well-being (Stevenson & Wolfers (2006)) and might reduce domestic violence (Brassiolo (2016)).

Needless to say, features different from a wealth endowment might affect chances of divorcing; divorce motives might also rely on other, more personal, features such as, for example, patience.

Anton Čechov, Russian physician, dramaturge, and author, highlighted in one of his stories the importance of patience in marital stability:

The chief thing in married life is patience...not love but patience[9].

In this regard, the literature has highlighted the important link between time preferences and marital stability; impatient individuals will seek to exit a marriage as soon as a shock occurs. An example of the relationship between marriage and marriage stability is the work of (Compton (2009)); the author, using the National Longitudinal Survey of Youth (NLSY) data, found that more patient individuals tended to remain in the marriage after a marital shock, while more impatient individuals tended to look for a "way out". Similar results come from the conviction that marriage can be considered as the result of spouses' willingness to invest in the long term viability of the marriage and to accept short-term disadvantages, giving rise to a lower propensity of divorcing (Compton (2009) and De Paola & Gioia (2017)). Furthermore, women's labour force participation can be a cause of divorce (De Graaf & Kalmijn, 2006b); the literature has broadly considered this feature, according to which marriages with a working wife run a higher risk of divorce than marriages in which the wife is unemployed (Poortman & Kalmijn (2002); Cherlin (1979); Spitze & South (1985); South & Spitze (1986); Greenstein (1990); Tzeng & Mare (1995); Babka von Gostomski et al. (1998); South (2001)). An increase in the expected earnings of women, on the other hand, has the opposite effect, and actually appears to raise the probability of dissolution and reduce the propensity to remarry (Becker et al., 1977). In studies of female labour supply, for example, there is growing awareness that both marital status and fertility decisions are strongly interrelated with female labour supply decisions and can therefore no longer be considered exogenous from a lifecycle perspective (van der Klaauw, 1996). In addition to that, the probability of future divorce strongly depends on female labour market participation. Interruptions in labour market participation caused by marriages, as well as the birth and presence of children, can have long-term effects through lower future wages associated with less labour market experience, making the female more economically dependent on the

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[9] Anton Čechov, The duel, 1891.

husband (van der Klaauw (1996) and Pestel (2017)).

This paper aims at studying whether receiving an inheritance or a transfer can, in some way, enhance the chances of getting divorced, and we contribute to the literature providing new evidence analysing this relationship. In order to do so, our empirical methodology involves the use of the DNB Household Survey (DHS), a Dutch panel dataset collected by the CentERdata that allows study of both psychological and economic aspects of financial behaviour. This panel survey was launched in 1993 and comprises information on work, pensions, housing, mortgages, income, possessions, loans, health, economic and psychological concepts, and personal characteristics. We concentrate our analysis observing Dutch coupled households in the years between 2002 and 2016.

Starting from the idea that an inheritance receipt might have an impact on various aspects of an individual's life, we perform a Cox proportional hazard ratios model estimating the probability that a married couple divorces and how this probability varies through time, identified by the duration of the marriage, trying to understand the role of inheritance/gift receipt, differentiated between inheritances/gifts received by the husband or the wife, and other covariates that might affect the transition probability.

Findings suggest that, in the case in which the inheritance/gift has been received by the husband, there is a negative and significant impact on getting divorced while, when it has been received by the wife, this enhances the chances that separation of the couple will occur. This signals that receiving an inheritance/gift changes the bargaining power in the couple: while for the husband, who probably already was in a predominant position in the household, a wealth endowment, such as an inheritance or a transfer is, does not represent an incentive to divorce, for the wife, results seem suggesting that that she might perceive a change in the bargaining enhancing the chances of marital disruption. Presence of child(ren) in the household seems to deter divorce; indeed, it appears to act as "glue" for the marriage reducing the chances of separation. Related to the latter variable, possible concerns might arise about whether any causal conclusion can be drawn from this work: inheritance receipt is a wealth endowment which, in our analysis, as it will be better explained in the description

of the main variables, always came before divorce (the inheritance/transfer variable has been constructed as a lag variable to avoid any simultaneity between inheritance receipt and divorce); moreover, we also conduct the analysis excluding endogenous regressors such as the variable reporting the number of children in the household and results still hold. Before proceeding with the description of the data, it could be interesting to briefly illustrate how divorce rules work in the Netherlands[10] and consider some changes in divorcing procedures that have occurred in the last two decades in the Netherlands.

Divorce in the Netherlands. As reported from the Centraal Bureau voor de Statistiek (CBS), between 1 April 2001 and 1 March 2009, it was possible for married couples in the Netherlands to convert their marriage into a registered partnership; this partnership could then be annulled without having to go to court. For some couples, this so-called "flash divorce" (*flitsscheiding*) was a serious alternative to divorce[11]; the increase in the number of flash divorces almost completely compensated for the decrease in the number of divorces in recent years. As shown in Figure 3.1, the highest numbers of flash divorces were recorded in the years from 2003 to 2005, when around 5,000 couples annually separated using this procedure. The number of flash divorces was lowest in 2001, when the procedure was introduced, and in 2009, when it was rescinded.

Arranging a divorce, a legal separation, or the termination of a registered partnership needs some arrangements to be made. First of all, the couple wishing to legally separate, divorce, or terminate the registered partnership has to draw up a settlement[12] in which they set out the agreements concerning (possible) children, maintenance, pension, and other matters; then, they submit a petition for divorce to the court through a lawyer.

There are three ways for married partners to separate: divorce; legal separation (partners are still married but they do not live together); and dissolution of the marriage after legal

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[10] The information provided comes from the *Rijksoverheid*, i.e., the Dutch Government and the *Belastingdienst*, the Dutch Tax and Customs Administration.

[11] In March 2009, the government banned the flash divorce option and processing of divorces reverted to earlier conditions.
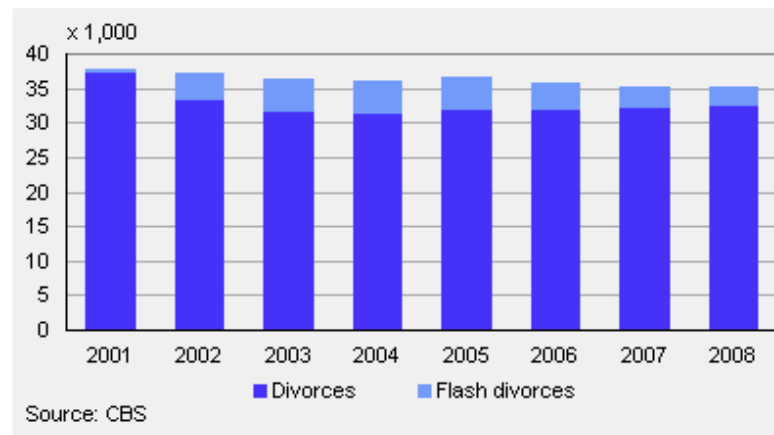
[12] Settlements are usually, but not necessarily, drawn up by a lawyer; moreover, there is no obligation to draw up the settlement.

Figure 3.1: Divorces and Flash Divorces - Statistics Netherlands

Flash divorces

Source: CBS
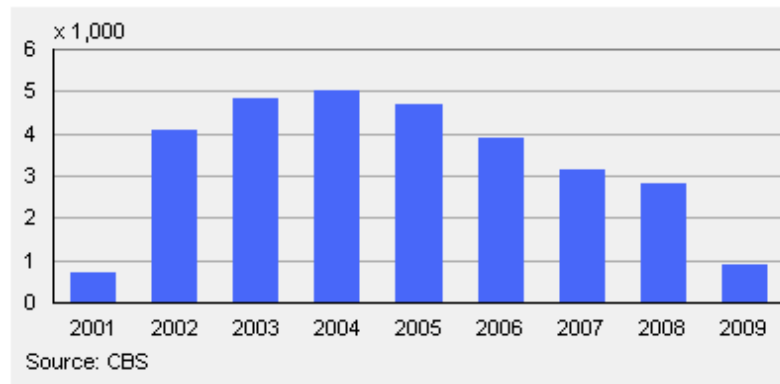
Divorces and flash divorces

Source: CBS

separation[13]. After the court issues a divorce decree, individuals must finalise the divorce by recording it in the registry of births, deaths, marriages, and registered partnerships in the municipality where they married. One important issue to be considered when talking about divorce is the cost of divorce proceedings. The costs due to them comprise:

- Court fees: court fees must be paid to file a petition for divorce;

- Legal fees: costs related to the (possible) engagement of a lawyer to file the divorce petition with the court; and

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[13] In the case in which the couple has a registered partnership, are in agreement, and do not have children, they could also terminate the relationship out of court.

- Mediation fees: the couple could also wish to engage a mediator[14].

