

Joint and Individual Savings within Families: Evidence from Bank Accounts.

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Abstract

Are savings evenly distributed and owned within families or do partners within families differ in their wealth? In this paper we investigated the ownership of financial assets within families and how joint savings affect the individual savings of the partners. We used anonymised monthly transactional data from ING Bank from 2014-2016 to observe financial data on Dutch couples. We found that savings were quite equally allocated in almost half of the households, while in the other half it was common that only one partner owned an individual account. The estimations showed that joint savings contributed to a more equal division of savings since they were held equally. However, we found larger differences in individual savings among partners who shared some savings, suggesting that the use of joint savings did not lead to individual savings being more evenly distributed, but rather to the opposite. The pattern was more apparent for households in their 20s and for savings accounts. The results of the study highlight the need for a better understanding of how partners make decisions about applying the sharing rule to joint and individual savings.

Keywords: family, savings, financial assets, allocation of resources, sharing rule, pooling, joint and individual, bank accounts

JEL codes: G51, D13, D14, D31

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Introduction

The extensive literature on intra-household money management confirms that most households do not share or pool all their resources, meaning that they do not share all their income or other resources in a family and do not decide jointly on spending. They use partial pooling (Burgoyne et al., 2007), where some income and expenses are joint and other income and expenses are individual and separate. Sonnenberg (2008) pointed out that individualisation in a family is associated with the partners in a household having greater independence in their money management. Individualisation has been thoroughly investigated in the United Kingdom (Vogler et al. 2006; Pahl 2008; Sonnenberg 2008; Ashby and Burgoyne 2009) and empirical evidence suggests that more households are using partial pooling and that individual holdings of money have become more prevalent (Kan and Laurie 2014). Individualisation is also prevalent in owning a personal car or a mobile telephone, and having personal friends, a personal lifestyle, and a separate job, career, income and spending. Too much individualisation may prevent partners having common interests and goals, and so reduce the stability of their partnership. More independent money management also has an impact on how families accumulate their financial assets, whether jointly or separately. Full pooling of savings implies that both partners have access to the assets accumulated, which equalises income differences between partners. With partial or no pooling, the savings of the partners may become uneven, which has implications for their ability to manage unexpected financial difficulties.

Zick (1992) pointed out the gap in knowledge on intra-household resource allocation and encouraged economists to investigate different aspects of economic and financial issues, but there is still only limited understanding of how financial assets are allocated within families in European countries. One reason for this is that wealth data are usually collected at the household level, which assumes that all resources are jointly owned within a family, whatever the legal ownership of the resources. However, the ownership of assets matters as there are now more cohabiting relationships and married couples may choose a separate property regime. Whether or not household members have access to the financial resources accumulated has severe implications for the financial well-being of the household members.

The aim of this study was to investigate how financial assets are distributed within families and whether partial pooling of savings affects the distribution of individual savings between partners. The main focus of this paper was on how savings were allocated between joint and individual accounts rather than how income and spending were distributed. Although saving behaviour is one aspect of money management and it is closely related to income and spending decisions, how savings are shared may reveal a different picture from how income and spending are shared. Only a few studies have focused on savings and the studies that have investigated the gender wealth gap did not look more closely at the joint and individual ownership of financial assets within families.

This paper is the first to investigate joint and individual financial assets comprehensively by looking at the ownership of all types of savings account. Using bank data gives quantitative evidence on how financial assets are distributed within families. Using 36 months of monthly panel data from 2014 to 2016 lets us analyse the allocation of individual savings by controlling for time-invariant unobserved household characteristics.

Literature review

Several studies have tested the collective model and have confirmed that households do not act as a unit, but household members share household resources. Less is known about the sharing rule. Following from the typology of money management systems developed by Pahl (1983; 1990; 2008), the full pooling system implies full sharing of resources. More interesting cases are the partial pooling system (Burgoyne et al. 2007), in which some family resources are held in one common pot and some resources are held separately, and the independent or autonomous management system, in which household members keep their resources separately and are each responsible for specific expenditures. In the independent management system, the sharing rule determines how resources are divided between partners. In the partial pooling system, household members determine the joint share and the separate individual shares.

Literature on the distribution of resources within families

Several studies have provided empirical evidence that households do not fully share their resources. Kan and Laurie (2014) showed that individual holdings have become more prevalent in UK families since the 1990s. Sierminska et al. (2010) found that among married German couples, men possessed on average 56% more wealth than women, while the wealth gap was 74% among cohabiting partners. They did not find any gap in housing assets because of joint ownership, but observed large differences in other asset types such as financial assets, private pensions and business assets.

The sharing rule for income and consumption has received more attention from researchers than the sharing rule for savings has. Blundell et al. (2007) investigated the sharing rule for income in the UK in 1978-2001 using the Family Expenditure Survey (FES). Their main focus was on the sharing rule for the labour supply, but they also investigated the consumption share of men within families. They found that the man's consumption depended positively not only on family income but also on his own income. The relationship with his wife's income was not precisely estimated.

Cherchye et al. (2015) derived a method for estimating the sharing rule by using data on household income and spending and individual earnings when individual consumption is not known. They estimated the income shares of men and women, as these also reflect the share of household resources consumed by men and women. The method was applied to data from the US Panel Survey of Income Dynamics (PSID), and it was found that men had only slightly larger income shares than women. It was also found that in some households the distribution of resources was quite uneven, as the relative income share of women was less than 15% in a number of households, but there were also households where this share was above 80%. They showed that relative income shares were stable over total income.

Literature on joint and individual savings within families

There is limited quantitative evidence about the shares of savings within families. Treas (1993) investigated the use of joint and separate bank accounts in the US using data from the Survey of Income and Program Participation (SIPP) in 1984. She emphasised the role of transactional costs in the choice

of whether to have separate or joint accounts. Kan and Laurie (2014) explored the probability of individual and joint saving, investment and debt in 1995-2005 in the UK. They divided the sample into non-savers, individual or separate savers, and joint savers, and it is not clear which group households with both individual or separate and joint savings fall into. They found that savings were more common on joint accounts than investments or debts were. Similarly, Lyngstad et al. (2011) investigated the probability of Norwegian households pooling their resources. They used survey data on the ownership of a joint bank account together with a joint decision on large purchases as a measure of pooling and found that cohabiting couples were less likely to pool their income than married couples were.

Two papers have gone beyond the binary indicator for the ownership of the bank accounts and focus on the amounts held by couples. Phipps and Woolley (2008) used data on the Registered Retirement Savings Plans (RRSP) in Canada to compare the retirement savings of couples. They found that the main explanatory variable was income, notably the income of both partners in the amounts held by women for retirement and only the income of men in their retirement amounts. Lee and Pocock (2007) focused on the distribution of financial assets within couples on private bank accounts in South Korea using survey data for 1993-1998. They found that the wife's share in total monthly saving depended mainly on her relative earnings.

All the studies used cross-sectional survey data in which household members reported whether they had separate or joint accounts. We used actual data on the ownership of bank accounts and the longitudinal or panel dimension to control for time-invariant unobserved household characteristics. It is usually easier to collect data on the ownership of different accounts than on the distribution of amounts between accounts, and so no study has focused on the inequality in how resources are divided between partners. We believe that analysing bank data adds new insights into the intra-household allocation of resources, particularly financial assets.

Trends in family arrangements in the Netherlands

The Netherlands stands out among European countries for having the highest share of part-time jobs, as 50% of those in employment in 2015 were working part-time (Eurostat).¹ Among them, 77% of women work part-time, while 27% of men do so. There is a gender pay gap in the Dutch labour market at the average for the euro area of 16% (Eurostat)². Consequently, earnings may differ markedly within a family and it is important to understand how widely the financial circumstances of the partners diverge.

The divorce rate in the Netherlands for first marriages doubled from 19.3% in 1975 to 38.8% in 2017 (Statistics Netherlands)³. The financial situation of the partners after a divorce depends a lot on their financial arrangements during the marriage. Agreement between partners about the ownership of financial assets and goods becomes a crucial issue when there are problems in the relationship.

Marriage has become less popular in the Netherlands over the past 50 years, and the number of marriages registered has declined by 50% since 1970. This trend is more prevalent among younger generations. In 1997, 70% of women and 60% of men were married at the age of 35, while in 2017, 45% of women and 36% of men were (Statistics Netherlands). Cohabitation has become more common in the Netherlands, and about 50% of those who are not married, have a cohabitation agreement (Statistics Netherlands). With the divorce rate rising, it is unromantic but wise for partners to keep some resources separate against the risk of divorce. It is even easier for cohabitating couples to break the bond than it is for married couples.

