Household Portfolios in the Netherlands[*]

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Abstract

We describe and analyze the portfolio structure of Dutch households using micro data from the CentER Savings Survey, 1993-1998. The data allows for a distinction between many types of assets, such as traditional saving accounts, tax favored employer provided saving plans, various types of risky assets such as stocks, bonds and options, life insurances, pension insurances, housing wealth, etc. Moreover, we have information on mortgage debt, consumer debt, etc. We analyze the composition of household portfolios and the level of portfolio diversification, and its relation to age, birth cohort, and education level.

We compare the ownership rates and amounts held in our survey data with published statistics derived from National Accounts and administrative data.

Using discrete choice models we relate asset ownership to background variables such as age, household composition, education, etc. Moreover, we include subjectively measured explanatory variables reflecting income expectations, attitudes towards risk and the amount of information the respondent has on properties of and returns on financial assets. We consider static as well as dynamic univariate probit models, as well as a multinomial logit model for joint ownership of fairly safe and risky assets.

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1. Introduction

We describe and analyze the portfolio structure of Dutch households using micro data from the CentER Savings Survey (CSS), 1993-1998. This is a panel data set, containing information on wealth components, demographics, and attitudes towards risk, time preference, etc. for about 2500 households. Around 2000 of these are designed to be a random sample, the remainder is sampled from high-income areas.

The data allows for a distinction between various types of assets, such as traditional saving accounts, tax favored employer provided saving plans, various types of risky assets such as stocks, bonds and mutual funds, life insurances, pension insurances, housing wealth, etc. Moreover, we have information on mortgage debt, consumer debt, etc. We describe the distribution of the structure of household portfolio ownership and the level of diversification. We look at cohort and age patterns of ownership rates, which are of importance for the consequences of demographic trends such as ageing of the population on portfolio structures (see Poterba and Samwick, 1997, for example). We focus on financial assets, and the distinction between clearly safe, fairly safe, and risky financial assets. Although much of our analysis focuses on ownership of the assets, we also pay some attention to the amounts held and the shares of various types of assets in total wealth or total financial wealth.

For external validation of our survey data, we compare our wealth data with those derived from other sources. Since 1998, the Dutch Flow of Funds (national) accounts data contain information on the stock of financial wealth and its composition. Moreover, we compare the data in our panel with statistics on the distribution and composition of household wealth published by Statistics Netherlands (Trimp (1997), which are derived mainly from the Income Panel Survey (IPO). The IPO is administrative data on about 75,000 households collected by Statistics Netherlands, providing information on asset and debt amounts registered for the wealth tax. This micro data set itself is not available to us.

Using both static and dynamic discrete choice models, we relate asset ownership to background variables such as age of the head of household, household composition, education, etc. Moreover, the rich set of subjective data on psychological and economic concepts allows us to investigate the relation between portfolio choice and income expectations, attitudes towards risk or the extent to which the household is informed about financial products. We consider univariate models for ownership of the rather broadly defined categories fairly safe and risky assets, and a recently introduced asset type, specific

for the Netherlands: employer sponsored savings plans. We also use a multinomial logit model to investigate the benefits of diversification, in the sense of holding both fairly safe and risky assets.

The remainder of the paper is organized as follows. Section 2 describes the available aggregate stock of wealth data for the Netherlands, based partly on statistics from the Dutch Flow of Funds (national) accounts data, and partly on administrative IPO data, reported by Statistics Netherlands. In Section 3 we describe the set up of the CSS data set which we will use in the remainder of the paper. We discuss the asset and debt types included in the survey, and also describe some of the institutional detail in the Netherlands, concerning taxation of the various assets. We explain how we have aggregated the asset and debt types in the survey to the categories that are common for all country studies. We focus on this aggregation level in the remainder of the paper. At the end of this section, we compare statistics from our survey data with statistics from the administrative IPO data. In Section 4, we present information on ownership rates, asset shares, diversification of portfolios, and composition of household net worth in the format used for all country studies. Section 5 provides a description of age and cohort patterns of ownership rates for fairly safe and risky financial assets, and for employer sponsored savings plans. It also describes how the share of financial assets in total assets varies with age, cohort, and education level of the head of household. In Sections 6 and 7 we look at some results for binary choice models explaining asset ownership. We look at static models in Section 6. In Section 7, we exploit the panel nature of the data, and consider dynamic models in which lagged ownership dummies are included among the regressors. In Section 8 we consider multinomial logit models to analyze diversification. Section 9 concludes.

2. Aggregate Data on the Stock of Wealth

In the publication 'National Accounts 1998' Statistics Netherlands presents for the first time the Flow-of-Funds statement of the sector 'Households'. This statement basically reports the size and composition of households' financial assets and debts at the beginning of the years 1995 until 1998 (see Table 2.1). Before discussing Table 2.1, some observations should be made. Firstly, the National Accounts do not provide data on the value of real assets (e.g. real estate). Secondly, the sector 'Households' includes 'Non-profit institutions serving

households' (like churches, consumer associations, labor unions etc.), and the self-employed. Thirdly, in the National Accounts, a rather broad classification of asset and debt categories has been adopted. For instance, no distinction has been made between whole life insurances on the one hand and pension and other annuity insurances on the other hand.

Table 2.1 indicates that financial net worth (financial wealth) increased considerably (by 38%) from 1104 billion guilders at the beginning of 1995 to 1520 billion guilders at the beginning of 1998.[1] Disposable household income grew much slower in this period, leading to an increase in the financial wealth to income ratio from 2.37 to 2.88. Capital gains are mainly responsible for the increase in net worth. Only a small part (23%) of the increase in net worth is due to financial transactions (96.2 billion guilders between 1995 and 1998). Most of the financial transactions of the household sector are carried out by pension funds and life insurance companies. This result is due to the extensive system of mandatory occupational pensions in the Netherlands (see e.g. Alessie, Kapteyn and Klijn (1997) for more details about the social security and pension system in the Netherlands). If this mandatory type of savings is not taken into account, the savings figures show that households do not 'actively' save much. In order to stress this point somewhat more, we present in Figure 1 a time series of both the ratio of contractual and free saving over disposable household income for the period 1985-1997. In this figure, household saving is defined as disposable income minus consumption. The disposable income measure (and therefore the (conventional) saving measure) does not include capital gains. The total saving measure can be split up in two parts: contractual saving (saving through life insurance companies and pension funds) and non-contractual or 'free' saving. With the exception of 1989 and especially 1990, the total saving rate was fairly constant over time and equal to about 12%. In the 1990's the contractual saving rate gradually increased from 10% to 12%. As a result, the free saving rate was rather low, with a decreasing trend towards zero.

The increase in financial wealth was accompanied by substantial changes in portfolio composition. Between 1995 and 1998, the amount of money in transaction and saving accounts increased by 22% from 269 billion to 327 billion guilders. This relative increase is smaller than that of financial net worth. As a consequence, the asset share of transaction and saving accounts (in total financial assets) decreased from about 18% to 16%. This is due to the saving accounts growing at a slower rate, while transaction accounts grew at an even faster pace (44%) than financial net worth during this period. Similarly, the 'risk-free' asset

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[1] The dollar-guilder exchange rate is about 2 ($ 1= Dfl 2)

item 'certificates of deposits' grew only modestly. In the period 1995 to 1998, the interest rate on saving accounts and certificates of deposits was rather low. The amount of 'cash' stayed entirely constant.

Between 1995 and 1998, the asset share of the (fairly) risky asset category 'Stocks, bonds and mutual funds' increased considerably from 21.9% to 25.1%, at the expense of the risk free asset categories discussed in the preceding paragraph. Especially, the value of stocks has increased considerably.[2] This reflects the increase in the CBS stock exchange index from 278 to 618 between (the beginning of) 1995 and 1998 (see Table 2.1). The effect of the increasing stock prices on share holdings is reinforced by the fact that in principle capital gains are not taxed in the Netherlands. In the same time period interest rates went down, which partly explains the change in portfolio composition observed above. Notice that, relatively speaking, households do not invest much money in bonds (45 billion guilders in 1995). Moreover, between 1995 and 1998 this amount increased by only 12%, and its share in total financial assets went down from 3% to 2.5%.