So far, nothing seems different in the rules related to divorce in the Netherlands; however, compared with other countries, the Netherlands has different rules concerning the financial consequences of marriage. In many countries, marriage does not affect the assets of the spouses; possessions are deemed mutual property starting from the day the couple married, less premarital assets, gifts, and inheritances. The same cannot be said for the Netherlands. Couples who do not arrange a marriage settlement are automatically wed under the "community of property"; this means that through marriage, all assets become community property, including all their premarital assets, gifts, and inheritances. At this point, since we are dealing with inheritance and gifts, it could be interesting to mention how inheritances and transfers taxation works in the Netherlands since *inter-vivos* transfers might sometimes represent close substitutes for inheritances, and may come with tax advantages.

Information on inheritances and gifts taxation in the Netherlands In the Netherlands, gifts and inheritances are subject to different principles, depending on the "intergenerational relationship" between the provider of the gift/inheritance and the recipient. One of the most glaring aspects that comes to mind when talking about a donation or an inheritance is related to paying taxes; however, according to the *Belastingdienst*, the Dutch Tax and Customs Administration, there are some exemptions depending on the amount of the gift/inheritance and also depending on the relationship with the donor. For example, in 2016, the maximum amount of a donation from a parent to her son, daughter, or foster child exempts up to about 53,000 euros once in the life of a child. It is also possible to make a donation to a child of about 5,300 euros exempt from tax in a year. In Appendix 3.6, we present some examples concerning exemptions and tax rates on donations/inheritances.

The rest of the paper is arranged as follows: Section 3.2 and Section 3.3 describe the data and the empirical methodology, and Section 3.4 concludes the paper.

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[14] Though not required, a mediator can help individuals make arrangements that work for both of them. In some cases, legal aid is available to cover some of the costs involved; if they have legal expenses insurance, the insurer may reimburse them for some or all of the costs.

3.2 Data Description

Our empirical analysis relies on the DNB Household Survey (DHS), a Dutch panel study collected by the CentERdata, a survey agency at Tilburg University specialising in Internet surveys. This panel survey was launched in 1993 and comprises information on work and pensions, accommodation and mortgages, income and health, assets and liabilities, and economic and psychological concepts. The questionnaires were sent to the respondents via the Internet, the respondents filled in the questionnaires at their home computers, and then answers were sent back in the same way. This implies that the questionnaires were self-administered and individuals could answer at the most comfortable time for them. It is important to note that the selection of panel members of the survey was not dependent on Internet access; indeed, households without a computer or an Internet connection were provided with the necessary equipment. We focus on coupled households during the years 2002 through 2016[15]. As presented in the introduction, we want to study whether having received a money endowment, being it an inheritance or gift[16], might lead toward marital disruption. With this in mind, we present the time-series of the different marital statuses of individuals in our sample; as shown in Figure 3.2, the frequency of divorces is quite low compared with marriages. For the aim of this work, we constructed the dependent variable *divorce* as a dummy variable that takes the value of 1 if the couple divorced and the value of 0 otherwise.

The other feature we were concerned about is related to inheritance/gift receiving; along this line, also in order to avoid cases in which divorce occurred before the inheritance receipt, the respondents having received an inheritance had a lag variable, meaning that it took value 1 in cases in which the individual received the endowment the year before and 0 otherwise. The share of people who received an inheritance represented around the 6%-8% of our sample

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[15] The choice of these years lies in the fact that, in the years before 2002, when this survey was the *VSB-CentER savings project*, there have been some changes both in the direction management of the survey and in the sampling procedure, and some individuals drop also out from the survey; with this in mind, we start the analysis from 2002 being sure that we are able to follow the couples over time.

[16] The exact wording of the question asking for inheritance receipt was *"Did you receive any inheritances and/or gifts in (year)?"*. Data did not allow us to distinguish whether the wealth endowment was an inheritance or a gift.

Figure 3.2: Marital Status Composition
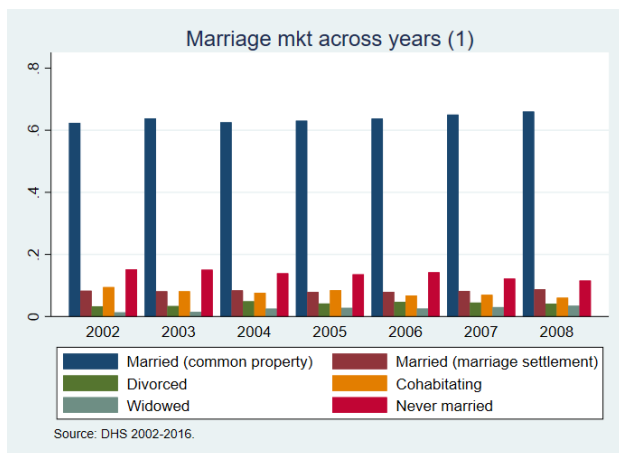
(a) Marital Status Composition
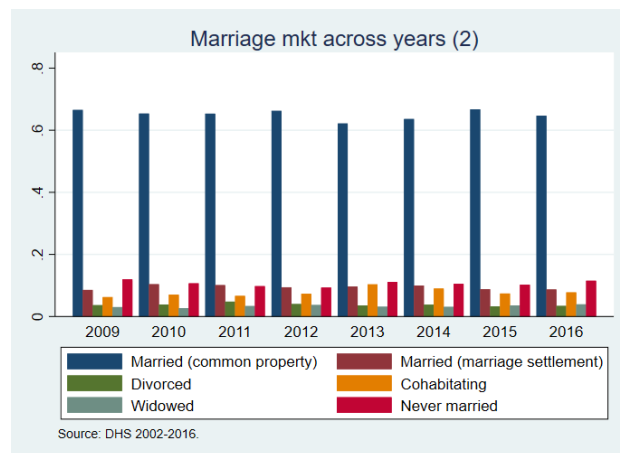
(b) Marital Status Composition

population. Since we were dealing with couples, we made a distinction between cases in which the inheritance/gift had been received by the husband and whether it had been received by the wife (see Figure 3.3); in this way, when conducting the empirical analysis, we should be able to capture any bargaining power, if present, in the couple.

Figure 3.3: Inheritance Receipt
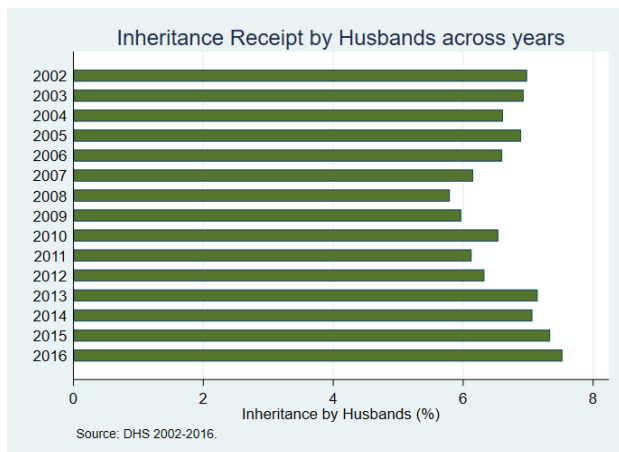
(a) Husband as Recipient
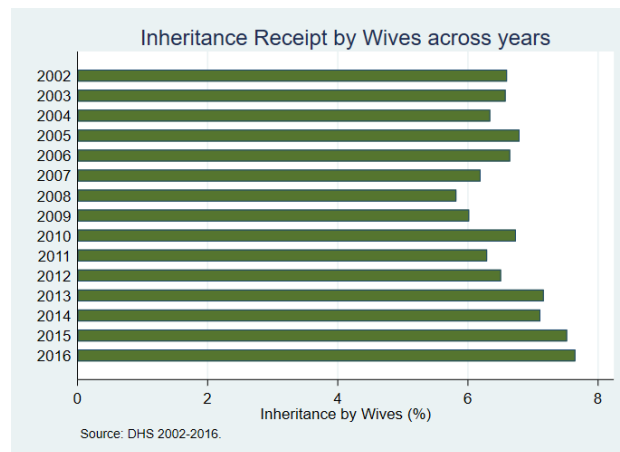
(b) Wife as Recipient

One possible concern could be related to the fact the inheritance/gift receipt, even if individually received, is perceived at the couple level so that the partner who does not receive it answers positively to the question if the beneficiary is his/her partner: however,

there are very few cases (around 50 couples) in which both spouses affirm that they have got an inheritance/gift[17].

Needless to say, features different from a wealth endowment might affect the chances of divorcing; this represents the reason why we controlled for some variables related to the household (all variables are described in Table 3.4) such as, for example, the mean age in the household and the difference in ages between spouses, a few dummies for educational level of the head of the household and the differential in educational attainments between partners, income of both couple components, and child(ren) present in the household. For the latter variable, we report the number of child(ren) present in the household since we expected that the presence of children in the household should have had a different impact on the chances of getting divorced compared with the mere presence of children in the household.

Descriptive statistics are reported in Table 3.5; we differentiate between wife, husband, and household characteristics. On average, it appears that there is great differences between personal income of spouses; indeed, the mean income of wives (around €6,000) is much lower compared with male income (around €16,000). This fact is also reflected in the lower percentage of working wives (around 44%) versus a value of around 60% for working husbands; concerning educational attainments, there are no great differences between women and men even though, if we focus our attention on university education level it appears that the percentage of husbands with a university level of education is higher compared to wives (around 13& versus 7%, respectively). Eventually, it might be worth noticing that the mean duration of marriage, variable that represents our time period for the empirical analysis we present in next section, is around 23 years, quite high considering that overall, the average age ranges between 53-55 years.