Financial arrangements between partners in the Netherlands

There are three types of financial arrangement between partners in the Netherlands: (1) complete joint ownership of assets and goods (“community of property”); (2) partial joint ownership of assets and goods (“partial community of property”); and (3) separate financial assets (“marriage settlement”). The second option of partial joint ownership of assets and goods has been the standard option since January

¹ Eurostat database at ec.europa.eu, code [Ifsa_eppga]

² Eurostat database at ec.europa.eu, code [sdg_05_20]

³ The statistics are available from the Statistics Netherlands database <https://opendata.cbs.nl/statline/#/CBS/en/dataset/37425eng/table?ts=1571308829477>

2018. This option promotes partial pooling of new financial assets, while assets that the partners already owned before marriage or cohabitation remain separate. The first option was standard for marriages entered into before 2018 and it is still the most common variant, applying to about 73% of all marriages (Van Raaij et al., 2020). The third option is possible, but has to be specifically arranged by a notary as a prenuptial agreement at the beginning of the marriage or cohabitation. The third option is preferred if one partner owns a company, wants to keep their assets within their own family, or wants to keep assets to leave as inheritance to children from an earlier marriage.

The financial arrangements of marriage apply automatically to a registered partnership, but a cohabiting couple who do not have a registered partnership, can draw up a cohabitation agreement in which they agree on how to divide their property. An increase in the use of prenuptial and postnuptial notary agreements on property division rights can be observed in 2019, both for married and cohabiting couples, and for couples without a registered partnership.

When there is a marriage or cohabitation agreement, all savings can legally be considered joint, whether they are kept jointly or separately. However, as already discussed, there are good reasons to assume that joint and individual bank accounts are treated separately within families, otherwise there would hardly be any reason to hold both joint and individual accounts.

A couple may keep individual accounts for tax reasons. Until 2016, savings and investments above a certain threshold, which was €24,437 in 2016 or double that amount if held with a tax partner, were taxed at 1.2% regardless of the actual returns on the savings (Tax and Customs administration)⁴. The tax system does not force a couple to use individual accounts instead of joint accounts, but if partners do not hold joint accounts for some reason, they are inclined to divide their savings and investments between their individual accounts so that the individual amounts do not exceed the tax threshold.

The deposit guarantee system is another reason for holding financial savings on the individual bank accounts of the two partners. The maximum deposit guarantee for a savings account is €100,000, so if

⁴ The tax rules are provided by Tax and Customs administration at <https://www.belastingdienst.nl>

the total savings of a couple are larger, they may prefer to split the savings between the individual accounts of the two partners to have €200,000 of family savings guaranteed. Another option is to have another savings account with another bank where the same threshold applies. In this way, the deposit guarantee system encourages both partners to keep their savings on their individual accounts.

Dutch couples are able to secure legally the joint ownership of family property. However, a significant share of cohabiting partners do not do this, so it matters for them whose account the savings are kept on. Equally, it is easier for married couples to conceal savings that are kept separately from those of the other partner, and this incentive may be strong when problems arise in the relationship, such as the threat of divorce. This makes it important to investigate how assets are held within a family in general.

Theoretical background

Decision-making for how savings are allocated within households may be considered to follow the same theoretical framework as decision-making for spending, which is described well by Chiappori and Meghir (2015). Savings are resources that have not been consumed, and so are not directly linked to current utility, but rather to future utility and to intertemporal consumption choices, as the aim of saving is to permit future spending and consumption. Therefore we explain a household sharing rule for consumption and saving.

We consider a collective model with two adult household members, who are partners with different preferences and resources. A household consumes joint goods given in a vector Q and individual goods given in a vector q .

Each household member has their own utility function depending on their consumption, but household members also care about other household members. We can express the caring type utility of household member 1:

$$w^1 = (u^1(Q, q^1), u^2(Q, q^2)) \quad (1)$$

The total utility of the household is the weighted sum of individual utilities:

$$U = \mu^1 w^1 + \mu^2 w^2 \quad (2)$$

where μ denotes Pareto weights expressing the weight of the utility of each household member in household welfare:

$$\mu^1 + \mu^2 = 1 \quad (3)$$

If households do not spend all their resources but save some resources either jointly (S_Q) or individually (s^1 and s^2) for future consumption, the budget constraint of a household can be written as:

$$\sum_i P_i Q_i + \sum_j p_j (q_j^1 + q_j^2) + S_Q + s^1 + s^2 = y^1 + y^2 \quad (4)$$

Blundell et al. (2005) introduced the conditional sharing rule, where in the first stage household members decide jointly on allocating aggregate household income, $Y = y^1 + y^2$, to joint consumption and saving, and on distributing the remaining income between household members as individual shares. In the second stage, the members can freely spend or save the shares they have received, conditional on the level of joint consumption and saving decided on in stage one. Hence the sharing rule r determines the distribution of resources between joint and individual consumption and saving:

$$\begin{aligned} \sum_i P_i Q_i + S_Q &= r_Q Y \\ \sum_j p_j q_j^1 + s^1 &= r^1 Y \\ \sum_j p_j q_j^2 + s^2 &= r^2 Y \end{aligned} \quad (5)$$

with the condition for the sharing rule that $r_Q + r^1 + r^2 = 1$.

The sharing rule determines the individual share of consumption and the individual share of savings, and in a model without joint consumption the sharing rule reflects the Pareto weights of individual utilities. However, in a model with joint goods the sharing rule does not explicitly reflect welfare. A model by Chiappori and Meghir (2014) showed that if preferences are different, perhaps if one household member values joint consumption more than the other member does, so $u^1(Q) > u^2(Q)$, it may outweigh the lower share of individual consumption. So that even if $r^1 Y < r^2 Y$, and $u^1(Q) \gg u^2(Q)$, the outcome can be $u^1(Q, q^1) > u^2(Q, q^2)$. We may assume that the preferences for joint or

individual consumption and saving are not extremely different between household members. The caring type utility function implies that the consumption and saving of other household members is important, so an extremely unequal sharing rule is less beneficial for the household than a more equal sharing rule. Both the share in consumption and the share in saving depend on the sharing rule in the family. Savings are mainly accumulated for future spending and consumption, but current consumption might be divided in a different way to joint and individual savings for several reasons. First, the amount of assets accumulated is the outcome of intertemporal consumption and saving choices over a longer time span. Second, if a couple agrees on the sharing rule of income, which also requires a common understanding about joint spending and saving, individual savings may be a residual after individual consumption. So even when the individual consumption shares of partners are equal, their ability to save may be very different. Third, savings are collected to achieve utility in the future, but there must be uncertainty about the composition of the family in the future, which means the division of savings reflects the expectations about joint and separate consumption in the future. The division between joint and individual saving provides a longer-term view about how resources are shared or about the bargaining power over future consumption rather than reflecting the share of current consumption.

Rowlingson and Joseph (2009) showed that household members may perceive the ownership of resources to be different from the actual ownership of accounts. However, Ashby and Burgoyne (2008) concluded that individual and joint saving accounts reflect the actual ownership of the resources. How the ownership of the resources is perceived may change when the relationships in the family change, making it important to get a picture of how resources are accumulated on joint and individual accounts. We focus on financial assets as these are more liquid than real estate assets and so have an important role as a buffer for emergencies and other adverse financial shocks. Moreover, it has been found that home ownership is relatively equal between partners (Sierminska et al. 2010, Meriküll et al. 2021), which is confirmed by the evidence that mortgage loans are mainly joint (Rowlingson and Joseph 2009). This means that the ownership of financial assets provides a valid picture of the sharing rule for assets.

We can derive from theory that pooling also affects the way household members manage their individual resources. When household members agree how much of the household's resources are shared and how much each household member owns individually, the individual share depends on the joint share. The sharing rule, which considers the well-being of all household members, is expected to lead to a more equal distribution of resources.

Hypothesis 1: Partial pooling of savings in a family leads to a more equal distribution of the family's total financial savings.

However, there may be consequences if the partners contribute equal amounts of money to their joint savings, while their individual incomes are very different. Chang (2010) concluded from interviews of married partners in the US that partial pooling may have a negative effect on equal sharing, because if partial pooling means that both household members make an equal contribution despite income differences, the amounts that each has left over for individual use and individual savings may be quite unequal. Huang et al. (2016) noted that those who rely exclusively on a joint account but have partners who have a separate individual account as well are particularly disadvantaged. Pahl (2008) and Vogler et al. (2006) argued that the purpose of independent money management within a household is to give more autonomy and equality, but the actual result may be the opposite.

Hypothesis 2: Partial pooling of savings in a family leads to larger differences in the individual financial savings of the partners in the family.

Data and variables

The dataset

In this paper, we focused on the financial assets of families. These are liquid assets that can be used for consumption when needed, such as deposits and securities. Typically, real estate is the main wealth component of households, and financial assets are a much smaller share of household wealth. The average share of financial assets within the total assets of Dutch households is one of the largest in the euro area at 39%, while the average share in the total assets of euro area households is 29% (ECB 2016).