In the Netherlands, the asset category 'defined benefit pensions and contribution pensions and other life insurances' is a very important part of the household portfolio: its asset share is greater than 50%. Compared with other European countries, this number is rather high. In Germany, the share of life and pension insurances out of total financial assets is equal to about 22% (see Deutsche Bundesbank (1999)) and in Italy to about 11% (see Guiso and Jappelli (1999)). As explained above, most employees (and ex-employees) are covered by a mandatory occupational pension system of the defined benefit type. This institutional fact mainly explains the high asset share of 'defined benefit pensions and contribution pensions and other life insurances'. Unfortunately, this category is rather broadly defined. It also includes whole life insurances and annuity insurances, which are effected by the households themselves. These last two products are tax-preferred saving vehicles: for instance, the interest component of a capital payment from a whole life insurance policy is under some circumstances not taxed. Given this feature, banks and insurance companies have developed financial products that exploit the tax-preferred nature of insurance products. An example of such a product is the so-called life insurance mortgage. This type of life insurance

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[2] The asset item 'stocks' includes the so-called stocks from a substantial holding. A taxpayer is regarded as having a substantial holding in a corporation if he or she, either alone or with his or her spouse, holds directly or indirectly 5% of the issued capital. The aggregated value of stocks from a substantial holding is rather high: estimates from the Income Panel Survey (IPO) indicate that the aggregated value is equal to 109 billion guilders at the beginning of 1997 (see de Kleijn (1999)). At the same time, only 1.9% of the households owns this type stocks.

is effected in combination with a mortgage. The payout of the life insurance is used to redeem the mortgage. Consequently, the amount of the mortgage debt does not decrease during the term of the mortgage contract. Therefore, the life insurance mortgage takes full advantage of the fact that interest payments on the mortgage are fully tax deductible. Not surprisingly, this type of mortgage is rather popular.

Since the National accounts do not provide any information about the value of real assets (primary residence, real estate etc.), we have to rely on other sources. Statistics Netherlands annually publishes statistics on the households' wealth distribution and its composition, which are mainly based on the Income Panel Survey (IPO, "Inkomens Panelonderzoek"). The IPO is a large sample survey (75,000 households), based on administrative records from the income and wealth tax register, supplemented with some information from the Dutch Socio-Economic Panel (SEP), a representative household survey with (limited) information on the composition of household wealth. The IPO statistics suggest that between (the beginning of) 1995 and 1997, the value of the housing stock grew by 30% from 746 billion guilders to 913 billion guilders (see de Kleijn (1999)). Only the smaller part of this growth is due to an increasing trend in the home ownership rate; the major part is explained by a surge in housing prices (see Table 2.1).

The increased demand for housing was accompanied by a decreasing trend in the mortgage interest rate (see Table 2.1). All mortgage interest payments are fully deductible from income tax. It should also be noted that (for instance, due to the lower mortgage interest rate) the mortgage qualification constraints have been relaxed (i.e. the ratio of the maximum mortgage debt, which a household can take out, and households' earnings has increased over the period).[3] As Table 2.1 shows, the long-term debt of households (which mainly consists of mortgages) grew considerably over the period 1995-1998. In the very recent years, new mortgages are not only effected in order to purchase a new house. In the third quarter of 1999 only 40% of the new mortgages are effected for this purpose. In case of the other mortgages, the increase in the house value is exploited to e.g. buy other durable goods or finance stock market operations (CBS press release PB99-285). As from 2001, the government wants to abolish the tax deductibility of mortgage interest payments, if the mortgage is not used for purchasing a new primary residence or for maintenance (renovation) of the existing dwelling.

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[3] Before 1992, banks generally did not consider spouses' earnings in the determination of the mortgage qualification constraint.

Like long-term debt, the amount of households' short-term debt has increased considerably from 33.3 billion guilders to 46.9 billion guilders, presumably due to income growth and the decreasing trend in the interest rate. Its share of total financial assets remained fairly constant during this period (around 2.2%). There are, of course, no capital gains on consumer debt.

3. Micro Data

We use six waves of the CentER Savings Survey (CSS), drawn from 1993 until 1998. Nyhus (1996) describes the set up of this data set and its general quality. The panel consists of two samples. The first is designed to be representative for the Dutch population (REP). It contains approximately 2000 households in each wave. Refreshment samples are drawn in each year to correct for panel attrition. The second sample was drawn from high-income areas and should represent the upper income decile (HIP). Initially it consisted of about 900 families, and is available in each wave except the final one.

Due to survey non-response, the realized REP samples are not completely representative for the Dutch population. For our analyses, we combine REP and HIP sample and use sample weights to correct for non-random sampling. The sampling weights are based upon income and home ownership. For observations with missing income, income is predicted from background variables such as family size and education level and age of the head of the household. The weights are constructed using information from a much larger data set (WBO, Woning Behoefte Onderzoek or Housing Needs Survey) collected by Statistics Netherlands. The WBO is close to representative for the Dutch population.

The data were collected via on-line terminal sessions, where each family was provided with a PC and modem. The survey questions cover general information on the household and its members, work history and labor market status of household members of 16 years and older, health status, detailed information on many types of income, economic-psychological questions on risk attitudes, time preference, expectations, interest in financial matters, etc. Most important for our purposes is the questionnaire section on assets and debts. For most of the 40 asset and debt categories, respondents first indicate whether they own assets or debts of that type. If they answer this question affirmatively, they are requested to go through a series of questions concerning amounts and the precise nature of the asset or

assets in that category, separately for each item or account within the category. There is virtually no nonresponse in the ownership questions. On the other hand, there is substantial nonresponse in some of the questions on the amounts. For example, about 25 percent of those who own shares do not know or refuse to give the value of their shares. Similar problems exist for the value of life insurances and defined contribution plans (annuity insurances), shares from a substantial holding, and business equity. For financial assets like saving accounts, of which the value is easy to determine, the number of missing amounts is still about 10 percent of the number of owners. For the value of the house or mortgages, the level of item-nonresponse is rather low (below 5%).

To deal with these item-nonresponse problems, we have imputed the amounts of assets held for those of whom we know they own the asset but for whom the amount is unknown. The imputed values are based upon amounts held in adjacent years, and on the use of regression models which relate the observed amounts with household characteristics. We do not impute predicted values, but add randomly drawn error terms to take account of prediction errors. These error terms are drawn from the estimated error term distribution in the regression models, where full account is taken of the covariance structure of the error terms over time. This procedure obviously requires the implicit assumption that - conditional on the regressors used to construct the imputed value - whether or not a respondent reports the amount, is not related to the amount itself. Whether this assumption is valid cannot be tested in our framework. In the econometric models (Sections 6, 7 and 8), we will therefore focus more on ownership rates, for which no such assumption is needed, and not so much on the amounts held or the shares in total wealth or total financial wealth.

The asset and debt categories in the survey are listed in the right hand panel of Table 3.1. *Checking accounts* are necessary for many financial transactions, and are the usual channel for receiving income. They are held by a large majority of households. Interest on these accounts is zero or close to zero. *Deposit books, savings or deposit accounts, savings certificates, and savings arrangements linked to a Postbank account,*[4] are different types of traditional risk free savings, with varying withdrawal conditions (free withdrawal, fixed term, premium in case of withdrawal, etc.). The interest income from these savings, together with any interest received on checking accounts, is taxed to the extent that it exceeds some threshold (Dfl 2,000 for couples, Dfl 1,000 for singles).

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[4] The Postbank is a market leader in terms of consumers' checking accounts; as a peculiarity, saving accounts are directly linked to (the ownership of) a checking account with this bank.

Employer sponsored saving schemes are a fairly new attractive way of saving offered by most employers, introduced in the early nineties. This type of asset does, as far as we know, not exist in other countries. Interest income from these schemes is treated separately from other interest income, and not liable to income tax up to a substantial threshold (Dfl 2,000 for couples, Dfl 1,000 for singles). Up to a certain maximum amount per year, contributions to these schemes are tax deductible, under the condition that the money is not withdrawn for four years (unless there are special circumstances, e.g. a house is bought). This makes these schemes less liquid than ordinary savings accounts. The money in the employer sponsored saving schemes can also be used to purchase (illiquid) single premium annuities, which gives an extra tax relief, or other assets, such as mutual funds. Thus, in terms of tax treatment, these schemes have some similarities to the IRA's in the US, though the latter are still much less liquid. The ownership rate of this asset has risen fast shortly after its introduction, and has remained approximately constant since 1995 (see Table 4.1 below).