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[17] We also conduct the analysis dropping cases in which both partners state to have received an endowment the year before and results hold.

3.3 Empirical Analysis

In this section, we present the empirical methodology used, aiming at a better understanding of the relationship between inheritance/gift receiving and the chances of getting divorced.

We perform a survival analysis through the Cox proportional hazard ratios model. The Cox (1972) model is expressed by the hazard function denoted by $h(t)$; the hazard function can be interpreted as the risk of divorcing at time t. It can be estimated as follows:

$$h(t) = h_0(t)exp(b_1 x_1 + b_2 x_2 + ... + b_p x_p)$$

where, t represents the survival time, $h(t)$ is the hazard function determined by a set of p covariates $(x_1, x_2, ..., x_p)$, and the coefficients $(b_1, b_2, ..., b_p)$ measure the impact. The term h_0 is called the baseline hazard. In particular, we estimate the probability that a married couple divorces and how this probability varies through time, identified by the duration of the marriage (in years) trying to understand the role of inheritance/gift receipt, differentiated between inheritances/gifts received by the husband or the wife, and other covariates that might affect the transition probability.

Hence, data were set as generally done in survival analysis or unemployment duration models, in which our time analysis was the duration of the marriage and the potential failure was identified by the end of the marriage, i.e., the divorce. In this way, we were able to follow the couples until the separation occurred[18]. Therefore, we estimate the hazard function $h(t)$ that determines the probability that the couple moves from marriage to divorce at time t, i.e., the risk of divorcing at time t, identified as the duration of the marriage. The set of covariates we control for (presented and discussed in the previous section) are , for example, whether the recipient of the inheritance was the husband or the wife, a few dummies for the educational level of the head of the household, personal income of both partners (in logarithmic form), etc. We also included the delta in educational level between spouses with the aim of capturing bargaining power, if any.

Results are presented in Table 3.1. It appears that, in the case in which the inheri-

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[18] Those who already divorced at the beginning of the time period analysis are not present in our dataset.

tance/gift has been received by the husband, there is a negative and significant impact on getting divorced while, when it has been received by the wife, this enhances the chances that separation of the couple will occur.

This suggests that receiving an inheritance/gift changes the bargaining power in the couple: while for the husband, who probably already was in a predominant position in the household, a wealth endowment, such as an inheritance or a transfer is, does not represent an incentive to divorce, for the wife, results seem suggesting that that she might perceive a change in the bargaining enhancing the chances of marital disruption. The presence of child(ren) in the household[19] seems to deter divorce. This result is in line with the literature supporting the fact that children increase marital stability above all when they are very young (Waite & Lillard (1991), Huber & Spitze (1980) and (De Graaf & Kalmijn, 2006a)).

At this point, an important piece of information that might be worth observing concerns the amount of the inheritance received by individuals[20]; therefore, since individuals were asked to report the amount of the inheritance/gift received, we exploited this information and we ran a regression in which we used a control, instead of the dummies indicating who benefited from the wealth endowment, the amount (in logarithm) of the inheritance/gift received. Results, presented in Table 3.2, confirm previous findings. It seems that a gender effect is present, suggesting that, when the inheritance/transfer is received by the wives, divorce is more likely to occur. This fact could be partially related to some traits we do not observe. Kalmijn et al. (2004) argued that the validity of economic explanations of divorce, i.e., high likelihood of divorce if women work for pay and have attractive labour market resources, is conditional on cultural values. Indeed, cultural hypotheses have argued that divorce chances increase if women adhere to emancipatory norms, independent from their labour market positions. Therefore, also in this case, it appears that the bargaining power has changed after receiving an inheritance/gift.

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[19] We also conduct the analysis excluding endogenous regressors such as the variable reporting the number of children in the household and results still hold.

[20] Unfortunately, we do not have information about the type of inheritance/gift so we cannot distinguish whether the inheritance consisted in money or real estate, etc., and we do not know who bequeathed or made the transfer.

Along this line, the negative and statistically significant coefficient of the delta in educational level in the household supports the importance of bargaining power in the couple. Indeed, as long as the delta in educational attainments increases, keeping constant the education of the head of household for which we control for, meaning that the educational attainment of the wife is lower, the decrease in the chances of getting divorced signals the low bargaining power on the side of the wife. Again, and in line with the previous results, the presence of children seems to act as "glue" for the marriage and diminishes the chances of separation.

Starting from the fact that, from previous results, it appears that bargaining power in the couple is present, we analyze whether results change when considering the income distribution of the wife, the figure less "powerful" in the couple. Therefore, we split the analysis between two cases: if the income of the wife belongs to the bottom quintiles of the distribution and if the income relies in the top classes of wives' income distribution. Results are reported in Table 3.3; it appears that the inheritance receipt enhances the chances of getting divorced when the wife's income is low. These findings can be explained by the fact that, potentially, women belonging to the bottom of income distribution also represent the ones whose bargaining power in the couple is quite unreal so, they embody the ones for whom an inheritance receipt might represent an empowerment leading toward marital disruption; on the other side, we do not observe any enhancement in chances of getting divorced for the case in which in the couple the wife belongs to top levels of income distribution; as for the results of previous specifications related to the inheritance receipt by the husband, for wives with high incomes, whose bargaining power could potentially be almost to an equal extent in the couple, a wealth endowment, such as an inheritance or a transfer is, does not represent an incentive to divorce. Also in this case, considering the first column of Table 3.3, the negative and statistically significant coefficient of the delta in educational level in the household supports the importance of bargaining power in the couple; indeed, as long as the delta in educational attainments increases the decrease in the chances of getting divorced signals the low bargaining power on the side of the wife.

Table 3.1: Effect of Inheritance on Divorce

	Cox Model
Inheritance Receipt Husband*	-36.4612***
	(0.5050)
Inheritance Receipt Wife*	2.4491***
	(0.7317)
Mean Age in hh	-0.0512***
	(0.0139)
Delta Age in hh	-0.0871**
	(0.0364)
Child(ren) in hh	-1.1370**
	(0.4628)
Primary Education of hh	0.3919
	(0.8483)
Low Vocational Education of hh	0.8994
	(0.7080)
Intermediate General Education	1.9834**
	(0.8676)
Delta in Educational Level in hh	-0.2932
	(0.2235)
Working Husband	-0.3268
	(0.8089)
Working Wife	-0.1933
	(0.7888)
Income(log) Husband	0.0057
	(0.0584)
Income(log) Wife	-0.1487
	(0.0919)
Observations	13784

Cox Proportional-Hazards Model.

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2002-2016. * Dummy variables

Table 3.2: Effect of Amount of Inheritance on Divorce

	Cox Model
Inheritance Receipt Husband (log)	-8.3404***
	(0.3517)
Inheritance Receipt Wife (log)	0.2055*
	(0.1219)
Mean Age in hh	-0.0519***
	(0.0152)
Delta Age in hh	-0.0965***
	(0.0349)
Child(ren) in hh	-1.1327**
	(0.5083)
Primary Education of hh	-1.3359***
	(0.4243)
Low Vocational Education of hh	-0.0717
	(0.5996)
Delta in Educational Level in hh	-0.4765***
	(0.1379)
Working Husband	-0.4446
	(0.8519)
Working Wife	-0.3875
	(0.9135)
Income(log) Husband	-0.0068
	(0.0602)
Income(log) Wife	-0.1451
	(0.0943)
Observations	13702

Cox Proportional-Hazards Model.

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2002-2016. * Dummy variables

Table 3.3: Effect of Amount of Inheritance on Divorce - Difference by Income Distribution

	Bottom Quintiles of Wife Income	Top Quintiles of Wife Income
Inheritance Receipt Husband*	-36.4270***	-38.7553***
	(0.5775)	(0.9487)
Inheritance Receipt Wife*	2.8481***	-38.9234***
	(0.6416)	(1.9053)
Mean Age in hh	-0.0551***	0.0468
	(0.0158)	(0.0834)
Delta Age in hh	-0.0722**	-0.1962***
	(0.0292)	(0.0694)
Child(ren) in hh	-1.0425**	-0.1886
	(0.5287)	(0.6302)
Primary Education of hh	-1.0868**	
	(0.5101)	
Low Vocational Education of hh	0.3275	-42.4695***
	(0.4490)	(1.1863)
Intermediate General Education		3.7105
		(2.3113)
Delta in Educational Level in hh	-0.4920***	0.1109
	(0.1786)	(0.3469)
Working Husband	-1.3801**	40.8260***
	(0.6805)	(7.3718)
Working Wife	0.2995	-40.3141***
	(0.9813)	(1.1277)
Income(log) Husband	0.0036	-0.1303
	(0.0627)	(0.1413)
Observations	8602	5182

Cox Proportional-Hazards Model.

Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: DHS 2002-2016. * Dummy variables

3.4 Final Remarks

Divorce motives might be consequences of different factors affecting risks of divorce. Literature has provided evidence on some of them: religion has a clear negative effect on divorce; people with divorced parents might have higher chances of divorce than others; on the contrary, having children can be associated with lower odds of divorce (Waite & Lillard (1991), Huber & Spitze (1980) and (De Graaf & Kalmijn, 2006a)). Furthermore, women's labour force participation can be a cause of divorce (De Graaf & Kalmijn, 2006b). An increase in the expected earnings of women, on the other hand, has the opposite effects: it appears to raise the probability of dissolution and to reduce the propensity to remarry (Becker et al., 1977). In the study of the female labour supply, for example, there has been growing awareness that both marital status and fertility decisions are strongly interrelated with female labour supply decisions and can therefore no longer be considered exogenous from a lifecycle perspective (van der Klaauw, 1996). In addition to that, the probability of future divorce strongly depends on female labour market participation. Interruptions in labour market participation caused by marriages, as well as the birth and presence of children, can have long-term effects through lower future wages associated with less labour market experience, making the female more economically dependent on the husband (van der Klaauw (1996) and Pestel (2017)).

This paper aimed at studying whether a wealth endowment, in this case, having received an inheritance or a transfer, enhanced the chances of marital disruption. In order to do so, we used the DHS panel dataset from the Netherlands, concentrating our attention on the years between 2002 and 2016. To analyze this relationship, we performed a survival analysis through the Cox proportional hazard ratios model; in particular, we estimate the probability that a married couple divorces and how this probability varies through time, identified by the duration of the marriage, trying to understand the role of inheritance/gift receipt, differentiated between inheritances/gifts received by the husband or the wife, and other covariates that might affect the transition probability. The set of covariates we control for are, for example, whether the recipient of the inheritance was the husband or the wife, a

few dummies for the educational level of the head of the household, personal income of both partners (in logarithmic form), etc. We also included the delta in educational level between spouses with the aim of capturing bargaining power, if any. Findings suggest that, in the case in which the inheritance/gift has been received by the husband, there is a negative and significant impact on getting divorced while, when it has been received by the wife, this enhances the chances that separation of the couple will occur. This signals that receiving an inheritance/gift changes the bargaining power in the couple: while for the husband, who probably already was in a predominant position in the household, a wealth endowment, such as an inheritance or a transfer is, does not represent an incentive to divorce, for the wife, results seem suggesting that that she might perceive a change in the bargaining enhancing the chances of marital disruption. We also checked whether the size of the inheritance matters exploiting the amount of the inheritance/gift received. Results confirm previous findings suggesting that, when the inheritance/transfer is received by the wives, divorce is more likely to occur. Presence of child(ren) in the household seems to deter divorce; indeed, it appears to act as "glue" for the marriage reducing the chances of separation. One possible concern could be related to the fact it could be that individuals who expect an inheritance opt for separating from the partner in order to not incur the possibility of splitting the future amount received. However, the current data do not allow to check for inheritance expectations; maybe, a future study could try to analyze a relationship between inheritance expectations and probability of divorcing.

3.5 Appendix A

3.5.1 Variables Description and Descriptive Statistics

Table 3.4: Description of Variables

	Main Variables Description
Individual Variables	
Age	Age of the individual
Income	Income earned
Income(log)	Income earned, expressed in logarithmic form
Inheritance Receipt	Dummy variable indicating whether or not the individual received an inheritance
Educational Levels Dummies	
Primary	Primary school level education
Lower Vocational	Lower vocational level education
Intermediate General	Intermediate general level education
Intermediate Vocational	Intermediate vocational level education
Higher Vocational	High vocational level education
University	University level education
Working	Dummy variable indicating whether or not is working
Household Variables	
Child(ren) in hh	Number of children in the household
Divorced	Dummy variable indicating whether or not the couple divorced
Duration of Marriage	Variable indicating the number of years of marriage

Table 3.5: Descriptive Statistics

	Mean	Standard Deviation	Min	Max
Wife Characteristics				
Income	6036.83	12263.58	0	335153.7
Age	53.29	14.49	21	99
Inheritance Receipt	0.06	0.15	0	1
Educational Level Dummies				
Primary	0.07	0.26	0	1
Lower Vocational	0.33	0.47	0	1
Intermediate General	0.12	0.32	0	1
Intermediate Vocational	0.18	0.39	0	1
Higher Vocational	0.22	0.42	0	1
University	0.07	0.26	0	1
Working	0.44	0.50	0	1
Husband Characteristics				
Income	16394.15	22578.09	0	579584
Age	55.03	14.76	17	94
Inheritance Receipt	0.05	0.18	0	1
Educational Level Dummies				
Primary	0.04	0.20	0	1
Lower Vocational	0.26	0.44	0	1
Intermediate General	0.09	0.29	0	1
Intermediate Vocational	0.22	0.41	0	1
Higher Vocational	0.26	0.44	0	1
University	0.13	0.34	0	1
Working	0.60	0.49	0	1
Household Characteristics				
Duration of marriage	22.61	15.88	0	84
Divorced	0.09	0.30	0	1
Number of child(ren) in the hh	1.76	1.08	0	7
N		13784		

Source: DHS 2002-2016.

3.6 Appendix B

Exemptions and rates of gift and inheritance tax are corrected each year with an inflation correction. An exemption means that the recipient pays donation tax only if the value of it is higher than a certain amount. The following tables report the gift/inheritance exemptions.

Table 3.6: Donation Tax Exemptions 2016

Relationship with the donor	Exemption gift tax	Use of the donation
(foster) child	5,304 annually	general purpose
(foster) child 18-39 years*	25,449 one-off	general purpose
	53,016 one-off	house
		(renovation or repayment mortgage)
remaining	2,122 annually	general purpose

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands)

* For the increased exemptions, people can only use it once in their life. If recipient is 40 years old or older, but her partner is younger than 40: then, exemption applies.

Table 3.7: Inheritance Tax Exemptions 2016

Relation to deceased	Exemption
partner	636,180
(spouse / registered partner / notarial cohabitant)	
children	20,148
grandchildren	20,148
certain sick and disabled children	60,439
parents	47,715
all others	2,122

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

In the case in which the value of the donation is lower than or equal to the exemption then, the recipient does not pay a gift/inheritance tax; on the other side, if the value of

donation is higher than the exemption, then, the recipient has to pay the tax on the amount that exceeds the exemption. The amount of gift/inheritance tax to be paid depends on the relationship with the donor/deceased and the value of the donation.

Table 3.8: Rates for gift and inheritance tax 2016

Tariff group	Value of acquisition	Rates percentage
partner and (foster) children	0 - 121,902	10%
	more than 121,903	20%
grandchildren and further descendants	0 - 121,902	18%
	more than 121,903	36%
remaining	0 - 121,902	30%
	more than 121,903	40%

Reference year: 2016. All amounts are expressed in euros. Source: *Belastingdienst* (The Netherlands).

4 Credit Access and Approval

Joint with Paola De Vincentiis, Eleonora Isaia, and Maria Cristina Rossi

4.1 Introduction

Discrimination in obtaining credit exists if people of different races or gender, controlling for all other factors, have different access to credit by having different probability of obtaining a loan or getting it at a different rate (Asiedu et al., 2012). Several papers have focused on whether discrimination is at work and to what extent. Looking, in particular, at the gender dimension, the empirical literature shows that indeed women receive less favourable treatment in the credit market.

Credit approval, however, is conditional on having asked for credit. Asking for credit is an individual choice, a complex process that underlies several mechanisms at work leading to the decision on whether to consider credit to fund an investment. Focusing on credit for firms' investment, rather than credit for consumption, the firm structure (e.g., business size, age, and sector of activity) would undeniably play a key role in shaping funding channels for an investment.

Would women differ in the way they fund an investment for their firms?
Female- and male-led enterprises show significant differences in the financial structure of firms (see Cesaroni (2010), for a survey, and more recently Stefani & Vacca (2013)). Evidence shows that women-led firms rely less on external capital than a personal one, and they tend to start with relatively lower capital. This evidence is also shown in future investments (Carter & Shaw (2006); Coleman & Robb (2009)).

Why should the capital structure of firms differ between genders?
Women experience more troubles in getting funded. Some sources of finance, such as venture capital, fund very few women-led businesses (3% of total venture capitals are those funded and led by women, as written in the Babcock report[21]).

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[21]http://www.babson.edu/news-events/babson-news/Pages/140930-venture-capital-funding-women-entrepreneurs-study.aspx

This low percentage could also be explained by the fact that few female enterprises use venture capital to a very limited extent (Aspray & Cohoon, 2007). All evidence leads to an ex-ante expectation of lower exposure to external capital when the firm is led by a woman. To this extent, we want to test whether this is true with regard to credit access to plan an investment. We do so by using a unique firm-level dataset, the RIL, on a sample representative of Italian firms.