Liquid assets are important for smoothing unexpected income shocks or for future consumption. There is evidence that the family residence is usually owned jointly, while the ownership of financial assets may be more diverse (Sierminska et al. 2010). We used transactional data from ING Bank covering 36 months in 2014-2016. We consider the information about which account savings are accumulated on to be a good proxy for how savings are shared, as those savings can only be used following a joint decision for a joint bank account, or independently and without the consent of other household members from individual bank accounts.

We used a random subset of anonymised ING Bank customers in the Netherlands.⁵ Although the customer base is not representative of the Dutch population, the sample consisted of customers under different economic conditions and so it gives a good picture of how resources are allocated by households from different socioeconomic groups with two working-age adults. The advantage of using the bank data is that there were no missing values for the variables used in the analysis.

In our sample, a household consists of two adults aged between 18 and 70 and living at the same address. The age difference between the two adults should be smaller than 15 years, indicating that the household members in the sample are probably a couple. The dataset on the households contains information about the ages of both household members. We calculated household income as the median of monthly inflows in the past seven months. Monthly inflows compile all inflows from outside the bank into the checking accounts of all household members within a month. We used the household income level to analyse the differences in sharing rules across economic conditions. Information about the number of children in the household under the age of 18 has been used to investigate how the number of children affects the distribution of financial assets.⁶

As households may have joint or individual accounts for different products, we used the data on all accounts where households can accumulate their financial assets, which are checking, saving,

⁵ The research was conducted under Think Forward Initiative project grant, and an agreement to access the anonymised bank dataset was part of the project. Data processing for scientific purposes was used in compliance with the General Data Protection Regulation.

⁶ Since the data on children are collected indirectly, some data may be missing. This would lead to lower estimates.

investment and pension accounts. A checking account is meant for daily transactions and households are expected to use other accounts for saving purposes. Although interest rates were low during the sample period, data from the Household Finance and Consumption Survey (HFCS) from 2013 and 2017 reveal that the majority of households hold their savings on deposits instead of shifting to riskier assets with expected higher returns. Table A.1 in the Appendix confirms that households hold considerable amounts of their assets on checking accounts, implying that checking accounts are also used for saving. The product-related dataset contains data for each product type, which are checking accounts, saving accounts, investment accounts, and pension accounts. Each product type has been divided into individual and joint accounts. A joint product is defined as a product where both household members own the account. We observe the balance of individual accounts for both household members.

The third monthly transaction dataset provides monthly inflows into and outflows from individual and joint checking accounts, making it possible to analyse income and spending from the joint and individual checking accounts. The resources for all the other joint saving and investment products are transferred from joint checking accounts. Pension accounts are all individual accounts.⁷

Where the income of a household member is transferred directly to the joint account, which is a common practice, we were not able to identify the income of each partner separately as we did not know whose income is being transferred to the joint account. However, we were able to observe the individual incomes of members of households that only use individual accounts.

Transactional data are volatile as they contain extraordinary transactions from transitory or extraordinary income or spending, so we used three-month smoothed average values for the inflows and outflows and for the balance of the accounts. Additionally, we excluded observations with the highest 1% of values in the balance of total financial assets for both inflows and outflows.

⁷ The ownership of pension accounts is very small because the data cover only voluntary defined contribution pension schemes, but the majority of voluntary pension schemes are in life insurance (HFCS 2017). Additionally, pension assets are only individual. However, we included these pension assets in the analysis as they can be liquidated when needed, contributing to the individual financial assets.

Measures of individual financial assets

We computed the main variables of interest by measuring how individual financial assets were allocated between the two partners from the balances of any saving account.

We calculated the shares of the individual financial assets of the two partners for each month as:

$$Share_{it}^{Tot} = Bal_{it}/(Bal_{it} + Bal_{kt} + Bal_{jt}) \quad (6)$$

where Bal_{it} and Bal_{kt} denote the balances of the total individual accounts of household members i and k respectively, summing up the balances of their checking, saving, investment and pension accounts at the end of month t . Bal_{jt} denotes the balance of the joint accounts, summing up the balances of the checking, saving and investment accounts at the end of month t . As explained in the data section, all the balances at the end of the month are three-month smoothed average values.

The share expresses the individual ownership of the assets by one partner as a share or proportion of total financial assets and reflects the outcome of the sharing rule given in equation (5) for the allocation of savings. The share indicates how independent each household member is in their savings. However, this measure does not capture the allocation between partners, because if the majority of assets are held on joint accounts, the individual share is small for both partners, since $Share_2 = 1 - Share_j - Share_1$. To assess the distribution between the partners, we calculated a share of the assets of each household member only from the *private* or individual financial assets of the household at the end of month t :

$$Share_{it}^{Priv} = Bal_{it}/(Bal_{it} + Bal_{kt}) \quad (7)$$

This measure indicates the distribution of individual financial assets between the partners. The share calculated is the same for households without joint financial assets, while in the families with joint accounts, the second measure indicates how equally the *individual* financial assets are distributed. This gives a better picture of whether individual assets are distributed equally, similarly to joint assets, or

unevenly, as pointed out by Chang (2010). For example, if one partner has a small share, it directly indicates that the other partner must have a large share, since $Share_2^{Priv} = 1 - Share_1^{Priv}$.

To model the relative *differences* between the household members, we compute a measure of the difference between the individual shares of the partners. The difference has been estimated as a proportion of the three-month smoothed average at the end of month t for total assets:

$$Diff_{indiv,t}^{Tot} = \frac{|Bal_{it} - Bal_{kt}|}{(Bal_{it} + Bal_{kt} + Bal_{jt})} \quad (8)$$

This measure gives the proportion of unequally distributed assets in total assets. So if one partner owns, say, 30% of the family's assets on their account and the other also owns 30%, while 40% of the total financial assets are held on a joint account, the difference between the partners is 0. But if the distribution of the financial assets is 30%, 0% and 70%, the difference between the partners is 30%. In the second example, the information about the drastic difference between the individual accounts of 30% against 0% is not explicitly captured, and so we compute an additional measure as a proportion of the separately held financial assets:

$$Diff_{indiv,t}^{Priv} = \frac{|Bal_{it} - Bal_{kt}|}{(Bal_{it} + Bal_{kt})} \quad (9)$$

If the proportions for the private assets of the partners are 100% and 0%, the difference between the partners is 100%. This measure reflects the difference in the savings shares of the household members.

The measures calculated by equations (6) and (8) are related to hypothesis 1. The first insight about the distribution of total assets is given by the shares of the individual financial assets of the two partners within the total financial assets of the family. As a second step, we estimated the model to test the first hypothesis, using the difference between the individual shares of the partners calculated by equation (8) as a dependent variable. Similarly, the share of individual financial assets of each partner within total private or individual assets calculated by equation (7) gives a first insight into hypothesis 2. We tested the second hypothesis with a regression model where the difference between the individual shares of the partners calculated by equation (9) was used as a dependent variable.

Variables measuring pooling

We used two different variables to indicate pooling, a binary variable and a continuous one. If a couple has a positive balance on any of their joint accounts, or if there are inflows into or outflows from joint checking accounts, we considered this to be a couple with some pooling of resources, $Pool_{jt} = 1$, while otherwise $Pool_{jt} = 0$.

Additionally, we computed a continuous variable for pooling that denotes the extent of joint financial assets as a share of total financial assets:

$$Share_{jt} = Bal_{jt} / (Bal_{it} + Bal_{kt} + Bal_{jt}) \quad (10)$$

The range of the variable is 0-1, where it is 0 if no financial assets (0%) are held on the joint account and 1 if all assets (100%) are held on the joint account.

Control variables

In the statistical analysis and the regression models we used the ages of both household members, household income, and the number of children as categorical variables. The age groups were defined as 18–29, 30–39, 40–49, 50–59, and 60–70. We categorised the number of children as zero, one, two, three or four, and five or more. The income groups were defined as monthly household income of up to €999, €1,000–1,999, ..., €5,000–5,999, and more than €6,000, calculated as the median household monthly inflow during the past seven months. The asset groups were defined as the household balance for total financial assets of up to €1999, €2,000–4,999, €5,000–9,999, €10,000–19,999, €20,000–49,999, €50,000–99,999 and more than €100,000. The summary statistics of the measures that we used to compute the dependent variable, pooling variables and control variables are provided in Table A.2 in the Appendix.

Empirical Modelling and Results

Statistical analysis

We compared how individual accounts were used by non-pooling households without joint accounts and by households with joint accounts. In the sample, 40% of households have full pooling and only used joint accounts over the sample period, 12.5% use only individual accounts, and the others, 47.5%, use both individual and joint accounts in partial pooling. We did not analyse couples without individual accounts in households with full pooling, as we were focusing on the use of individual accounts.

We give the mean values for different financial measures for the households that pool and for those that do not pool in Table 1. As we focused on the distribution of individual financial assets, we investigated the subsample that has a positive balance on any of the individual accounts.