Ownership of *bonds* is not very common among private households. Our survey data do not distinguish between long-term and short-term bonds, or between government bonds and bonds of private companies.

The CSS distinguishes between two types of stocks: *stocks from substantial holding*[5] and (*other*) *shares of private companies*. The two are very different for tax purposes, since the former is treated as business capital, while the latter is not. Income from a substantial holding in a corporation is subject to income tax and is taxed at a rate of 25% insofar as this income exceeds the first tax bracket of 37.3%.[6] Dividends from other shares and from *mutual funds and/or mutual fund accounts* are taxable, to the extent that they exceed an exemption threshold (Dfl 2,000 for couples, Dfl 1,000 for singles). Capital gains on these are not taxed. The thresholds on dividends are completely separated from the thresholds on interest on savings, creating a tax incentive for diversification.

While mutual funds are typically portfolios of shares, *growth funds* are portfolios of close to riskfree assets like bonds and deposits. The returns to growth funds (including capital

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[5] See footnote 2 for a definition. If the corporation has issued different classes of shares, a substantial holding also exists if the taxpayer, either alone or with his or her spouse, holds more than 5% of the issued capital of a particular class of shares. If the taxpayer holds a substantial interest in a corporation, jouissance rights and debt-claims issued by that corporation and held directly or indirectly by the taxpayer, either alone or with his or her spouse, are regarded as forming part of the substantial holding.

[6] Interest derived from debt-claims forming part of a substantial holding is taxed at the normal rate of income tax. Dividends and capital gains derived from the alienation of shares or from the redemption of debt-claims are taxed at a proportional rate of 25% in the income tax, insofar as this income exceeds the first tax bracket of 37.3%. In case of a capital loss, 25% of that loss may be offset against the tax that would otherwise be due.

gains) are liable to corporation tax with a flat rate of 35%, and not to income tax. Thus growth funds are an attractive form of close to riskfree saving for households with high income and a high marginal tax rate whose interest income already exceeds the exemption limit.

The premiums of *single-premium annuity insurance policies* (the only common form of *defined contribution pension plans)* are tax deductible under certain restrictions and up to an upper limit (usually Dfl 5,950 for singles or Dfl 11,000 for couples; sometimes more, if mandatory pensions are inadequate), but the remittances are taxed in the same way as other income sources. Thus the latter type is most attractive for those who expect their income (and thus their marginal tax rate) to fall after retirement, for example due to incomplete mandatory pensions. The ownership rate of such pension plans is rather low. The reason is that most workers are covered by a mandatory pension scheme. This is the case for about 80% of all employees (see Alessie, Lusardi and Kapteyn (1995)). For about two thirds of these, the before tax replacement rate exceeds 60 percent. Due to the progressivity of the tax system and the fact that retired people do not pay social security premiums, the after tax replacement ratio is usually much higher than the before tax replacement ratio. The amounts of mandatory pension wealth therefore exceed by far all discretionary financial wealth (see Alessie, Lusardi and Kapteyn (1995)). As pension wealth is a very substantial part of total household wealth, it is unfortunate that our data do not provide reliable information on the size of mandatory pension entitlements of the households in our sample. Non-mandatory defined-benefit pensions, a common type of asset in many other countries, do virtually not exist in the Netherlands.

The other type of life insurance assets, *savings or endowment insurance policies,* is taxed very differently: premiums paid are not tax deductible, but, under some conditions concerning time span and amount, payments are tax free. This type of life insurance is often combined with a mortgage *(whole life insurance with mortgage on real estate, house or second house)*.

The other two financial asset categories are self-explanatory*: money lent to family or friends,* and *savings or investments not mentioned before*.

Owner occupied housing *(own house)* is by far the largest wealth component of Dutch households, in terms of the aggregate amount involved. Other types of real estate ownership (*investment real estate* and *second house*) are much less common. Real estate ownership is taxed in various ways. First, there are separate municipal property taxes paid by users and

owners. The tax rates vary across municipalities but are not very high. More important is that owner occupied housing is taxed through the income tax, by adding an imputed rent to income. Rent income from letting houses to others is simply added to income and taxed via the normal income tax rates. The increase of the value of real estate property is not taxed.

The survey distinguishes two types of financial business equity: *business equity of independent professionals* and *business equity of self-employed*. Profits from businesses or professional activities are liable to income tax. The definition of these profits for tax purposes is similar to that for firms liable to corporation tax.

The other types of physical assets on which the survey contains information are *cars, motor bikes, boats* and *caravans*. The use of cars and motorbikes is taxed. The tax rate depends on the size of the vehicle, and not on income or wealth.

The survey also contains detailed information on various types of financial debts. By far the most important one in terms of the amounts involved is *mortgages on the house*. Less common are *mortgages on pieces of real estate* and *mortgages on the second house*. Interest paid on mortgages is fully tax deductible.

Finally, the survey provides information on various types of financial debts other than mortgages: *private loans, extended lines of credit, outstanding debts on hire-purchase contracts, outstanding debts with mail-order firms, loans from family or friends, study loans, loans not mentioned before*. Since 1997, the deduction of interest on these types of debt is restricted. Insofar interest paid is not connected with a source of income, a maximum amount of Dfl 7,500 is deductible. For married taxpayers, this amount is doubled. Certain exemptions are applicable. It is envisaged to phase out the tax deductibility by 2001. Finally, *negative checking account balances* are included as a separate debt category.

Apart from the income tax and other taxes paid on income or imputed income from the various assets, families whose value of total assets net of debts exceeds some threshold (in 1998: Dfl 193,000 for single tax payers, Dfl 241,000 for married tax payers), pay a flat rate wealth tax of 0.7% on the amount exceeding the threshold. For computing total wealth, owner occupied housing is valued at only 60% of its market value, while financial assets are valued at their actual value.[7]

The left hand panel in Table 3.1 shows how the asset types referred to in the survey questions are aggregated to obtain the classification common for all country studies, which

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[7] All the tax rules that are described are valid for 1998. The government has proposed a far reaching plan for reforms that will very likely be implemented as of 2001.

will also be used in the remainder of this paper. Most categories speak for themselves, given the explanations above. Due to lack of information in the data, we cannot disaggregate the *bonds* category. Instead, we do include a separate category for *employer-sponsored savings plans.* To the common debt categories, we have added *study loans* and *negative checking account balances*, which do not seem to fit in the common categories.

The bottom panel of Table 3.1 presents a classification of (mainly financial) assets at a more aggregate level. Growth funds are included in the fairly safe assets, since they invest in bonds and deposits. (Other) mutual funds invest in shares, and are included in the risky assets category.

In order to get an impression of the quality of the wealth data of the CSS, we have compared the means of the amounts held and the ownership rates of several asset and liability items with external data sources. The first source is the financial accounts statistics, which is presented in Table 2.1. The second source are published statistics from the IPO data set (the IPO data set itself is not available to us).

Obviously, the financial accounts data cannot be used to check whether or not the ownership rates, which are estimated from the CSS, are reasonable. Comparison with the financial accounts data is impeded by several reasons. Firstly, in the CSS no information is collected on those asset and debt holdings of the self-employed (land, machinery, checking, deposit accounts, loans from banks etc.), which are held for business purposes. In the CSS only business equity (business assets minus business debts) is observed. This implies that, for instance, the aggregate balance on saving and deposit accounts estimated from the CSS, excludes the saving and deposit accounts, which are held by the self-employed for business purposes. This remark also applies to the other asset and liability items. For comparison purposes, this can be a serious problem because the self-employed are overrepresented in the top decile of the wealth distribution (see e.g. Table 4.5 in Section 4). Secondly, the wealth of 'Non-profit institutions serving households' is included in the financial accounts and not in the CSS. Thirdly, there are differences in the way asset and liability items are defined. In particular, the financial accounts cannot be used to check the quality of the CSS data on life insurances and consumer debt.