The main features of female firms, other than capital structure, are that they are on average younger and smaller than male businesses, and more concentrated in the commercial and service sectors. Controlling for the type of business led by women will purge the data from the relationship between external finance and female-led firms.

Being able to rely on a survey representative of the whole sample of Italian firms, excluding the agricultural sector, we claim we can have generalised results for the population of firms, and we also break down the results between type of firm and dimension. We use the variable of gender of the decision-maker in the firm (the questionnaire identifies the person who is responsible for the firm, whether the CEO, manager, or owner). Our approach is similar in spirit to that of Ghignoni et al. (2018) who, using the same dataset, identify whether more educated firm leaders are also associated with fewer temporary jobs in the firm they lead.

Throughout the paper, we assume that the gender of the firm's main decision-maker is exogenously determined, and we interpret the results as causal. In principle, one might argue that the gender of the decision-maker is a choice that can be determined by similar (unobserved) factors as credit applications or credit approval chances of the firm (or might even be affected by credit approval history). This is something we cannot analyze with the data at hand. If it is indeed the case, our findings should be interpreted as associations rather than causal effects.

Results show that women, when they are the responsible people of the firm, seem to ask less for a loan, showing less propensity to search for loan funding. Results on being successful in obtaining credit do not show evidence of gender bias.

Results point to a lower demand of women-led businesses rather than a lower probability of success in obtaining credit.

The rest of this paper is laid out as follows. In section 4.2, we revise the main contributions in this area of empirical research. In section 4.3, we describe the data and how the sample is built up, and we provide the main descriptive statistics. Section 4.4 illustrates our regression results and the specification model, and section 4.5 concludes the paper.

4.2 Conceptual Framework and Literature Review

Small businesses led by women do not access credit on equal footing with those led by men. There is relevant evidence pointing in this direction, even if the issue is still controversial. The problem seems to emerge and has been explored in the literature at three different levels (see Table 4.1).

First level: Companies managed by women tend to apply less frequently for loans.
A few papers find that women-led SMEs tend to request fewer loans and finance their activity to a greater extent with their own funds or trade credit. Coleman (2000) finds that women-owned small businesses tend to rely less on external financing as a source of capital, despite not being discriminated against when applying for loans. Ongena & Popov (2016) explore the issue using a sample of European immigrants to the US. They find that female-owned SMEs apply less frequently for loans and that the phenomenon is positively correlated to the intensity of gender bias in the mother country of the immigrant. The gender bias measure is built on the basis of the answers given by survey respondents to a particular question focused on the role of women within the family.
A voice out of chorus is a paper by Stefani & Vacca (2013). These authors claim that the different frequencies in loan applications between men-led and women-led SMEs disappears when controlling more attentively for firm-specific features.

Second level: When applying for credit, SMEs managed by women face rejection more frequently than male companies do.

The evidence is more controversial on this second issue. Asiedu et al. (2012) explore both racial and gender discrimination in the access to credit, finding a higher denial rate for all minorities compared to small businesses owned by white men. Bellucci et al. (2010) show that female entrepreneurs face tighter credit availability and are more likely to pledge collateral. Cesaroni et al. (2013) find that during the subprime financial crisis, women-run firms suffered from a more pronounced contraction of credit availability, after controlling for all the observable characteristics of the firms. However, they do not have data on loan applications to understand if the greater credit rationing was due to supply-driven discrimination, demand-driven factors, or a combination of both.

On the contrary, other papers report no substantial difference in the availability of credit for female businesses when controlling for the sector, the dimension, and other structural features of the firm. Blanchflower et al. (2003), in a paper focused on the difficulties faced by black minorities in accessing credit, find that other disadvantaged groups like women and other ethnic minorities do not encounter similar issues. Cavalluzzo & Cavalluzzo (1998) find that women's access to mortgage credit is comparable to that of white men, with even some benefits to women located in concentrated markets. Stefani & Vacca (2013) confirm that not only the application, but also the denial rate does not seem to differ between male- and female-run small companies when taking all relevant factors into consideration. Ongena & Popov (2016) also confirm that even if women apply less for loans, no significant difference in the approval rate emerges.

Third level: When granted credit, women-led SMEs are charged a higher interest rate.

Muravyev et al. (2009) find evidence that female-run firms are less likely to obtain credit and pay a higher interest rate when the loan application is approved. Alesina et al. (2013), using a database of Italian companies, find evidence that micro-companies managed by women pay more on overdraft facilities. The higher cost of credit still holds true when controlling for the level of risk and for specific features of local credit markets. Other papers (see Table

4.1), on the contrary, maintain that the economic terms applied to credit are not correlated to gender.

What may be the roots of the phenomena observed?

A first explanation could be that female-led companies face worst credit access conditions for the very fact they are led by women. Due to cultural reasons and gender bias, bankers would trust these companies less than those in which the reins are in the hands of men. A slightly different, although related, explanation could be that women lack self-confidence. This, in turn, would manifest through self-selection and opt-out from loan application processes. In other words, women would not ask for loans because they are convinced they would be denied if they did so, even when this is not really the case.

A third explanation looks at risk aversion, especially in financial-decision environments. Women could apply less for loans because they are less bold and aggressive in their management behaviour. A rich stream of literature investigates this perspective and finds that women tend to be more cautious and defensive in their risk-taking strategies (Powell & Ansic (1997), Byrnes et al. (1999), Barber & Odean (2001), Eckel & Grossman (2008), Croson & Gneezy (2009)). Interestingly, Bellucci et al. (2010) find that this gender difference emerges not only when loan applicants are women, but also when loan officers are women: they tend be more prudent and restrict credit availability to new, unestablished borrowers more than their male counterparts. On the same line is the strong evidence found in microcredit, where women are more trustworthy, more prudent, and less likely to make default because of unwise money management.

Finally, the explanation could lie in the prevalent features of female-run companies The need for bank financing and the riskiness of the companies perceived by lenders could be related not to the gender of the manager or the owner but to the financial features, size, and sector of the company. In particular, descriptive evidence shows that female-run companies tend to be smaller and are concentrated in commercial and service sectors. We are able to control for these factors in our analysis so that the effect of having a woman heading a firm is detected.

Our work focuses on the frequency of loan application by firms when the decision-maker is a woman. Among the issues discussed above, this aspect is the least explored. The novelty of our paper is the use of a dataset representative of the firm sample, rather than having a subsample of firms. This sample allows us to better control for size effects and check if the opt-out phenomenon is still discernible in large companies when the person in charge for strategic decision-making is a woman.

We also check whether the fact that a company belongs to an international group makes any difference. The effect may be controversial, and we do not have a clear expectation on the matter. On one side, the exposure to an international environment could lower any culturally inherited barrier and make the woman approach bank financing more easily. On the other side, knowing that gender bias is higher in Southern Mediterranean countries, such as Italy, could make female managers reluctant to approach the local banking system and prefer intragroup financing in order to benefit from better financing conditions.

We control as well for other features of the firms managed by women that may encourage or discourage the demand for loans by affecting the risk profile and the need for bank capital. The list of variables used as regressors, and their explanation, is listed in Table 4.4. Important aspects to consider in this regard are the age of the company, the sector, the profitability, and the investments undertaken, especially for innovation in products and processes.

We control for the features of the woman leading the company, looking in particular at education level and age. We expect the culture-determined reluctance towards loan application to be negatively correlated to education. As for the age, we expect younger women to approach bank financing more similarly to men. In particular, we verify the intensity of the opt-out phenomenon by age bracket, and we explore the existence of a non-linear relation by including a squared-age term in the regression.

Finally, we include regional dummies to capture any local difference in credit offer, macroeconomic environment, and intensity of gender bias.

Table 4.1: Female-run SMEs and access to bank financing Literature review

	Lower application rate?	Higher denial rate?	Higher interest rate?
Cavalluzzo & Cavalluzzo (1998)	No	No	No
Coleman (2000)	Yes	No	Yes
Blanchflower et al. (2003)	n.a.	No	No
Alesina et al. (2013)	n.a.	n.a.	Yes
Muravyev et al. (2009)	n.a.	Yes	Yes
Bellucci et al. (2010)	n.a.	Yes	No
Asiedu et al. (2012)	n.a.	Yes	Yes
Cesaroni et al. (2013)	n.a.	Yes	n.a.
Stefani & Vacca (2013)	No	No	n.a.
Ongena & Popov (2016)	Yes	No	No

4.3 Data and Descriptive Statistics

We run the empirical analysis drawing from the sample of the Employer and Employee Survey (RIL) conducted by INAPP (previously ISFOL) in 2015. The RIL is a nationally representative sample of over 24,000 partnership and limited companies operating in the non-agricultural private sector in Italy. The RIL contains a rich set of information about personnel organisation, industrial relations, and other workplace characteristics. It also includes the demographics of the firm's decision-maker, such as the level of education, as well as age brackets and gender. For our purpose, the RIL has the advantage of containing the characteristics of the responsible person of the firm, as well as some investment channel strategy, such as having requested credit to fund investments, the key variable of our analysis. With regard to the sample selection, we only consider 'active' firms, meaning that we exclude wound-up firms or bankrupt firms, with a final sample of 29,789 observations.