Panel (b) of Table 1 shows that financial assets held separately are quite disproportionately distributed. The average gap in financial assets, as given by equation (8), is 38% between non-pooling partners. This means that on average one partner holds 31% of the total financial assets on their account, while the other partner holds 69% on their account. The gap for households using joint accounts is somewhat lower at 32%, meaning that if one partner holds 12.5% on their individual account, the other holds 44.5% on their individual account, and the remaining 43% is held on joint accounts, as the average share of joint financial assets is 43%.

Table 1. Mean statistics of the main measures for pooling and non-pooling households

	Households:	
	Non- pooling	Pooling
<i>(a) Total balance</i>	27,278	30,233
Total individual balance	27,278	17,981
Total income (inflow)	4,877	5,045
Total spending (outflow)	3,045	3,121
<i>Difference on individual accounts:</i>		
Absolute difference in individual fin. assets	8,602	8,939
<i>(b) Difference as the share of total resources (equation 8):</i>		
Financial assets	0.382	0.317
Income (inflow)	0.323	0.374

Spending (outflow)	0.366	0.373
<i>(c) Difference as the share of individual resources (equation 9):</i>		
Financial assets	0.382	0.631
Income (inflow)	0.323	0.542
Spending (outflow)	0.366	0.549
<i>(d) Share of resources owned by women (equation 7):</i>		
Financial assets	0.486	0.509
Income (inflow)	0.466	0.545
Spending (outflow)	0.454	0.545
Number of observations in the sample	39,801	162,447

For the financial assets held individually as given by equation (9) and shown in Table 1 panel (c), the average gap in individual financial assets is substantially larger for households that pool, as it is 63% of all the individual assets. When one partner has 18%, the other has 82% of individual financial assets. The differences between individual income and spending are also large at 54% for individual income and 55% for individual spending, but this difference is smaller than that for financial assets. Financial assets accumulate over time, so small differences in ongoing saving end up producing large differences over a long period.

Table 1 section (d) shows the mean shares of financial assets, income and spending held by women in households when the share is calculated using equation (7). The average share in the sample of financial assets held by women is 50%, and there is no economic difference between pooling households and non-pooling households.

Distributional differences between non-pooling and pooling households will provide more interesting insights. Figure 1 panel (a) shows that in almost 50% of the non-pooling households, men and women own equal amounts on their individual accounts. In pooling households, both women and men own less of the total financial assets because some of the assets are joint.

Share of woman's individual financial assets in a family



Figure 1. The share of households with the given share of individual assets of women in the total financial assets calculated by eq. (6) in panel (a) and in individually held financial assets calculated by eq. (7) in panel (b).

Figure 1 panel (b) reveals that in half of the partially pooling households, one partner does not own any individual assets. There are small gender differences in favour of women in pooling households, since in 23% of these households women do not own any individual assets, but in 25% of them men do not own any individual assets. Among non-pooling households the difference is marginally in favour of men, as in 8% of these households women do not own an individual account, while in 5% of them men do not own an individual account.⁸ Interestingly, a similar finding that women are not disadvantaged in a family in access to individual goods and services was found by Cantillon et al. (2016), who investigated individual deprivation among Irish couples.

Treas (1993) provided some statistics on how US couples use joint and separate accounts. The statistics were from the SIPP survey of 1984 and the long time gap makes the comparison challenging. She showed that in one third of the couples with only separate bank accounts, who were 18% of the sample

⁸ Regression estimations on the share of individual savings held by women or men showed that neither gender benefitted systematically from pooling. The variable indicating pooling was not statistically significant, whether the binary or continuous variable was used (not reported).

compared to 12.5% in our sample, both partners owned an account, in one third of them only the husband had an account, and in the other third only the wife had an account. In one fifth of the couples that used partial pooling, who were 17.6% of the sample compared to 47.5% in our sample, both partners owned an individual account, in a quarter of the cases only the husband had an individual account, and in over half of the couples only the woman had an individual account. In our sample, the cases where both partners have an individual account are more common, as having a bank account is also more common now than it was in the 1980s, though the gender differences in favour of women also seem to be present in our sample.

The 0% or 100% share means the other partner has the opposite amount. As we found that the gender differences were marginal, we looked at the difference in the individual shares of the partners without focusing on gender, given by equations (8) and (9). In Figure 2 panel (a), we observe that the individual assets within total financial assets are distributed evenly in almost 50% of the households, and the gap in individual financial assets is less than 20% of the assets. However, in a substantial number of households the assets are very unevenly held on individual accounts, since in almost one quarter of non-pooling households, the gap is over 80% of total assets meaning that one household member holds most of the financial assets. In pooling households, the fraction of households with a very uneven split of financial assets is small at 8%. This statistical finding is in line with hypothesis 1 and the finding is expected because some of the assets are held on joint accounts, implying an equal distribution. For the distribution of individually held financial assets, the picture is more striking. Panel (b) reveals that in over 50% of pooling households, one household member holds most of the individual assets, supporting hypothesis 2.

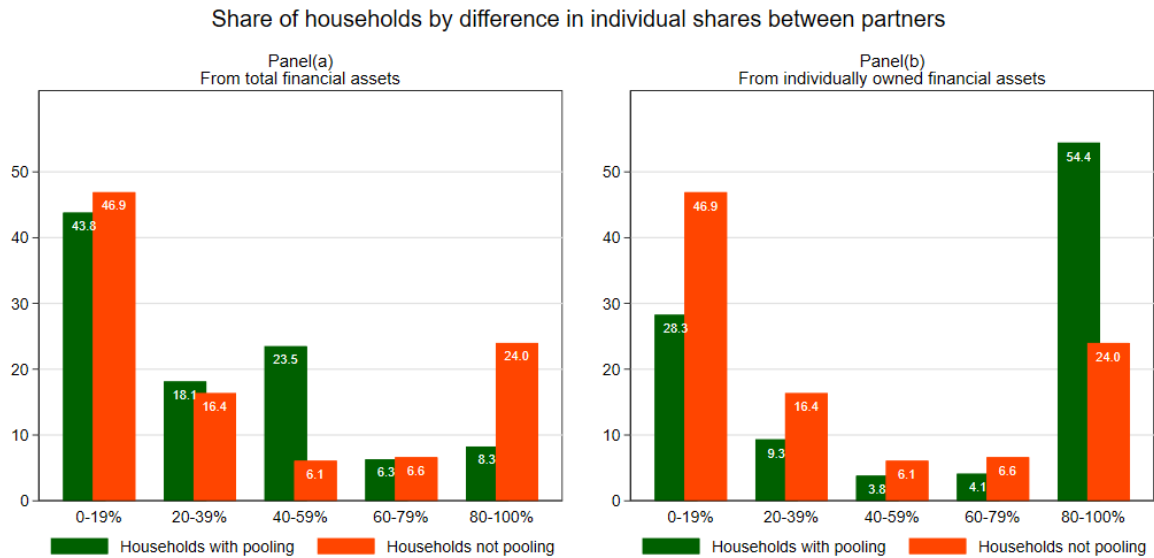


Figure 2. The share of households with the given difference in individual assets from total financial assets calculated by equation (8) in panel (a) and from individually held financial assets calculated by equation (9) in panel (b).

One explanation for why only one partner owns an individual account, is that the other partner may be using the joint account more actively. Kenney (2006) analysed money management-control systems and showed that it is common for the joint account to be controlled by one partner, more often the woman than the man. Apparently, the partner who controls the joint account does not need to have a separate account. However, this explanation applies better to everyday money management than to savings. It is less obvious that savings on the joint account would be considered to be owned by one partner.

The empirical model

To investigate how the use of joint accounts together with household characteristics relates to the larger gap in individual savings that we saw in Figure 2, we estimated a fixed-effects (FE) model in which the dependent variable is the difference in individual shares relative to total financial assets, the measure given in equation (8). In the alternative specification the dependent variable is the difference in individual shares relative to total individual assets, the measure given in equation (9). The model specification is as follows:

$$y_{it} = \theta P_{it} + \sum_{k=1}^4 \alpha_k AGE_{it} + \sum_{k=1}^4 \beta_k CHLD_{it} + \sum_{k=1}^6 \gamma_k INC_{it} + \sum_{k=1}^6 \delta_k FA_{it} + u_i + \tau_t + \varepsilon_{it}, \quad (11)$$

Our focus was on the estimated coefficient θ that expresses the relationship of pooling to the difference in individual savings, as calculated by equation (8) to test hypothesis 1 and by equation (9) to test hypothesis 2. The estimated α_k captures the relationship between the gap in individual assets and each age group of men and women in comparison to the gap for the base age group of 18–29. The coefficient β_k captures the association with the number of children expressed in four groups in comparison to the association for the group without children. The estimated coefficient γ_k captures the relationship with income groups relative to that of the base group with income of up to €999. The coefficient δ_k expresses the relationship with six categories of total household financial assets. Several fixed effects are included as u_i denotes household effects and τ_t denotes the monthly fixed effects, while ε_t is the error term.