Due to its partly administrative nature, IPO will not suffer so much from the typical measurement problems with survey data. Data from SEP are used to supplement IPO data, to correct for the fact that many low income households are not required to provide information for income or wealth tax purposes, so that their wealth is not observed in IPO data. Although

IPO is based upon administrative data, it is not guaranteed that the published data perfectly reflect national ownership rates or aggregate amounts held. Underreporting to avoid paying taxes might be as serious as measurement errors in surveys. For this reason, Statistics Netherlands has adjusted the IPO information on the value of the primary residence by making use of the SEP. On the other hand, banks and other financial institutions are obliged to provide the tax authorities with details on the clients' saving accounts balances, the mortgage debt (plus the mortgage interest payments), and on interest paid out. This obligation implies that these asset items should be measured rather accurately in the IPO at least for those households, who are in the income and/or wealth tax register. In the IPO not all assets are covered. Life insurances are not, for example. However, IPO contains the same type of information on business equity as the CSS. This facilitates the comparison between the two datasets considerably because the CSS contains enough information to construct a similar breakdown of assets and liabilities as the IPO. This is one of the reasons that we mainly use the IPO data for comparison purposes. The results of the comparison can be summarized as follows:

- In the years 1993-1997 the IPO estimates of average net worth are 12% lower than the CSS estimates. This result can mainly be attributed to the fact that home ownership rates are lower in IPO than in the CSS (about 43% versus about 48%). The CSS home ownership coincides with that of the Housing Needs Survey (WBO).[8] This is not surprising because the information on home ownership and income from the WBO has been used to construct the sample weights of the CSS. It is unclear why the IPO figure is lower. The CSS average value of the house conditional upon ownership is somewhat higher (about 15%) than its IPO equivalent. A comparison with external sources (i.e. data from Netherlands Association of Real Estate Agents, see Table 2.1) suggests that the IPO data on the value of the house are rather reliable.

- In comparison with the IPO, the CSS underestimates the average balance on checking and saving accounts IPO by about 20%. According to IPO, virtually every household has a checking account and/or saving account whereas according to the CSS about 4% of the households do not have such accounts. This partly explains the lower CSS estimate of the average balance.[9]

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[8] Statistics Netherlands uses the WBO to construct the official home ownership statistics.
[9] We have also compared the aggregate (macro-economic) balance on checking, saving and deposit accounts according to the financial accounts (FA) and the IPO. It turns out that the IPO estimate is 22% lower than the

- According to the CSS the ownership rate of 'stocks, bonds and mutual funds' is considerably higher than according to the IPO (IPO: 25.2%, CSS: 12.8%, (1996)). However, the unconditional means are rather similar (IPO estimate about 6% higher) implying that the CSS considerably underestimates the mean conditional upon ownership. We think that the quality of the IPO estimates of the ownership rates of securities can be questioned for several reasons. Firstly, non-reporting to the tax authorities may explain this phenomenon. Secondly, its estimate relies rather heavily on the SEP whose questions on securities are rather broad. Thirdly, a comparison with the financial accounts shows that IPO underestimates aggregate share holdings considerably (by 45% to 50%).[10] In the CSS the estimate of the average amount invested in shares from a substantial holding is considerably lower than its IPO equivalent. According to IPO (and CSS) very few households hold this type of assets, but these households are typically very rich. Therefore, one can conclude that in spite of its oversampling of households in the highest income decile, CSS considerably underestimates the wealth holdings of the very rich.

- The difference between IPO and CSS estimates of the home ownership rates and of the average value of the house induces a difference in mortgage ownership rates and in mortgage debt. Both data sources suggest, that conditional upon home ownership about 80% of the households have a mortgage on their home.

- The IPO and CSS statistics on consumer credit correspond well to each other.

Estimates of wealth are typically reputed to be not really reliable. The evidence presented above underscores this statement. CSS especially underestimates the wealth holdings of the very rich. However, we think that in comparison with other surveys, the accuracy of the CSS estimates is certainly not worse than other wealth surveys with the exception of the American Survey of Consumer Finances (see, e.g., Brandolini and Cannari (1994) for a useful overview).

4. Ownership and Composition of Household Assets and Debts: Survey Data

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FA estimate. However, a correction for the differential treatment of the self-employed and the non-profit institutions would presumably diminish this difference considerably.

[10] It is rather unlikely that the difference between the IPO and Financial accounts estimates can be completely explained by the differential treatment of the self-employed and the non-profit institutions.

In this section, we describe ownership rates and the composition of asset portfolios of Dutch according to our survey data, using the common classification for all country studies in the left hand panel of Table 3.1. All the results are weighted with the given sample weights, to make the results representative for the Dutch population. The weighted ownership rates for assets are typically smaller than the unweighted ownership rates, reflecting the fact that the rich are oversampled.[11]

Table 4.1 presents the ownership rates. *Transaction and saving accounts* are held by more than 95% of the households in the survey. We suspect that much of the remaining 5% non-ownership is due to measurement error. The main reason is that they include *checking accounts,* which are necessary for many financial transactions, and are the usual channel for receiving income. But also, the large majority of households hold at least one type of traditional saving account. Ownership of *bonds* is not very common among private households. The ownership rate never exceeds about 6 percent, with a decreasing trend. The ownership rate of *stocks* has risen during the nineties, from about 11 to more than 15 percent in 1999. *Mutual funds and managed investment accounts* were on average more often held than stocks, with an even higher growth rate during the sample period. *Defined contribution-pensions* are less commonly held than in many other countries. The ownership rate varies around 16%. The other type of life insurance assets, *cash value of life insurances,* has consistently larger ownership rates than the defined contribution plans, varying between 23% and 26%. These life insurances also include whole life insuraces linked to a mortgage. *Employer sponsored saving schemes* are fairly new. The ownership rate of this asset has risen fast shortly after its introduction, and has remained approximately constant since 1995.   The ownership rates of the category *primary residence* show that the home ownership rate in the sample has increased during the nineties. Ownership of *other real estate*, on the other hand, has declined somewhat. *Business equity* is held by about 6 percent, and the variation over the years does not reveal a systematic pattern. The stock of *durables* only covers cars, motor bikes, boats and caravans. Between 72 and 77 percent of all families own at least one of these. About 80 percent hold assets in at least one of the non-financial asset categories we consider.

The majority of home owners also have one or more mortgages on their house or other real estate (*mortgage and real estate debt).* Like home ownership, mortgage ownership

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[11] It should be noted here, however, that in 1998, there was no separate high income panel (see Section 3). Although the weights should in principle correct for this, it may explain some of the unexpected changes in

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increased over time. Between 30 and 33 percent of all households have some form of *consumer credit*, while other types of financial debt are held by about 10 to 13 percent.

There is a clearly decreasing trend in ownership of (subsidized) *student loans*, entirely due to a political decision to provide incentives to reduce the average time spent for studying. The ownership level of *negative balances in checking accounts* should not be read as 15% of the sample population having an overall negative balance. The respondents are asked to report the balance on every separate checking account they own, the figure means that 15% of households have at least one checking account that has a negative balance (possibly in combination with other checking accounts with positive balances).

The percentage of families with some type of financial debt, including mortgage debt, has increased from about 61 to about 65 percent during the sample period.

The bottom panel of Table 4.1 summarizes the ownership information at the higher level of aggregation defined in the bottom panel of Table 3.1. The percentage with *fairly safe financial assets* has risen from about 49 to about 60 percent, which is largely due to the booming of employer sponsored savings plans. Ownership of risky financial assets has also risen substantially, reflecting the developments of the financial markets in the nineties. In 1998, about 28 percent held some type of risky financial assets, while 33 percent held any risky assets, including business equity and investment real estate.

Table 4.2 describes the composition of household financial wealth, the composition of total wealth, and the composition of debt. The table presents average shares, which may not be very informative about average amounts, due to the different weighting and the fact that portfolio composition strongly varies with total (financial) wealth (see also Table 4.3). Missing values are imputed, as explained in Section 3. The first panel presents the average shares of the various financial asset categories in total financial wealth. The share of the clearly safe assets (*transactions and saving accounts)* has fallen substantially during the nineties, but remains by far the most important financial asset category for most private households, with a share of about 60%. The share of bonds is now well below 1%. Stocks and, in particular, mutual funds have become more important, but the average share of total risky financial assets is still less than one fifth of the average share of riskfree assets. Defined contribution plans and whole life insurances have shares of about 5% and 10%, respectively, and these shares do not change much over time. Whole life insurances are often held by home owners in combination with a mortgage, implying that the average share of this category in

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ownership rates or shares from 1997 to 1998.

total (financial and nonfinancial) wealth is comparatively low. The most salient time pattern is that of employer sponsored savings plans: its share has increased to about 8 percent a few years after introduction. This is in line with the ownership rate pattern for this category. The pattern is almost the mirror image of the time path of traditional savings, suggesting that employer sponsored savings plans may have replaced part of traditional savings.