As mentioned in the introduction, this dataset allows us to concentrate our attention not only on small and medium firms but also on large ones, so it could be interesting to see the distribution of firm size and also the age of the firms, highlighting (potential) gender differences.

The firm size is measured in terms of employees to categorise enterprises; enterprises qualify as micro, small, medium, and large as follows:

- A firm falls into the micro category if it employs fewer than 10 persons.

- A firm falls into the small category if it employs fewer than 50 persons.

- A firm falls into the medium-sized category if it employs fewer than 250 persons

- A firm falls into the large-sized category if it employs more than 250 persons

From Tables 4.2 and 4.3, we can notice that women are decision-makers above all in micro, small, or medium firms and mainly in 'young' firms. In detail, among large firms, the majority of these firms are led by men; along this line, the majority of 'aged' firms are led by men (women's share in leading firms reaches not even 1% of firms aged more than 50 years of activity).

Table 4.2: Firm size differentiated by gender of decision-maker

Type of firm	Man Led Firm	Woman Led Firm	Total
Micro Firm	12,467	2,710	15,177
Small Firm	8,123	1,133	9,256
Medium Firm	3,850	359	4,209
Large Firm	1,059	61	1,120
Total	25,499	4,263	29,762

Table 4.5 reports the descriptive statistics. Starting from the key variables on gender bias and credit demand, 17 percent of the sample firms asked for credit in 2015, with quite a successful acceptance rate equal to 87 percent. As long as the manager's gender is concerned, women run a small minority of firms, only 13 percent of the businesses in the sample. Turning to the firm characteristics, such as size, sector of business, and geographical locations in Italy, it is noteworthy that the northern part of the country is predominant. It is worth reminding that firms fall into the SMEs category if they employ fewer than 250 persons and have an annual turnover not exceeding 50 million euro and/or an annual balance sheet total

Table 4.3: Age categories of firms differentiated by gender of decision-maker

Age of firm	Man Led Firm	Woman Led Firm	Total
Up to 25 years	13,538	2,556	16,094
Between 25-50 years	10,692	1,549	12,241
Between 50-75 years	1,036	136	1,172
Between 75-100 years	173	20	193
Between 100-125 years	47	2	49
More than 125 years	13	0	13
Total	25,499	4,263	29,762

not exceeding 43 million euro. In our sample, on average, the average number of employees is 70 units, but ranges from 0 to over 140,000, while firm revenue is around 37 million euros, but climbs to a maximum of 191 trillion euros. Therefore, our analysis embraces all types of enterprises, spanning from micro to large companies. Dimensions are obviously related to the firm age, which, on average is 26 years old, suggesting that our sample reflects credit needs and attitudes of more mature businesses. Focusing on the organisation structure, we look at whether a company belongs to a group or is independent. As expected, 85 percent of the sample is independent, while only 11 percent belongs to a national group and 3 percent to a foreign one.

Regarding the sector, constructions and commerce represents the larger sector - 13 percent of the firms - while all other sectors have almost equal weight.

Moving to the main entrepreneurs' characteristics, they can be synthesised as follows. The average age is quite mature: almost 30 percent of entrepreneurs in the sample are more than 60 years old, while only 6 percent is less than 40. Therefore, more than half of business managers are concentrated around middle age. Such age distribution is reflected in the education level. Seven out of 10 entrepreneurs have at least a high school diploma, even if only three achieved a university degree or higher qualification. On the contrary, less-educated managers - i.e., middle/elementary school level - represent 20 percent of the sample.

Graphs 4.1 and 4.2 report information on credit demand and credit approval for men and women. Graph 4.1 gives a picture of the relationship between credit attitude and gender. It shows that female entrepreneurs tend to ask for credit much less than their male peers. The younger the age of the firm, the weaker the demand for credit is and the larger the gap between women and men is. However, after many years of experience, growing up a long credit and business history (more than 70 years), this credit gender relationship reverses its trend. Such evidence might suggest that women need time to become more confident, overcome their fears, and believe to be creditworthy.

Graph 4.3 reports information on the age categories and gender of the main respondents of the firms. Despite the fact that only 13 percent of the entrepreneurs in the sample are women, it is interesting to notice that the percentage of male entrepreneurs increases as they get older, while the percentage of female entrepreneurs decreases. Therefore, our picture shows that our female subsample is proportionally younger than the male one.

4.4   Regression Results

4.4.1   Empirical Model and Robustness Checks

The empirical strategy focuses on the drivers that might affect credit demand and credit approval; to do so, we have two different dependent variables: 1) credit demand, expressed as a dummy variable that takes a value of 1 if there has been a loan application during the year 2015, and 0 otherwise, and 2) credit approval, a dummy variable that assumes a value of 1 if credit demand has been fully approved.

$$CreditDemand_f = \beta_0 + \beta_1 female_f + \beta_2 X_f + \epsilon_f$$

$$CreditApproval_f = \theta_0 + \theta_1 female_f + \theta_2 X_f + \mu_f$$

Where f stands for the firm identifier, and individual regressors such as female and education relate to the person responsible for the firm (manager, owner, or CEO)[22].

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[22] For each firm, it is asked who is the responsible person (i.e., who makes the strategic decisions). The

The explanatory variables include all variables characterising the firm, as well as variables characterising the decision-maker of the firm (as specified in the question described in the introduction). For example, we use the age of the firm, which should capture a different 'stability' and degree of being renowned by the local community, including the financial sector. The decision for credit is likely to be determined by how rooted the firm is in the local community. The size of the firm could play an important role, firstly as larger firms could be better equipped to ask for credit and considered more solid and less risky in the financial market. Firm size could also interact with the features of the decision-maker. In small firms, the role of the decision-maker is likely to be pivotal (as s/he is the only person to make decisions). On the other side, in medium and larger firms we expect a more diluted impact of the individual variables characterising the decision-maker.

For this reason, we also include interaction terms between the gender of the firm's decision-maker and the firm size[23].

The main issue we are concerned about in this work is the role played by the fact that the person in charge for strategic decision-making is a woman. We also include the following control variables that might be distinguished between structural features of the firm (e.g., number of employees, share of female employees, age of the company, profitability, belonging to a national or international group, sector dummies, dummies for the legal status of the firm) and characteristics mainly related to the main respondent of the firm (e.g., age and education level); in Table 4.4, dependent and independent variables are described. Finally, we include regional dummies to capture any local difference in credit offer, macroeconomic environment, and intensity of gender bias.

In Table 4.6, we report results from Probit regression. We find significant evidence only for credit demand (coefficient statistically significant at 1 percent level) but no significant effect for credit approval; in particular, it appears that women-led firms have two percentage

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possible answers are: 1) the owner/the family owner or CEO, 2) manager chosen within the firm, or 3) manager chosen outside the firm.

[23] We also run other specifications of our model without firms that have opted for layoffs (defined in Italy as 'Cassa Integrazione Guadagni'), reduction in terms of number of employess, etc. without affecting final results.

points lower probability of asking for credit than men-led ones. It is interesting to notice that it seems that younger decision-makers, those belonging to an age ranging between 15 and 39 years old, apply more compared to more experienced decision-makers; however, younger individuals might have less chance of getting the loan application approved (six percentage points lower probability).

One of the possible concerns in our analysis is the selection issue. Obtaining credit is subsequent to having asked for it, hence, the probability of succeeding in obtaining credit has been estimated for the subsample of those firms that applied for a loan. The selection of the sample is far from random, and this feature could affect final results. Put differently, only good debtors ask for credit. To allow for the possibility that selection issues affect the estimates, we also estimate our model using a Heckman model (the so-called Heckman Probit, taking into account the dichotomous nature of the main dependent variable). We use as an exclusion restriction variable a variable capturing the general availability of credit, which we proxy with the number of branches. The branch density, an index reporting the concentration of banks by regions[24], is strongly significant in the selection equation (and has no predictive power in the main equation). Results, reported in Table 4.7, are similar to the results not correcting for selectivity and show no evidence of selection at work. The correlation coefficient, ρ, is not significantly different from zero.

As previously pointed out, firm size could also interact with the characteristics of the decision-maker. The rationale is that the relationship between the main responsible person and the credit approach in a firm could be diluted, thus making the association between the credit decision and the responsible person less clear. Thus, in Table 4.8, we include as a control interaction terms between the gender of the firm decision-maker and the firm size: even if the 'female' effect does not point out any differences among firms' sizes, it is interesting to notice that the negative impact related to the gender of the decision-maker holds, and it appears that medium firms apply more for credit (almost seven percentage points higher probability than small firms) as well as large firms, which ask more for credit

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[24] To avoid problems of multicollinearity, we do not add regional dummies as controls, but we substitute them with macro-area dummies (North, Centre, South).

but less than medium ones. Along this line, aiming at capturing any differences related to how rooted the firm is in the local community, we exploit the age of the firm categorised in three main classes[25] interacting with the gender of the decision-maker. Results are reported in Table 4.9: it appears that 'young' women-led firms demand for credit less compared to the ones that are probably more well known by the local community.