For the models with two different dependent variables, we ran two regressions, one with a binary pooling variable that was 1 when a household had any inflows into or outflows from the joint checking account or a positive balance on any joint account, and a second with a continuous variable denoting the share of joint financial assets calculated as in equation (10).

In the fixed-effects model, we used the within-household variance over the time dimension to estimate the coefficients. This means that the time invariant unobserved characteristics that may correlate with the explanatory variable and may also affect the accumulation of financial assets, do not bias the estimated coefficients. Time-fixed effects capture the aggregate shocks to financial assets.

As discussed in the section on theoretical background, households that share joint savings may apply a more equal sharing rule for their savings, but sharing joint savings may leave individual savings less equal if households focus and agree only on their joint savings. When households keep some savings jointly, the differences in individual savings are expected to be smaller, meaning that θ is negative since the caring-type household members would benefit from a more equal division of the resources. If the differences in individual savings are larger, the estimated coefficient θ is positive.

Baseline estimations

The estimations with the fixed-effects model confirm the statistical findings from the previous section. The estimated coefficients for the pooling variable are presented in Table 2 in column (1). The more households hold on their joint accounts, the smaller the difference between partners is on their individual accounts as a share of total financial assets (equation 8). On average, if the share of total financial assets on joint accounts is 10 percentage points higher, the difference on individual accounts is 6.1 percentage points smaller. The finding of a smaller gap in individual savings as a share of total savings is not surprising given that partners share joint accounts equally. This implies that the more the partners shift to joint accounts, the smaller the share of assets is on the individual accounts of both partners. The result confirms the first hypothesis that pooling leads to a more equal distribution of savings.

We used the same model specification to compare the results for the gap in individual financial assets with the results for the gap in individual income and spending. The estimated coefficients for the pooling variable are given in Table 2 columns (2) and (3) in panel (a). The differences in the income in individual accounts and spending from them is not negatively associated with pooling but rather positively so. The binary pooling variable is statistically insignificant and the continuous pooling variable is positive, but the small estimated coefficients indicate a marginal economic significance, as the share of joint income being 10 percentage points higher implies a difference in individual shares that is 0.45 percentage point larger, and 10 percentage points more spending gives 0.42 percentage point more difference. We may conclude that income and spending tend to have a similar sharing rule, as the estimated coefficients are similar, but the sharing is different for accumulated savings.

Table 2. Estimations for the relationship between pooling and the difference in the individual share of financial assets in a family

	(1) <i>Financial assets</i>		(2) <i>Income (inflow)</i>		(3) <i>Spending (outflow)</i>	
	Pool (binary)	Share on joint account	Pool (binary)	Share on joint account	Pool (binary)	Share on joint account
(a) Share of total balance	-0.114*** (0.020)	-0.613*** (0.011)	0.008 (0.016)	0.045*** (0.009)	-0.012 (0.015)	0.042*** (0.009)
Adj. R ²	0.110	0.124	0.283	0.284	0.247	0.248
No. of groups	6,389	6,389	5,464	5,464	5,463	5,463
No. of observations	204,534	204,534	160,514	160,514	160,390	160,390
(b) Share of private balance	0.134*** (0.023)	0.143*** (0.012)	0.064** (0.022)	0.098*** (0.013)	0.047** (0.021)	0.093*** (0.013)
Adj. R ²	0.098	0.128	0.207	0.209	0.180	0.182
No. of groups	6,389	6,389	5,464	5,464	5,463	5,463
No. of observations	204,534	204,534	160,514	160,514	160,390	160,390

Notes: FE estimations of equation (12). All explanatory variables and monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.

** p < .01. *** p < .001

Comparison of the difference between the financial assets on individual accounts as a share of the total *individual* balance (equation 9), meaning comparing only the savings that are held separately, showed that these funds were *more* unevenly distributed for couples who used joint accounts (Table 2 panel (b)), confirming the second hypothesis. When the share of joint savings increases by 10 percentage points, the difference in individual shares increases by 1.4 percentage points. Similarly, income going into individual accounts and spending from individual accounts are found to be more uneven when the household uses both individual and joint accounts. However, the gap in income and spending is somewhat narrower for pooling than the gap in savings is, as increases of 10 percentage points in the share of joint income and in the share of joint spending are associated respectively with increases in the gap between individual shares of 1 percentage point and of 0.9 percentage point. This implies that small differences in the individual flows may end up as somewhat larger differences in the individual accumulated funds.

The estimated coefficients for all the variables in the model are given in the Appendix in Tables A.3 – A.5. For the other control variables, we were not able to detect the relationships of age, number of children and income with the differences in the individual financial assets (Table A.3 in the Appendix). However, comparing the results with those from the regressions where the difference in individual spending and the difference in individual or non-pooled income is the dependent variable indicates that the distributions of income and spending are more strongly related to household income than the distribution of financial assets is (Appendix Table A.4 and Table A.5). With a rise in household income, the difference in non-pooled income and individual spending declines.

The differences between partners in the individually held assets is smaller when the household owns less than €5000, and the assets become more equally distributed between the individual accounts of the partners when the financial assets exceed €100,000. This applies for the differences both relative to total financial assets and relative to individually held financial assets. The tax threshold on savings and the deposit guarantee system may explain the smaller differences in families with large amounts of financial assets. As explained in the literature review section, the tax system and the deposit guarantee encourage large savings on individual accounts to be held more equally.

Robustness estimations

One explanation for the larger gap in individual savings could be that the difference between individual accounts for total financial assets on individual accounts seems to be larger because households with pooling have smaller amounts on their individual accounts, as seen in Table 1. A small absolute difference may end up as a large relative difference. However, this explanation can be ruled out by additional robustness checks that we did to control for the financial assets on individual accounts instead of total financial assets. For households with the *same* amount of assets on *individual* accounts, households with pooling tend to have more unbalanced individual funds between partners (Appendix Table A.6 column (1)).

We also investigated how much the results were driven by the extreme differences, since we observed that in a substantial proportion of households only one household member owned an individual account.

If some of the other household members hold individual accounts with other financial institutions, our results about the differences may be biased. We were not able to detect which household members may have another account outside the sample. As the FE model uses within household variation, the estimates are only biased if the decision to pool is also linked to shifting some individual savings into another institution, which does not seem plausible.

Nevertheless, we ran additional estimations to address this. We did the estimations for a sub-sample without households where one household member did not have an individual account, which means we also excluded those households in which one member did not truly own individual savings. This sub-sample would have provided a very conservative, or downward biased, estimate. The estimations are provided in the Appendix in Table A.6 column (2). We still got statistically significant estimates, although as expected they were slightly lower, and this indicates that more pooling is related to larger differences in the savings accumulated on individual accounts. The results presented in Table 2 are not driven by extreme cases where only one household member holds individual assets. The pattern is similar for households where both partners hold individual assets.

The estimations in the Appendix Table A.6 column (2) also rule out another explanation, which is that families with partial pooling consider individual savings to be joint and they keep only one individual account for convenience. We still see that in families where both partners have an individual account, the amounts on those accounts differ significantly when there is a joint account.

We ran additional robustness estimations for the differences in net financial assets, which we got when consumer loans and credit card debt were deducted from financial assets. The results remained the same as in the baseline model (Appendix Table A.6 column (3)). We see that the result that pooling is related to larger differences in individual assets between partners is robust to different model specifications. The first set of estimations in Table 2 show that the use of joint accounts makes the distribution of savings more equal as joint savings are owned by partners equally. But joint savings lead savings on individual accounts to be more diverse. Apparently there is a re-distribution of resources within the family that results in uneven individual savings.

Estimations by age groups and product types

We also investigated the relationship between pooling and individual financial assets in sub-groups. Individualisation has evolved over time, suggesting that young age groups are more individualistic in their money management. We defined the age group from the age of the oldest household member at the beginning of the period. Indeed, statistics in Table 3 columns (1) – (5) show that the younger the age group in the sample is, the smaller the share of joint assets is. Although the gap in individual savings is lower for younger age groups, in the panel estimations we found that age is not related to the gap in the individual assets, suggesting that families do not change their sharing rules over time and there is a cohort effect.