The average share of financial assets in total assets has increased somewhat over time, but remains less than one half. The two most important nonfinancial assets are primary residence and durables (vehicles etc.). The share of primary residence has risen, but not as much as one might expect, given the enormous increase in housing prices in the past decade.

The most important category of financial debts is mortgage debt, with an average share of about 60 percent in total debt. The share has increased, but not by as much as one might expect due to the increase of house prices and the fall in mortgage interest rates over the nineties. The share of consumer credit has remained fairly stable at about 25% of total financial debt. The other average debt type shares are much lower.

In Table 4.3, we present the average amounts held as shares of the average amounts of total financial wealth, total wealth, or total debts. This implies a different weighting than in Table 4.2: the asset or debt type shares of individual households are weighted by total household (financial) wealth or debt. This is the relevant table for comparing with aggregate data on total amounts invested in different asset categories. We therefore refer to the numbers in Table 4.3 as "macro shares" (see Poterba and Samwick (1997) for similar calculations).

The results are substantially different from those in Table 4.2. The share of riskfree financial assets in total financial assets is between 31 and 36 percent instead of between 60 and 70 percent in Table 4.2. The obvious reason is that this type of assets is relatively important for the low wealth households. The time pattern of riskfree financial assets is decreasing in 1993-1997. A similar discrepancy between micro and macro figures is observed for employer sponsored savings plans. The combined macro share of stocks and mutual funds exceeds that of riskfree financial assets. Both mutual funds and stocks exhibit an increasing trend over time. A drawback of Table 4.3 is that some large amounts may heavily influence the number, due to the very skewed distribution of wealth and its components. This is probably the reason why the time patterns in Table 4.2 are not very pronounced in Table 4.3.

Similar differences are found for financial debts. The macro share of mortgage debt in total debt is much larger than the average share of mortgage debt in total debt, since the people with high mortgage debt are typically those with high financial debt. The opposite

holds for consumer credit, the total amount of which is between 5 and 6 percent of total financial debt.

In Table 4.4, we sketch the ownership structure of financial asset portfolios. We consider the three categories *clearly safe (= riskfree)*, *fairly safe*, and *risky* (cf. Table 3.1). This gives eight possible portfolio structures, depending on whether or not any of the three categories are held. Table 4.4 shows that the number of households reporting no financial assets has fallen in the first few years of the survey, and has remained at a value between 4 and 5 percent since then. In 1993, the largest group were people with riskfree financial assets only. The size of this category has fallen substantially, however. In the later years of the survey, the largest group is those with riskfree as well as fairly safe financial assets. The largest increase is found for the final group, the households with a completely diversified financial assets portfolio: almost 22% of all households hold assets in each of the three risk categories in 1998, versus almost 16% in 1993. About 5% hold clearly safe as well as risky financial assets, but no fairly safe financial assets. This percentage has remained stable over time. The remaining categories are quite small, partly reflecting measurement error.

Table 4.5 reports the same ownership rates as Table 4.1 for each quartile of total wealth, and for the top 5% of the wealth distribution. Table 4.6 does the same for the average shares. We only present the numbers for 1997, since this is the most recent wave for which the high income panel was available. The main conclusions are in line with how we explained the differences between Tables 4.2 and 4.3: there are huge differences between portfolio choices of households in the different wealth quartiles. While clearly safe financial assets are held by all quartiles, ownership of fairly safe and, in particular, risky financial assets is quite uncommon for low wealth households. An exception is the ownership of employer sponsored savings plans, which is common among employees in all wealth categories. The table nicely shows the steeper wealth gradient of stocks compared to mutual funds, an observation due to the concentration of substantial shareholding among the very rich. The positive relation between wealth and home ownership is well known and obvious. The same holds for other non-financial assets. Somewhat surprisingly, consumer credit and negative checking account balances are not uncommon among the rich, though the ownership rates are lower than in the lowest wealth quartile.

The portfolio shares in Table 4.6 basically tell the same story. For the first wealth quartile, clearly safe assets together with employer sponsored savings plans have an average share of almost 90 percent in total financial assets. For the top 5 percent of the wealth

distribution, this is only 28 percent. The share of stocks is particularly large for the top 5 percent of the wealth distribution: almost 29 percent in 1997. The average share of housing wealth (or other real estate) is quite large for the two higher wealth quartiles, but is smaller for the top 5 percent. Again, this is likely due to the impact of holders of substantial shares among the richest. The wealth gradient of business equity as share in total assets is steep and positively sloped, while the gradient of durables is strongly negative.

For the lowest wealth quartile, the average share of consumer debt and the average share of negative balances on checking accounts add up to 76% of total debt, on average. For this quartile, total financial debt typically exceeds total (gross) wealth. On the other hand, for the higher wealth quartiles, consumer debt plays a minor role, and mortgage debt dominates the distribution of debts. In the top wealth quartile, some form of consumer debt is held by more than 24%, but the average ratio of consumer debt to the value of total assets is less than 0.5%. Their average amount of consumer debt held is about Dfl 3,260, compared to an average value of financial and nonfinancial assets of Dfl 630,000.

Table 4.7 presents the same ownership rates as Table 4.5, again for 1997 only, but now broken up according to age categories. The asset ownership rates for stocks, mutual funds, but also bonds, are much higher for the older age groups. Life insurances are typically held by people in their thirties and forties. Employer sponsored savings plans are linked to employment, and are therefore not held by people who retired before this asset type was introduced. Home ownership rates are highest for people in their forties and fifties, business equity is mostly held by people in their forties and fifties. Cars and other vehicles are held in all age groups, though the ownership rate is relatively low for the youngest.

The mortgage debt ownership age pattern follows that of home ownership, except for the highest age groups. Many households in this age group apparently own a mortgage free house. Consumer debt is most common for people in their thirties, forties and fifties, and is very low for the oldest age group. Negative checking accounts are particularly common for the youngest age group, which might indicate that for the young, access to other types of financial debt is restricted.

Table 4.8 presents the shares broken up by age groups (cf. Table 4.6). The average share of clearly safe assets in total financial assets is higher than 50% in all age groups, with a u-shaped pattern. In line with the previous table, the shares of stocks, bonds, and mutual funds rise with age, but the average share of bonds remains quite limited also for the oldest age group. The other age patterns for the asset shares are in line with the ownership rate

patterns. The average share of negative checking account balances in financial debt is close to 19% for the youngest age group, which seems quite high for this relatively expensive type of debt.

5. Age, Cohort and Time Patterns of Asset Ownership Rates

In Figures 2a, 3a and 4, we present head of household age and cohort patterns of the ownership rates of some financial asset types, based upon all six waves of the CentER data panel.[12] We use five year-of-birth cohorts, with birth years 1915-1919 for the oldest cohort, until birth years 1970-1974 for the youngest cohort. Cohort labels indicate the middle year-of-birth. The cohorts born before or after the implied span contain very few observations and are not included in the graphs. Figures 2a and 3a refer to ownership rates of fairly safe and risky financial assets, respectively. (The clearly safe ownership rates are all close to one, making the figure not very interesting.) Figure 4 concerns the typical Dutch asset category *employer sponsored savings plans* (which is also included in the fairly safe financial assets category). Each figure presents the raw ownership rates for each cohort in each wave. The six points for each cohort represent the six average age levels at the times of the six interviews, and form a "cohort curve." For each cohort, these six points are interconnected. The jumps between these cohort curves show that, apart from age effects, there are cohort or time effects. The fact that cohort curves are not horizontal shows that there are time and/or age effects; the fact that not all cohort curves are the same shows that there is more than just time effects. As usual, however, it is not possible to disentangle the three types of effects without further assumptions.

Figure 2a shows that ownership rates of fairly safe assets have a hump shaped age pattern. For the cohorts of working age, there is a steep increase between 1994 and 1996, reflecting the booming of employer sponsored savings plans. Thus the jumps between cohort curves seem better interpreted as calendar time effects than as cohort effects.