4.5 Concluding Remarks

In this paper, we make use of a representative dataset for the year 2015 of Italian firms, the RIL, which excludes agricultural firms, to detect the determinants of credit demand and credit approval, using a gender lens. Our results, robust to different specifications, show that a gender-detrimental effect is found at a significant level only for credit demand. Instead, we find no significant evidence that credit approval is negatively affected by the gender of the firm manager. This result holds also when we allow for selection in having asked for credit, which could be responsible for a self-selection channel through which only good debtors ask for credit.

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[25] We differentiate between firms below 15 years, between 15 and 30 years, and firms whose age is above 30 years.

4.6 Appendix A

4.6.1 Description of Variables and Descriptive Statistics

Table 4.4: Description of Variables

Name of the Variable	Description of Variables
Credit Demand	The firm asked for a loan to finance an investment?
Credit Approval	The credit loan demand has been completely approved

Decision-maker characteristics

Owner	The owner of the firm is the decision-maker
Manager outside the firm	A manager outside the firm is the decision-maker
Manager inside the firm	A manager inside the firm is the decision-maker
Female	Gender of the decision-maker of the firm
15-39 ys	Age of the decision-maker between 15-39 years
40-49 ys	Age of the decision-maker between 40-49 years
50-59 ys	Age of the decision-maker between 50-59 years
more than 60 ys	Age of the decision-maker greater than 60 years
University or higher	University (or higher) level of education of the decision-maker
High school	High school level of education of the decision-maker
Middle/Elementary school	Middle/Elementary school level of education of the decision-maker

Firm characteristics

Firm Age	Age of the Firm
Employees	Number of Employees
Female Employees	Share of Female Employees
Revenues	Amount of revenues
Revenues(log)	Amount of revenues expressed in logarithmic form
North	The firm is located in the North of Italy

Centre	The firm is located in the Centre of Italy
South	The firm is located in the South of Italy
Person/Family major share	One person/One Family owns the major share of the firm
Cassa Integrazione	The firm opts for layoffs
Reduction Employees	The firm opts for a reduction of employees
National group	The firm belongs to a national group
Foreign group	The firm belongs to a foreign group
No group	The firm does not belong to any group

Table 4.5: Descriptive Statistics

	Mean	SD	Min	Max	N
Credit Demand[+++]	0.17	0.38	0	1	20793
Credit Approval[+++]	0.87	0.33	0	1	3568
Decision-maker characteristics[+++]					
Female	0.13	0.34	0	1	20793
15-39 ys	0.06	0.24	0	1	20793
40-49 ys	0.25	0.44	0	1	20793
50-59 ys	0.36	0.48	0	1	20793
more than 60 ys	0.32	0.47	0	1	20793
University or higher	0.29	0.45	0	1	20793
High school	0.52	0.50	0	1	20793
Middle/Elementary school	0.19	0.39	0	1	20793
Owner	0.86	0.34	0	1	20793
Manager outside the firm	0.05	0.21	0	1	20793
Manager inside the firm	0.09	0.28	0	1	20793
Firm characteristics					
Firm Age	26.68	14.98	0	153	20793
Employees	70.34	1052.17	1	144624	20793
Female Employees	0.36	0.32	0	1	20793
Revenues	3.71e+07	1.42e+09	1	1.91e+11	20793
Revenues(log)	14.48	2.05	0	26	20793
North[+++]	0.53	0.50	0	1	20793
Centre[+++]	0.21	0.41	0	1	20793
South[+++]	0.26	0.44	0	1	20793
Person/Family major share[+++]	0.46	0.50	0	1	20788

Cassa Integrazione[+++]	0.17	0.38	0	1	17168
Reduction Employees[+++]	0.06	0.24	0	1	20793
Does the firm belong to a group?[+++]					
National group	0.11	0.32	0	1	20793
Foreign group	0.03	0.18	0	1	20793
No group	0.85	0.35	0	1	20793

REGIONS[+++]

Piemonte	0.07	0.25	0	1	20793
Valle D'Aosta	0.02	0.13	0	1	20793
Lombardia	0.15	0.36	0	1	20793
Trentino Alto Adige	0.04	0.21	0	1	20793
Veneto	0.09	0.29	0	1	20793
Friuli Venezia Giulia	0.04	0.21	0	1	20793
Liguria	0.04	0.19	0	1	20793
Emilia Romagna	0.08	0.27	0	1	20793
Toscana	0.07	0.25	0	1	20793
Umbria	0.03	0.18	0	1	20793
Marche	0.05	0.21	0	1	20793
Lazio	0.06	0.24	0	1	20793
Abruzzo	0.03	0.18	0	1	20793
Molise	0.02	0.13	0	1	20793
Campania	0.05	0.21	0	1	20793
Puglia	0.04	0.20	0	1	20793
Basilicata	0.02	0.15	0	1	20793
Calabria	0.02	0.16	0	1	20793
Sicilia	0.04	0.19	0	1	20793
Sardegna	0.03	0.17	0	1	20793

SECTOR TYPE[+++]

Mining and Energy	0.04	0.21	0	1	20793
Food and Tobacco	0.06	0.24	0	1	20793
Textile, Wood and Publishing	0.07	0.26	0	1	20793
Chemical	0.09	0.29	0	1	20793
Mechanic	0.08	0.27	0	1	20793
Manufacturing	0.06	0.24	0	1	20793
Construction	0.13	0.33	0	1	20793
Commerce	0.13	0.34	0	1	20793
Transportation	0.05	0.23	0	1	20793
Hotels and Restaurants	0.05	0.23	0	1	20793
Information and Media	0.05	0.23	0	1	20793
Financial and Insurance Services	0.04	0.19	0	1	20793
Other Services to Companies	0.07	0.26	0	1	20793
Education, Wealth and Social Services	0.06	0.23	0	1	20793

[+++] Dummy variables.