Table 3. Mean statistics of the measures, by age groups and by product types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Age up to 29	Age 30-39	Age 40-49	Age 50-59	Age 60-70	Checking account	Saving account	Investment account
Share of couples pooling	0.755	0.818	0.802	0.788	0.821	0.793	0.580	0.370
Share of assets on joint account	0.244	0.314	0.319	0.356	0.426	0.390	0.330	0.320
Difference between individual accounts, as a share of total resources	0.270	0.314	0.340	0.352	0.342	0.270	0.373	0.075
Difference between individual accounts, as a share of individual resources	0.398	0.517	0.562	0.635	0.704	0.480	0.515	0.079
No. of groups	391	1418	1959	1347	1269	5703	5621	694
No. of observations	13,197	47,570	64,218	42,358	37,142	187,289	171,472	17,952

We linked the pooling of resources to the differences in individual assets by estimating equation (11) for each age group separately. The estimated coefficients for pooling are shown in Figure 4 and also in the Appendix in Table A.7. Estimations by age groups in Figure 4 panel (a) reveal that pooling is most strongly associated with the gap in individual savings for couples in which the oldest household member is in their 20s. The relationship between pooling and the gap is substantially weaker for households aged over 30, and is not present in households aged over 60. Although age is not related to the gap in individual savings, it seems to play an indirect role. The results may reflect generational differences

rather than age. Younger age groups are apparently more individualistic, a cohort effect pointed out by Kukk and Van Raaij (2018), and the purpose of pooling does not seem to be related to the equality within a family, especially among households aged below 30.

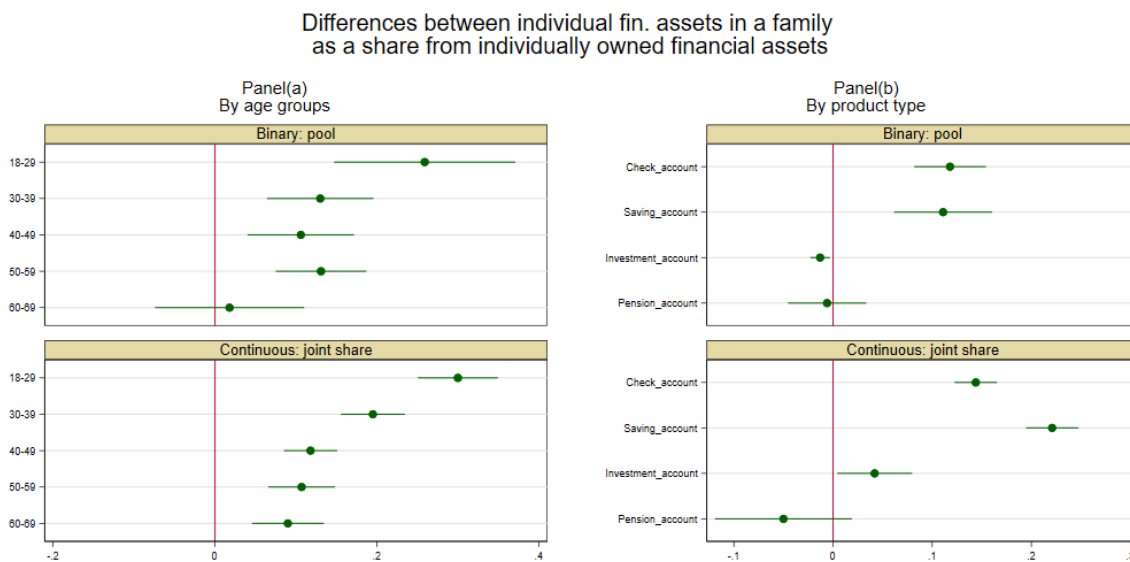


Figure 3. The estimated coefficients of the FE model of equation (11) are shown with 90% confidence intervals. Other explanatory variables and monthly time dummies are included in the model, but not reported here.

If the partner who is responsible for everyday money management, is using the joint account while the other partner owns an individual account, the differences in financial assets may be driven by everyday finances rather than by actual savings. Therefore we distinguished between different types of account in further estimations. The primary goal of checking accounts is everyday money management, while money is transferred to saving accounts, investment accounts and pension accounts for different saving purposes. Saving accounts are more commonly used for short-term saving, while investments usually take a longer perspective. Table 3 columns (6) – (8) reveal that pooling on a checking account is the most prevalent but the differences between individual balances are largest for saving accounts.

We carried out another set of regressions of equation (11) by product type. The estimations for all product types are presented in Figure 3 panel (b) and also in the Appendix in Table A.8.⁹ We see that pooling is most strongly associated with the differences in individual assets on saving accounts, while no relationship is observed for individual investment and pension accounts. On average, when the share of joint assets increases by 10 percentage points, the difference between individual saving accounts increases by 2 percentage points. Given that 96.7% of households in the sample own saving accounts, while only 12.3% have investment accounts and 0.8% pension accounts, the strongest relationship between pooling and individual assets is for the most common type of account. The upshot of the estimations is that pooling does not seem to help create a more balanced allocation between individual financial assets. On the contrary, individual assets are less evenly distributed with partial pooling.

The strong relationship of the individual saving gap to the joint savings in the young age group suggests that couples may focus on their contributions to joint savings and less on their individual savings. Individualisation implies that both partners want to decide on their own about their individual savings, leading the partners to take rather different positions. The large difference is seen for the accounts on which the largest share of savings is kept, which are the checking and saving accounts.

Discussion and implications

We found that in almost 50% of households that do not use full pooling, the individual assets within total financial assets are distributed quite evenly. The panel estimations showed that the larger the joint savings are, the smaller the gap is in individual savings within total savings, as joint savings are owned by the partners equally. Hence joint savings imply there is less inequality in the savings of a family. This finding confirms the first hypothesis that partial pooling of savings in a family leads to a more equal distribution of the family's total financial savings. As presented in the section on the theoretical background, household members are caring-type and the welfare of household members depends not

⁹ Although pension accounts are not held jointly, it is possible to estimate the difference in the shares of individual balances and how pooling is linked to the gap for any other products.

only on the welfare of each person individually, but on the welfare of all the household members. The caring is expressed by the use of joint accounts.

But we also found that in surprisingly many families with partial pooling one partner does not own an individual savings account apart from the joint account. In 24% of non-pooling households, one household member holds most of the individual financial assets, while in 54% of the partially pooling households, one partner holds most of the assets. When we investigated individual savings with the panel model, the estimations revealed that the more savings there were on joint accounts, the larger the difference was between the amounts on individual accounts as a share of all individual savings. An increase of 10 percentage points in the share of joint savings is related to an increase of 1.4 percentage points in the difference between the individual shares. This confirms the second hypothesis that if partners focus on the equality of joint accounts while neglecting individual accounts, partial pooling of savings leads to larger differences in the individual financial savings of the partners.

We found that the negative relationship between pooling and individual savings is larger than the relationship between pooling and individual spending. There seems to be a similar sharing rule for income and spending, but the sharing is different for accumulated savings. These results suggest that in the first stage of the conditional rule, described in the theory section, partners allocate aggregate household resources to joint and individual consumption and saving. In the second stage, partners decide independently on their individual consumption and saving, which may hold only to some extent. In the first stage, they seem to agree on the joint amount while neglecting individual shares. Partners apparently decide independently on how to use their individual shares, how much to consume and how much to save, leading to unequal distribution of individual savings.

We cannot detect whether the difference between the individual savings is caused by the contributions to joint expenses being equal, which would leave larger differences in individual resources. Ashby and Burgoyne (2009) found that making an equal contribution is as common in the UK among households that use independent money management at 75% as it is among those that use partial pooling, 72% of which do it. The finding that more pooling corresponds to a larger gap in individual savings indicates

that the share of individual saving of the partners might not be agreed between them. If they focus on the contributions to joint accounts, their individual saving may not be directly managed and may come from the remainder left after individual consumption. Lee and Pocock (2007) found that the division of savings in South Korea is not determined together with total savings. If individualisation leads to partners having individual savings besides the joint savings while the amounts are not agreed with the partner, the accumulation of individual savings may be divergent within a family. It would be worth exploring the decision process for joint and individual savings to understand why the distribution of individual savings is unbalanced.

There is empirical evidence in the literature of a gender gap for heterosexual couples. Despite the prevalence of part-time jobs for women and the gender wage gap in the Netherlands, we did not find any systematic gender differences in individual savings. There are equal numbers of men and women who do not own the individual financial assets in a family, so that on aggregate they hold equal shares of the financial assets. Woolley (2003) found that in Canadian households, men's earnings were more likely to be kept on joint accounts and women's earnings on separate accounts. This might also be the case in the Netherlands, and that would offset, to some extent, the earning gaps, resulting on aggregate in men and women having equal shares despite the large differences at the individual level. The statistical analysis showed that in pooling households there are slightly more households where women hold a separate account, while among non-pooling households the opposite is the case. Women might benefit from sharing in a family that uses joint accounts, where the differences in individual savings are driven by factors other than the income gap.

Age may have the life-cycle effect that couples in a relationship of increasing duration change their financial behaviour to have more joint savings or to use more role specialisation and division of work in financial management. However, we found only generational differences as young cohorts are more individualistic than older ones. This may result in a more separate regime for assets and a lower level of income pooling, and thus to more unequal access to family financial assets. Individualisation is likely to increase in society, leading to less or no pooling of savings on joint accounts, less joint ownership of

property, and less equal access of partners to family resources. If this leads to less joint financial decision making and choice, more financial mistakes may be made with reduced financial well-being as a result.