The pattern for risky financial assets (Figure 3a) is quite different. Ownership of risky assets continuously rises with age. For the younger cohorts, cohort and calendar time effects do not seem important. For the older cohorts, however, there are clear downward jumps between cohort curves, reflecting either cohort effect - older cohorts are less likely to own

these assets, given age and calendar time - or a calendar time effect - holding risky assets has become more popular in the nineties among the older age groups.

The ownership rates of employer sponsored savings plans are presented in Figure 4. The differences between cohort curves stand out even more clearly than in Figure 2a, and reflect the calendar time effects shortly after introducing this asset type. This shows once more that this type of asset has become much more popular during the period under consideration, due to its attractive construction for employers and employees from a tax and social premiums point of view.

Figures 2b and 3b contain the age patterns broken up by education level. Four education levels are distinguished. Calendar time and cohort effects are ignored; the observations are simply pooled across all waves (implying that each household is included as between one and six observations). The curves are smoothed as functions of age, using a nonparametric kernel regression technique (see Blundell and Duncan (1998), for example).[13] The smoothing removes some of the noise in the raw ownership rates, particularly for the smaller cells, i.e. the youngest and oldest age groups with most education. The age pattern of ownership of fairly safe assets does not change systematically with education. The small ownership rate for the highly educated young could be due to the fact that they have not or have just recently entered the labor market. The pattern for risky financial assets shows that ownership increases quite sharply with age for the highest education level. While for young ages, ownership of risky assets is almost equally likely for all education levels, it is much more likely for a sixty years old head of household with high education than for a sixty years old head with one of the lower education levels. Ownership of *Employer sponsored saving schemes* does not reveal any systematic relationship with education level, and for this reason we do not present the age patterns broken up by education level for this asset.

Figure 5 shows the cohort curves of the average share of financial assets in total assets. While almost every household in every age and cohort group owns some financial assets, there is systematic variation in the share of financial assets. The pattern is u-shaped. There seem to be no systematic cohort or time effects; it seems that the pattern can largely be interpreted as an age pattern with some noise. The u-shape is the mirror image of the commonly found hump shaped pattern of home ownership or the share of housing wealth in

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[12] All graphs are weighted using the sample weights discussed in Section 3.
[13] We used the quartic kernel. The kernel regressions use an adaptive bandwidth with weighting parameter set to 0.5; see, for example, Blundell and Duncan (1998) for the formulae.

total wealth. Home ownership is most likely for people in their forties and fifties, implying that the non-financial wealth share of these people will typically be large.

6. Probit Models for Asset Ownership

In Table 6.1, we present some univariate probit results for the ownership of fairly safe financial assets, risky financial assets, and employer sponsored savings plans. All results refer to the pooled cross-sections of 1994-1998.[14] Summary statistics for the explanatory variables, and a documentation of the wording of the psychological questions can be found in the Appendix. Instead of parameter estimates, we present estimated marginal effects, i.e. the answer to the question: how much will the ownership probability change if the explanatory variable changes by one unit, *ceteris paribus*.[15] These marginal effects are computed at the mean ownership probability. Moreover, in the bottom panel of the table, we present results of tests for joint significance of groups of (related) explanatory variables in each of the probit regressions.

Noncapital income and total net worth are included by means of linear spline functions. These groups of variables are jointly strongly significant in all three probits. Still, the income pattern of risky financial assets ownership is not very clear, with significantly negative and positive slopes interchanging. Ownership of fairly safe assets and employer sponsored savings plans tends to increase with noncapital income. For the savings plans this could be expected, since this form of saving is more attractive for those with higher incomes, due to their tax-favored nature. For risky and fairly safe financial assets, the ownership rate tends to increase with total net worth, and this is stronger for the risky assets than for the fairly safe ones. Gollier (1999) has summarized the predictions of expected (intertemporal) utility models of portfolio choice. Among other things, he shows that under the assumption that the utility function exhibits decreasing absolute risk aversion, wealthier people own more risky assets. Our results are in line with these findings.[16]

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[14] The 1993 wave is not used to make the results comparable to the results in the next section.

[15] To be precise, for continuous variables (like age or income), the derivative of the estimated probability is evaluated; for dummy variables (like education), the change from 0 to 1 is considered and the corresponding change in probability is reported.

[16] We have also carried out a (two-limit) tobit regression of the share of risky assets in total financial assets on the same set of explanatory variables as the static probit models. We also find a positive relation between the share of risky assets and total net worth (the results are not reported here because the effects of the other explanatory variables are also similar to the ownership equation). This result is line with the prediction of

Labor market status variables for the head of household are also significant. The retired and self-employed are more likely to have risky assets than the employed. On the other hand, any state other than paid employment makes it less likely that the household owns fairly safe financial assets, or - as expected - employer sponsored savings plans.

Household composition significantly affects ownership of risky assets, but not of fairly safe assets. Larger families less often own risky financial assets. The positive effects of adults and older children on the employer sponsored savings plans probably reflect the fact that many of these other household members have this asset through their own job.

The next sets of explanatory variables are based upon subjectively measured variables drawn from the psychological section of the survey. This provides a source of economic psychology questions, which is richer than in the typical household survey.[17] The dummy variables for expected income changes are jointly significant at the 5 percent level for risky as well as fairly safe financial assets. The patterns are nonmonotonic, however, and therefore hard to interpret.

According to Gollier (1999) expected utility models of portfolio choice predict that (under plausible assumptions) households with riskier human capital invest less in risky assets (see also Kimball (1993) for the impact of background risk on portfolio choice). We do not find evidence in favor of this theoretical result: the degree of uncertainty about the expected income change is not significant at the 5 percent level.[18]

The next set of variables are dummies for the answer on a seven points scale to the question how interested the head of household is in financial matters. There is a strong positive relationship between interest in financial matters and ownership of risky assets. The same monotonic relation exists with the other two asset types, though the effects are smaller in size.

The next variables reflect whether the head of household agrees with the statement that it is more important to have safe returns to financial investment than to take some risk to create potential excess return. This can be seen as a proxy of risk aversion. As expected, the highly risk averse are the least likely to own risky financial assets. The risk aversion variables are insignificant in the other two ownership equations.

Gollier (1999) that under the assumption of decreasing relative risk aversion, wealthier people invest a larger share of their wealth in risky assets.

[17] Das and Donkers (1999) and Donkers and van Soest (1999) use some of these variables for the earlier waves of the panel.

[18] Likewise, Hochguertel (1997) found only weak support for the impact of background risk on portfolio choice, using the first three waves of CentER Savings Survey.

In contrast to what we might expect from Figure 3a, ownership of risky assets is not very sensitive to age if we control for all the other variables. It should be realized that age is included as a linear spline and that in the probit regression we control for cohort and time effects (see below). Only for the oldest age group, we find an increasing age pattern, which was also in Figure 3a. King and Leape (1987) have found a similar result. They stress the role of financial knowledge in making portfolio decisions, in particular when information intensive assets (such as stocks and other risky securities) are involved. In their empirical analysis, they hence attribute the age effect to the accumulation of information: "Information about investment opportunities is necessary for the construction of the optimal portfolio and arrives over time. Hence age is an important determinant of portfolio composition." Equating financial interest with financial knowledge, we find strong support for the King and Leape hypothesis, using a direct measure; the remaining positive (negative) age effect for old age groups' holding of risky (fairly safe) assets remains puzzling in the light of theory (Gollier (1999)).

We do find that risky assets ownership is significantly more likely for heads of household with university education than for others. For fairly safe assets and employer sponsored savings plans, the age and education patterns are in line with those in Figures 2a and 4. Education variables are jointly insignificant at the 5 percent level for both of these.

We have included time and cohort effects. To identify the model, the time effects are imposed to add up to zero (see, for instance, Deaton and Paxson (1994)). The time effects clearly reveal the calendar time effect on employer sponsored savings plans, both for the asset category itself, and for the category of fairly safe assets, which includes these savings plans, among other fairly safe assets. The cohort effects are insignificant for risky assets ownership, but jointly significant for the other two types of assets.

7. Dynamic Models for Asset Ownership

Due to the panel nature of our data, we can explain asset ownership from lagged ownership. Table 7.1 presents the dynamic versions of the probit models in the previous section. The only difference is that a lagged dependent variable for ownership of the same asset type in the previous year is included. Individual effects are not incorporated, and error terms are assumed to be independent over time, so that any correlation of asset ownership not

explained by the exogenous regressors, will be picked up by the lagged ownership dummy. This dummy is very strong, with a huge marginal effect, implying that asset ownership is almost completely explained by lagged ownership. This is the case for all three types of assets we consider.