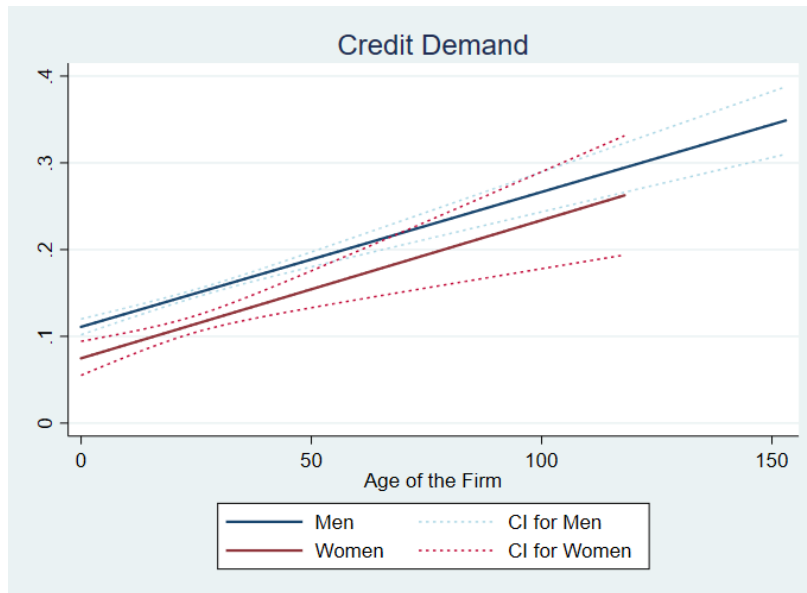## 4.6.2   Graphs

Figure 4.1: Credit Demand
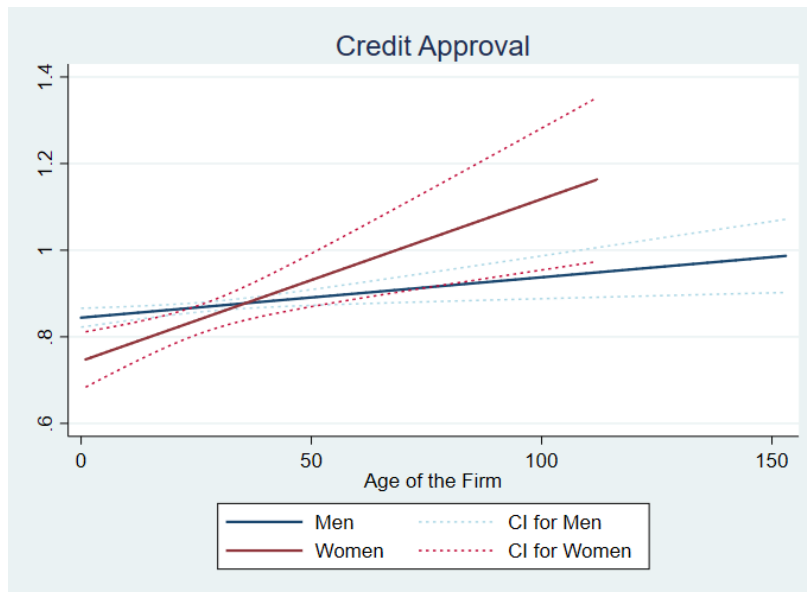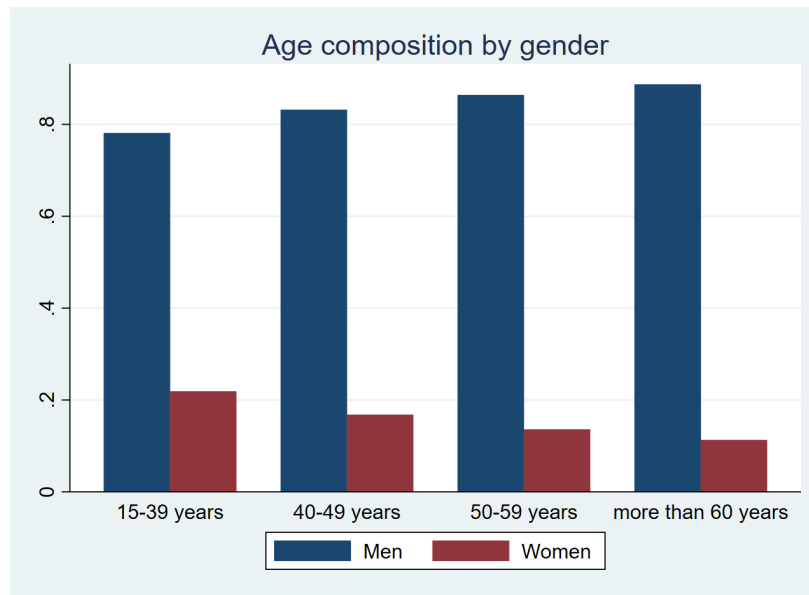

Figure 4.2: Credit Approval

Figure 4.3: Age composition differentiated by gender

4.7 Appendix B - Regression Tables

Table 4.6: Credit Demand and Approval

	Credit Demand	Credit Approval
Decision-maker characteristics[+++]		
Female	-0.0204***	-0.0202
	(0.0075)	(0.0191)
15-39 ys	0.0487***	-0.0646**
	(0.0131)	(0.0288)
40-49 ys	0.0246***	-0.0023
	(0.0074)	(0.0153)
50-59 ys	0.0107*	-0.0191
	(0.0064)	(0.0140)
University or higher	-0.0054	0.0071
	(0.0084)	(0.0176)
High school	-0.0049	0.0189
	(0.0071)	(0.0152)
Owner	0.0539***	-0.0037
	(0.0083)	(0.0216)
Manager outside the firm	-0.0091	-0.0742*
	(0.0143)	(0.0420)
Firm characteristics		
Firm Age	-0.0007*	-0.0001
	(0.0004)	(0.0009)
Firm Age^2	0.0082	0.0001
	(0.0050)	(0.0102)
Share of Female Employees	-0.0437***	-0.0180
	(0.0104)	(0.0245)
Revenues(log)	0.0286***	0.0108***
	(0.0017)	(0.0035)
Does the firm belong to a group?[+++]		
National group	0.0173*	0.0037
	(0.0090)	(0.0167)
Foreign group	-0.1002***	0.0041
	(0.0092)	(0.0417)
N	20793	3557
Legal Status Dummies	Yes	Yes
Regional Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported.

Standard errors in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[+++] Dummy variables.

Table 4.7: Heckman Probit - Coefficients reported

	Credit Approval	Credit Demand
Decision-maker characteristics[+++]		
Female	-0.0170	-0.0878***
	(0.0829)	(0.0338)
15-39 ys	-0.3396***	0.1817***
	(0.0929)	(0.0475)
40-49 ys	-0.0546	0.0964***
	(0.0721)	(0.0296)
50-59 ys	-0.0996*	0.0426
	(0.0564)	(0.0266)
University or higher	0.0467	-0.0197
	(0.0760)	(0.0358)
High school	0.0838	-0.0185
	(0.0635)	(0.0296)
Owner	-0.1628	0.2515***
	(0.1173)	(0.0439)
Manager outside the firm	-0.2613	-0.0382
	(0.1647)	(0.0633)
Firm characteristics		
Firm Age	0.0006	-0.0031*
	(0.0040)	(0.0018)
Firm Age^2	-0.0100	0.0336
	(0.0441)	(0.0209)
Share of Female Employees	0.0285	-0.1792***
	(0.1438)	(0.0428)
Revenues(log)	-0.0215	0.1194***
	(0.0577)	(0.0082)
Branches Region Index		0.0276**
		(0.0112)
North	0.2301	0.0545
	(0.1765)	(0.0479)
Centre	0.1397	0.0481
	(0.1406)	(0.0423)
Does the firm belong to a group?[+++]		
National group	-0.0103	0.0713*
	(0.0751)	(0.0367)
Foreign group	0.3177	-0.5657***
	(0.2369)	(0.0801)
Legal Status Dummies	Yes	Yes
Industry Dummies	Yes	Yes
N	20778	
Censored N	17210	
Uncensored N	3568	
ρ	-0.7233	
	(0.1664)	

Coefficients reported. Standard errors in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4.8: Credit Demand and Approval by Firm Size

	Credit Demand	Credit Approval
Decision-maker characteristics[+++]		
Female	-0.0174**	-0.0264
	(0.0084)	(0.0220)
Medium Firm	0.0691***	-0.0214
	(0.0098)	(0.0169)
Large Firm	0.0473***	-0.0282
	(0.0174)	(0.0331)
Female*Medium Firm	-0.0119	0.0476
	(0.0206)	(0.0316)
Female*Large Firm	-0.0035	-0.0319
	(0.0472)	(0.1085)
15-39 ys	0.0482***	-0.0674**
	(0.0131)	(0.0288)
40-49 ys	0.0243***	-0.0007
	(0.0074)	(0.0153)
50-59 ys	0.0105	-0.0181
	(0.0064)	(0.0139)
University or higher	-0.0072	0.0069
	(0.0084)	(0.0174)
High school	-0.0055	0.0167
	(0.0070)	(0.0151)
Owner	0.0549***	-0.0092
	(0.0085)	(0.0211)
Manager outside the firm	-0.0093	-0.0804*
	(0.0146)	(0.0429)
Firm characteristics		
Firm Age	-0.0007	-0.0001
	(0.0004)	(0.0009)
Firm Age^2	0.0073	0.0005
	(0.0050)	(0.0102)
Share of Female Employees	-0.0441***	-0.0151
	(0.0102)	(0.0246)
Revenues(log)	0.0233***	0.0122***
	(0.0021)	(0.0036)
North	0.0344***	0.0792***
	(0.0066)	(0.0147)
Centre	0.0287***	0.0456***
	(0.0083)	(0.0134)
Does the firm belong to a group?[+++]		
National group	0.0126	0.0076
	(0.0091)	(0.0168)
Foreign group	-0.1051***	0.0085
	(0.0093)	(0.0403)
N	20793	3557
Legal Status Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported.

Standard errors in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[+++] Dummy variables.

Table 4.9: Credit Demand and Approval by Firm Age

	Credit Demand	Credit Approval
Decision-maker characteristics[+++]		
Female	-0.0071	-0.0057
	(0.0130)	(0.0285)
Firm Age below 15ys	-0.0020	0.0363
	(0.0168)	(0.0305)
Firm Age btw 15-30ys	0.0023	0.0335*
	(0.0100)	(0.0200)
Female*Firm Age below 15ys	-0.0001	-0.0242
	(0.0203)	(0.0476)
Female*Firm Age btw 15-30ys	-0.0331**	-0.0045
	(0.0159)	(0.0417)
15-39 ys	0.0477***	-0.0664**
	(0.0132)	(0.0289)
40-49 ys	0.0252***	-0.0020
	(0.0074)	(0.0154)
50-59 ys	0.0113*	-0.0202
	(0.0064)	(0.0140)
University or higher	-0.0069	0.0074
	(0.0084)	(0.0174)
High school	-0.0059	0.0172
	(0.0071)	(0.0151)
Owner	0.0536***	-0.0080
	(0.0086)	(0.0213)
Manager outside the firm	-0.0094	-0.0808*
	(0.0146)	(0.0428)
Firm characteristics		
Firm Age	-0.0007	0.0014
	(0.0008)	(0.0017)
Firm Age^2	0.0080	-0.0082
	(0.0071)	(0.0142)
Share of Female Employees	-0.0418***	-0.0172
	(0.0102)	(0.0246)
Revenues(log)	0.0286***	0.0103***
	(0.0019)	(0.0034)
North	0.0350***	0.0788***
	(0.0066)	(0.0148)
Centre	0.0283***	0.0458***
	(0.0083)	(0.0134)
Does the firm belong to a group?[+++]		
National group	0.0186**	0.0038
	(0.0093)	(0.0167)
Foreign group	-0.1015***	0.0057
	(0.0097)	(0.0408)
N	20793	3557
Legal Status Dummies	Yes	Yes
Industry Dummies	Yes	Yes

Probit estimation model. Marginal effects reported.

Standard errors in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[+++] Dummy variables.

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