Our estimations show that when young households pool more of their savings, the distribution of individual savings between partners becomes more uneven. In order to disentangle cohort and age effects precisely, more longitudinal research is needed to test the hypotheses about how age and relationship duration affect the distribution of financial assets in families.

Less pooling of the income or savings of a couple does not necessarily mean that partners do not agree on and contribute to joint expenses such as spending on children, the home and holiday trips. In this study, we observed the ownership of joint and individual savings from bank data. A couple may have enough mutual trust that they do not feel they need to identify joint resources explicitly. This may explain why we did not find gender differences. However, spending from an individual account is controlled by the owner of the account, giving them more power in the family. As long as there is a good relationship between the partners, this is not a problem, but in cases of conflict and potential divorce, it becomes a problem. The divorce rate has increased in the Netherlands, as it has in other European countries. Agreement between partners on the ownership of financial assets and property then becomes a crucial issue. The regulations on financial arrangements promote a cohort effect of generational differences between full and partial pooling of financial assets.

Partial pooling implies increased financial well-being, as joint savings contribute to the equal distribution of savings. At the same time, the fraction of savings that is held individually becomes more unevenly distributed. Full pooling would be the way to achieve equality of all assets, but this is counteracted by the present trend of individualisation and autonomy.

While full pooling is not used by young couples, other ways to promote a more equal distribution of savings have to be found. One way is that partners agree to keep the same amount of income on their individual accounts, and to transfer the other part of their income to the joint savings account. Another way is to use financial planning of expenditure with clear-cut agreements between the partners on who is paying for which specific expenditure categories, such as paying for the home, for children, for

holidays, and for eating out. In this way, spending will be proportionally allocated to the personal income of the partners. This may result in the savings of both partners being more equally distributed. Both ways require different sharing rules for spending, with the consequences of the savings of the two partners being more equal.

Limitations

We are aware that bank data do not exactly reflect the sharing rule of a given household. Kenney (2006) showed that US couples may also use separate money management that is controlled by one partner or a pooling system in which one partner controls the money. This is usually the partner who has more financial knowledge because of role specialisation. As Ashby and Burgoyne (2008, 2009) pointed out, qualitative surveys in the United Kingdom showed that some households without a joint account still consider that they share their income, with spending from the checking account of one individual covering the common interests of family members. However, any adult can easily open any kind of bank account at negligible cost, and so we believe that the use of individual and joint accounts reflects the preferences of household members for sharing or for control of their bank accounts.

Because an individual bank account can only be accessed by its owner, all transactions from individual accounts require the owner's consent. A survey by Woolley (2003) confirmed that owners of individual accounts have primary access and control over their accounts. Joint accounts give equal rights of access and use to both partners, although rules can be set within a family for using joint accounts. Active use of individual accounts or individual accumulation of assets indicates that the partners prefer independence in their everyday spending and saving. Ashby and Burgoyne (2008) also found that individual accounts are considered to be used independently in a partial pooling system, whereas joint accounts are managed together.

Another limitation of the use of bank accounts is the coverage of the accounts. Households do not have to use only one bank for all financial matters. Loans and investment products especially may come from other financial institutions. We compared the presence of different products in our sample with the Household Finance and Consumption Survey (HFCS), which is representative of the Dutch population

in 2013. The share of households with investment products is 13% in the HFCS, which is similar to the 11% share in our sample, while the share of mortgages is smaller in our sample at 25% against 42%, and the share of households with consumer loans is also much lower in our sample at 5%, against 27% in the HFCS (ECB 2016). We conclude that saving products are better captured in the dataset than loan products are.

The strikingly disproportionate distribution that we found still raises the question of whether one household member may have an individual account with another bank and so seems not to possess any assets in the sample. The deposit guarantee system may incentivise people to hold a bank account with another bank. Moreover, gig and part-time workers may direct their earnings from different sources to different bank accounts and in the Netherlands the share of part-time workers is high. Although Treas (1993) showed that it is very common for one partner not to have a bank account, we would need more recent data to be able to assess the validity of this for our sample. There are no publicly available data but we used data from a survey run in the Netherlands in January 2017 that covered 1,116 couples (Van Raaij et al. 2020). This survey revealed that in 14% of couples without a joint account, one partner reports not having an individual account. These statistics are very similar to the statistics from the ING transactional data, and confirm that we have observed a comprehensive financial picture of couples. However, in 48% of the households with pooling in the sample, one partner does not have an individual account while in the survey 31% of households report that one partner does not have an individual account, indicating that we might be missing some data on individual accounts for these households. Therefore we have added robustness analyses in the previous section to address this issue.

Final remarks

The aim of this paper was to investigate how financial assets are distributed within families and whether partial pooling is linked to a more equal distribution of savings between partners. The main focus was on how savings are allocated between joint and individual accounts rather than on the distribution of income and spending. We investigated two hypotheses that are derived from the theory and empirical evidence in the literature: (1) partial pooling of savings in a family leads to more equal distribution of

the family's total financial savings; (2) partial pooling of savings leads to larger differences in the individual financial savings of partners.

There are only a few studies that have focused on savings, mainly on the probability of the existence of joint savings. This paper is the first comprehensive study to distinguish between joint and individual financial assets using bank transaction data. Equal access to family financial assets may lead to partners having more mutual control and more discussions about expenses, and maybe also to more joint financial decision-making, and hopefully as a consequence to fewer financial mistakes being made and problems occurring (Van Raaij et al. 2020). These beneficial consequences will improve the satisfaction and well-being of both partners.

We indeed found substantial differences between the individual financial assets of household members. The individual assets are distributed evenly in almost 50% of the households that do not use full pooling. Only in 8% of the households with partial pooling does one partner hold most of the assets. This implies that having a joint account leads to a more even distribution of assets. However, when we compared the individual assets of the partners, we found that in 54% of the households that pool partially, one household member holds most of the individual assets on their own account. The panel estimations revealed that in the households that keep more assets on joint accounts, the individual savings are distributed more unevenly, as an increase of 10 percentage points in the share of joint savings is associated with an increase of 1.4 percentage points in the gap in the individual savings. The estimations are robust to different model specifications and for different samples. The findings indicate that joint savings in themselves are shared equally by couples, but the sharing is not reflected in how the individual savings are divided.

Financial satisfaction and well-being are drivers of overall satisfaction and wellbeing. Other drivers are good health, meaningful work and job satisfaction, security of work and income, good social relationships with relatives and friends, the quality of schools and governmental institutions, and other factors as well. Financial well-being is probably not the most important driver, though it may be expected that a lack of financial means and poor financial management will have severe adverse effects

on mutual trust and on the overall satisfaction and well-being of the partners. In this sense, low financial well-being may be stronger as a factor causing dissatisfaction than high financial well-being is as a factor causing satisfaction. This hypothesis should be tested in future research.

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Appendix

Table A.1. Ownership of different account types and the balances on these accounts.

	Participation rate	Mean balance	Median balance
Checking account	99.0%	4,385	2,682
Saving account	96.7%	23,939	10,554
Investment account	12.3%	15,963	4,906
Pension account	0.8%	10,215	6,144

Table. A.2. Sample summary statistics

	Mean	St. Dev.	Min	Max	N
Age of women	45.89	11.46	19	70	204 534
Age of men	48.05	11.41	19	70	204 534
Number of children	0.65	0.99	0	8	204 534
Household total income	4 977	2 837	0	87 549	204 534
Household total financial assets	29 522	39 984	0	258 933	204 534
Household joint financial assets	9731	19 549	0	254 947	204 534
Household individual financial assets	19 791	31 760	0	258 913	204 534

Table A.3. Estimation results for the difference in individual shares of financial assets in a family

	(1)		(2)	
	From total financial assets		From individual financial assets	
Pool - share on joint account	-0.613***	(0.011)	0.143***	(0.012)
Age groups of women (base < 30)				
30-39	0.002	(0.006)	0.002	(0.009)
40-49	0.001	(0.008)	0.003	(0.011)
50-59	-0.001	(0.011)	0.001	(0.014)
60-70	-0.001	(0.012)	0.006	(0.015)
Age groups of men (base < 30)				
30-39	0.014	(0.009)	0.010	(0.011)
40-49	0.017	(0.010)	0.014	(0.013)
50-59	0.014	(0.012)	0.014	(0.015)
60-70	0.012	(0.013)	0.010	(0.016)
Number of children (base 0)				
1	0.000	(0.007)	-0.001	(0.009)
2	-0.002	(0.007)	-0.003	(0.009)
3-4	-0.011	(0.013)	-0.013	(0.015)
≥ 5	-0.001	(0.023)	-0.004	(0.025)
Household income (base < €1,000)				
1,000-1,999	0.004	(0.011)	0.017	(0.013)
2,000-2,999	0.002	(0.012)	0.017	(0.014)
3,000-3,999	-0.004	(0.012)	0.008	(0.014)
4,000-4,999	-0.010	(0.013)	0.002	(0.015)
5,000-5,999	-0.012	(0.013)	-0.002	(0.015)
≥ 6,000	-0.017	(0.013)	-0.010	(0.015)
Household financial assets (base < €2,000)				
2,000-4,999	-0.015***	(0.003)	-0.013**	(0.004)
5,000-9,999	-0.008	(0.005)	-0.003	(0.006)
10,000-19,999	-0.005	(0.005)	0.000	(0.007)
20,000-49,999	-0.007	(0.006)	-0.003	(0.007)
50,000-99,999	-0.017*	(0.007)	-0.015	(0.009)
≥ 100,000	-0.041***	(0.009)	-0.039***	(0.011)
adj. R ²	0.324		0.128	
Number of groups	6,389		6,389	
Number of observations	204,534		204,534	

Notes: FE estimations of equation (11). Monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.