Including the lagged ownership dummies reduces the significance levels of many other groups of variables. For the fairly safe assets, only the education variables remain jointly significant at the 5 percent level. The signs of the parameters, however, do not point at a monotonic effect of education. For employer sponsored savings plans, labour market status and cohort dummies remain significant. Heads of household in paid employment are significantly more likely to buy this type of asset than all other categories. The younger cohorts are more likely to buy this asset (or less likely to sell it) than the older cohorts.

Some more groups of variables remain significant in the dynamic equation for ownership of risky assets. The age pattern is very different from that according to the static equation: conditional on lagged ownership, the age pattern is hump shaped, with decreasing probability of buying (or increasing probability of selling) risky assets after retirement age. The noncapital income pattern is similar to the pattern in the static model, and the changing signs do not allow for a clear interpretation. Total net worth and education variables are not significant. Of the subjective variables, interest in financial matters and risk aversion remains significant at the 5 percent level. The signs of the effects are largely in accordance with what we found in the static model: households are more (less) likely to buy (sell) risky assets, the more they are interested in financial matters, and the less they agree with the statement that guaranteed returns are more important than a positive probability of excess returns.

8. Diversification

In this section, we present the estimates of a static multinomial logit model to explain the structure of financial asset portfolios as described in Table 4.4. Since Table 4.4 has shown that very few households do not own clearly safe assets, we focus on the other two types of financial assets, and distinguish four choices only: C: clearly safe assets, no risky assets, and no fairly safe assets (the reference state); CF: clearly safe assets and fairly safe assets, but no risky assets; CR: clearly safe assets and risky assets, but no fairly safe assets; CFR: all three types of financial assets. The few observations without clearly safe financial assets are

removed from the sample. The explanatory variables are the same as in Section 6 (see Appendix for details).

The signs of the parameter estimates can be interpreted in terms of the odds ratio comparing the probability of the state to which the parameter vector corresponds, and the probability of the reference state, i.e. the probability of holding neither fairly safe, nor risky financial assets. For example, a positive coefficient in the fairly safe (CF) vector, implies that the corresponding variable is positively correlated to the probability of holding fairly safe assets but no risky assets, compared to the probability of holding neither of the two. (All these probabilities are conditional on owning clearly safe assets.) The difference with the results for the univariate probit model explaining ownership of fairly safe assets in Section 6 (results in the middle column in Table 6.1), is that the latter does not condition on not owning risky assets. In the current model, the impact of an explanatory variable on ownership of clearly safe assets is different for owners and nonowners of risky assets: for owners, it is determined by the difference between the coefficients corresponding to the alternatives CFR and CR (i.e., the odds ratio of the probabilities of the states CFR and CR). Thus this model allows for interactions between ownership of fairly safe financial assets and ownership of risky financial assets.

Another way to look at this is by using the random utility interpretation of the multinomial logit model. Denote the (indirect) utility of the four states by UC(=0, by normalization), UCF, UCR and UCFR, respectively. The systematic parts of these utility values (ignoring the error terms) are given by 0, x'b(CF), x'b(CR) and x'b(CFR). If there are no interactions, then we would expect that UCFR=UCF+UCR, so b(CFR)=b(CF)+b(CR). Ignoring the error terms in the model, this would mean that choosing both fairly safe and risky financial assets is optimal if and only if holding fairly safe assets but no risky assets is better than holding neither of these two, and holding risky assets without fairly safe assets is also better than holding neither of the two. Thus a test for the restriction b(CFR)=b(CF)+b(CR) can be interpreted as a test for the null hypothesis of no interactions between ownership of the two assets. We performed both a Wald and a Likelihood Ratio test on these restrictions, and the null of no interactions was clearly rejected, implying that interactions do play a role, and the model presented here adds something to the univariate models in Section 6.[19]

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[19] It should be admitted, however, that the multinomial logit model does not seem the most appropriate model to use in terms of the error structure. For example, it imposes the independence of irrelevant alternatives

The results are presented in Table 8.1. Most of the results are in line with those in Table 6.1. We focus on some cases where the interaction effects become apparent, with the sum of the coefficients in the first two columns very different from the coefficient in the final column. The first such case is the constant. With all other coefficients satisfying the restriction, this would mean a constant extra utility of diversification compared to holding only one of the two categories. Differences between other coefficients, however, can invalidate this conclusion. For those with low education, for example, the positive difference in the constant is partly counteracted by a negative interaction term: the coefficient in b(CFR) is negative and significant, and larger in absolute value than the sum of the two coefficients. This implies that the positive interaction effect is smaller for those with low education than for those with highest education level.

A similar finding is obtained for the variables referring to numbers of children living at home. For each of these variables, the coefficient in b(CFR) is relatively small. This implies that the presence of children would reduce the benefits of diversification. The reverse is found for the income expectation dummies, suggesting that benefits of diversification are smallest for those who expect a large income fall. Similarly, we find that the benefits of diversification are larger for those who are not at all risk averse than for those who are very risk averse.

9. Conclusions

We have analyzed household portfolios in the Netherlands. We found many results. Here we summarize only some of them. Both the macro-economic and micro-economic evidence point out that during the nineties investing in risky assets (stocks and mutual funds) has become more popular. *Prima facie* evidence and static probit regressions point out that especially elderly households and the rich have a relative high probability of owning risky assets. The fact that especially elderly households own risky assets, may seem surprising at first sight. However, this last result no longer holds if lagged ownership of risky assets is controlled for. The age profile becomes hump-shaped. This result suggests that the panel feature of the data should be exploited more in order take into account for the impact of unobserved heterogeneity. This is a topic of future research.

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assumption. Relaxing this and taking account of individual effects and the panel nature of the data, is left for future research.

The data clearly show that tax incentives matter: rather quickly after their introduction, many employees opened tax preferred employer-sponsored saving accounts. Finally, we like to mention that some of our results are the same as for the other countries analysed in this volume, some are different. Further research is necessary to explain the differences from institutional or cultural differences.

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Figure 1: Total, contractual and free saving rate in the Netherlands
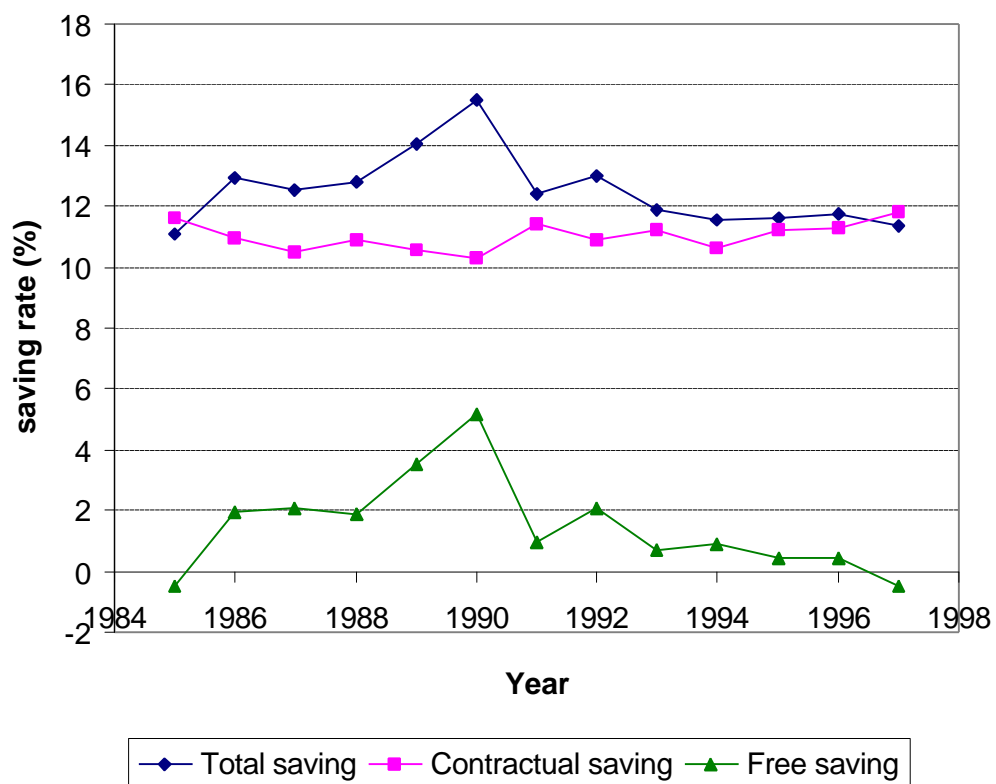
Figure 2a: Ownership of Fairly Safe Financial Assets, by Birth Cohort