* p < .05. ** p < .01. *** p < .001

Table A.4. Estimation results for the difference in individual income, or income which is not pooled, in a family

	(1)		(2)	
	From total income		From individual income	
Pool - share on joint account	0.045***	(0.009)	0.098***	(0.004)
Age groups of women (base < 30)				
30-39	-0.011	(0.008)	-0.010	(0.010)
40-49	-0.007	(0.009)	-0.005	(0.011)
50-59	-0.007	(0.010)	-0.005	(0.014)
60-70	0.007	(0.012)	0.010	(0.015)
Age groups of men (base < 30)				
30-39	0.009	(0.007)	0.015	(0.009)
40-49	0.014	(0.008)	0.022*	(0.011)
50-59	0.018	(0.010)	0.024	(0.012)
60-70	0.020	(0.011)	0.028	(0.015)
Number of children (base 0)				
1	0.003	(0.007)	0.006	(0.009)
2	0.002	(0.007)	0.006	(0.009)
3-4	0.003	(0.010)	0.011	(0.013)
≥ 5	0.033*	(0.016)	0.051*	(0.023)
Household income (base < €1000)				
1,000-1,999	-0.011	(0.015)	-0.006	(0.016)
2,000-2,999	-0.035*	(0.015)	-0.027	(0.016)
3,000-3,999	-0.049**	(0.015)	-0.045**	(0.016)
4,000-4,999	-0.059***	(0.016)	-0.057***	(0.017)
5,000-5,999	-0.067***	(0.016)	-0.068***	(0.017)
≥ 6,000	-0.073***	(0.016)	-0.077***	(0.017)
Household financial assets (base < €2000)				
2,000-4,999	-0.004	(0.003)	-0.003	(0.003)
5,000-9,999	-0.002	(0.003)	0.000	(0.004)
10,000-19,999	-0.003	(0.004)	-0.001	(0.004)
20,000-49,999	0.0002	(0.004)	0.003	(0.005)
50,000-99,999	0.005	(0.005)	0.009	(0.006)
≥ 100,000	0.007	(0.007)	0.013	(0.009)
adj. R ²	0.283		0.209	
Number of groups	5,464		5,464	
Number of observations	160,514		160,514	

Notes: FE estimations of equation (11). Monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.

* p < .05. ** p < .01. *** p < .001

Table A.5. Estimation results for the difference in individual spending in a family

	(1)		(2)	
	From total spending		From individual spending	
Pool - share on joint account	0.042***	(0.009)	0.093***	(0.004)
Age groups of women (base < 30)				
30-39	-0.010	(0.007)	-0.009	(0.009)
40-49	-0.007	(0.009)	-0.004	(0.011)
50-59	-0.001	(0.010)	0.003	(0.013)
60-70	0.005	(0.012)	0.012	(0.015)
Age groups of men (base < 30)				
30-39	0.005	(0.008)	0.011	(0.010)
40-49	0.008	(0.009)	0.015	(0.011)
50-59	0.009	(0.010)	0.014	(0.013)
60-70	0.015	(0.012)	0.022	(0.015)
Number of children (base 0)				
1	0.000	(0.006)	0.003	(0.009)
2	-0.005	(0.007)	-0.003	(0.009)
3-4	-0.006	(0.010)	-0.001	(0.014)
≥ 5	0.012	(0.021)	0.022	(0.026)
Household income (base < €1000)				
1,000-1,999	-0.006	(0.014)	-0.001	(0.015)
2,000-2,999	-0.026	(0.015)	-0.018	(0.015)
3,000-3,999	-0.038*	(0.015)	-0.034*	(0.016)
4,000-4,999	-0.047**	(0.015)	-0.045**	(0.016)
5,000-5,999	-0.053**	(0.015)	-0.053*	(0.016)
≥ 6,000	-0.058***	(0.016)	-0.061***	(0.017)
Household financial assets (base < €2000)				
2,000-4,999	-0.006*	(0.002)	-0.006*	(0.003)
5,000-9,999	-0.006*	(0.003)	-0.007	(0.004)
10,000-19,999	-0.007*	(0.004)	-0.010*	(0.004)
20,000-49,999	-0.008	(0.004)	-0.013**	(0.005)
50,000-99,999	-0.009*	(0.005)	-0.015**	(0.006)
≥ 100,000	-0.003	(0.007)	-0.008	(0.009)
adj. R ²	0.248		0.182	
Number of groups	5,464		5,464	
Number of obs.	160,390		160,390	

Notes: FE estimations of equation (11). Monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.

* $p < .05$. ** $p < .01$. *** $p < .001$

Table A.6. Robustness checks for the estimation results for the difference in the individual share of financial assets in a family.

	Control for total individual balance		Sample wo hh with 100% difference		Difference in net financial assets	
	Pool (binary)	Share on joint account	Pool (binary)	Share on joint account	Pool (binary)	Share on joint account
Share from total balance	-0.108*** (0.019)	-0.611*** (0.011)	-0.034 (0.022)	-0.303*** (0.015)	-0.087*** (0.026)	-0.569*** (0.029)
Adj. R ²	0.133	0.324	0.027	0.031	0.002	0.004
No. of groups	6,389	6,389	3,777	3,777	6,389	6,389
No. of observations	204,534	204,534	120,480	120,480	204,534	204,534
Share from private balance	0.130*** (0.023)	0.144*** (0.012)	0.110*** (0.023)	0.082*** (0.007)	0.158* (0.064)	0.175** (0.060)
Adj. R ²	0.098	0.128	0.011	0.021	0.001	0.001
No. of groups	6,389	6,389	3,777	3,777	6,389	6,389
No. of observations	204,534	204,534	120,480	120,480	204,534	204,534

Notes: FE estimations of equation (11). Sample without households with 100% difference contains all households where both household members own an individual account. Net financial assets are all financial assets minus consumer debt and credit card debt. All explanatory variables and monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.

* p < .05. ** p < .01. *** p < .001

Table A.7. Estimation results for the difference in the individual shares of financial assets in a family by age group.

	(1)	(2)	(3)	(4)	(5)
	-29	30-39	40-49	50-59	60-70
<i>Pool (binary)</i>	0.259*** (0.068)	0.130** (0.040)	0.106** (0.040)	0.131*** (0.034)	0.018 (0.056)
Adj. R ²	0.124	0.118	0.101	0.096	0.072
No. of groups	391	1418	1959	1347	1269
No. of observations	13,197	47,570	64,218	42,358	37,142
<i>Share on the joint account</i>	0.300*** (0.030)	0.195*** (0.024)	0.118*** (0.020)	0.107*** (0.025)	0.090*** (0.027)
Adj. R ²	0.166	0.155	0.123	0.122	0.095
No. of groups	391	1418	1959	1347	1269
No. of observations	13,197	47,570	64,218	42,358	37,142

Notes: FE estimations of equation (11) by age groups. All explanatory variables and monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.
 ** p < .01. *** p < .001

Table A.8. Estimation results for the difference in the individual share of financial assets in a family by product type.

	(1)	(2)	(3)	(4)
	Checking account	Saving account	Investment account	Pension account
<i>Pool (binary)</i>	0.118*** (0.022)	0.111*** (0.03)	-0.013* (0.006)	-0.006 (0.024)
Adj. R ²	0.100	0.044	0.025	-0.017
No. of groups	5,703	5,621	694	63
No. of observations	187,289	171,472	17,952	1,654
<i>Share on the joint account</i>	0.144*** (0.013)	0.221*** (0.016)	0.042 (0.023)	-0.050 (0.042)
Adj. R ²	0.130	0.074	0.026	-0.015
No. of groups	5,703	5,621	694	63
No. of observations	187,289	171,472	17,952	1,654

Notes: FE estimations of equation (11) by product type. All explanatory variables and monthly time dummies are included in the estimations but not reported. Standard error estimates are robust to disturbances that are heteroskedastic and autocorrelated.
 * p < .05. *** p < .001