Ownership Rates by Cohort
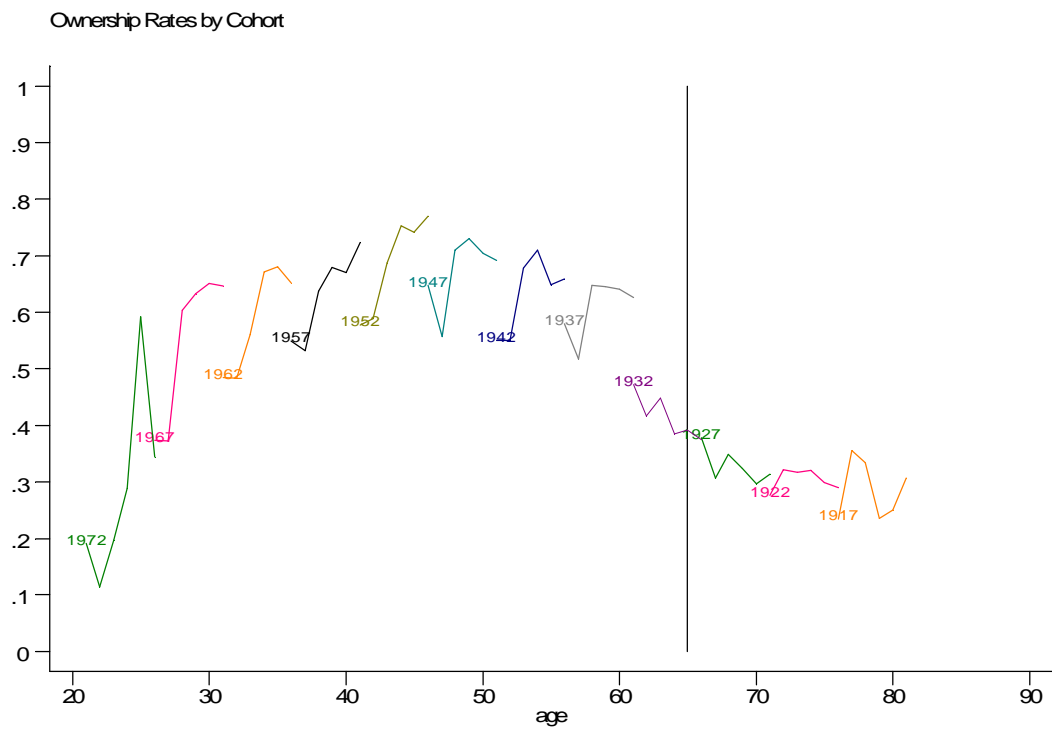
Figure 2b: Ownership of Fairly Safe Financial Assets, by Education

Figure 3a: Ownership of Risky Financial Assets, by Birth Cohort
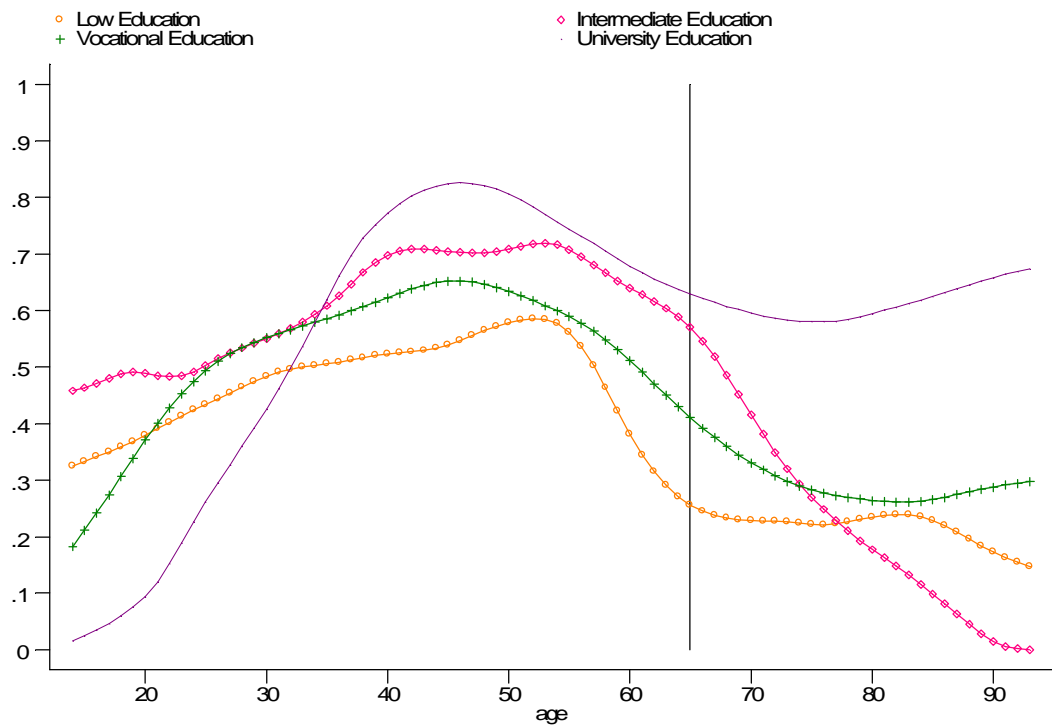
Ownership Rates by Cohort
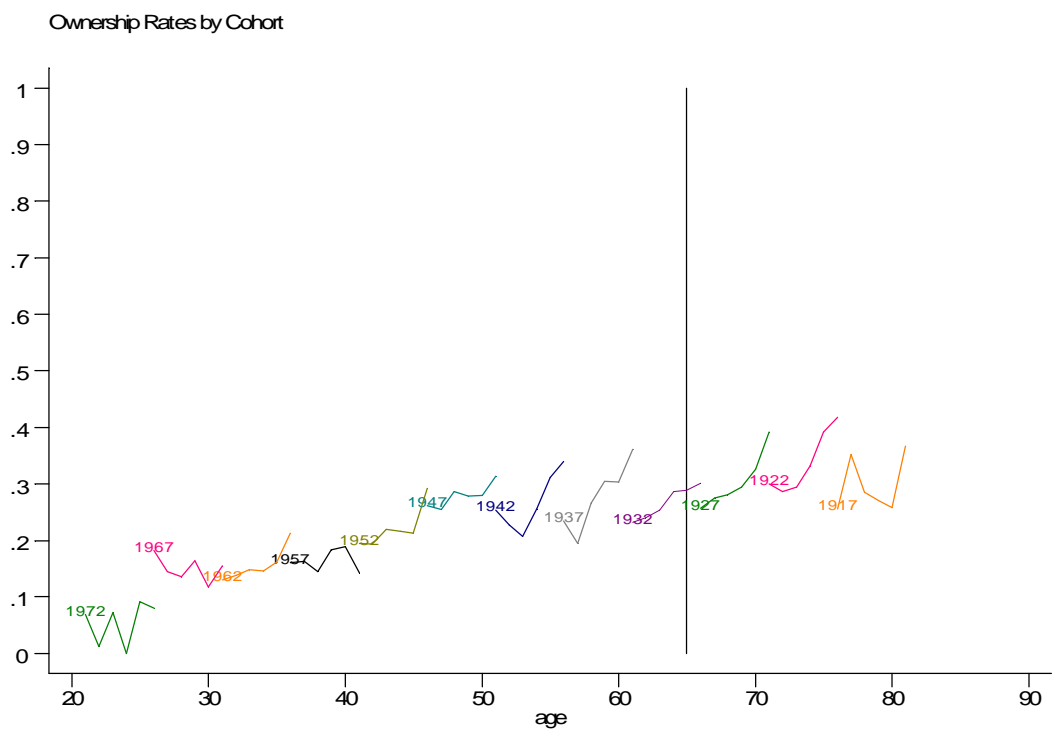
Figure 3b: Ownership of Risky Financial Assets, by Education
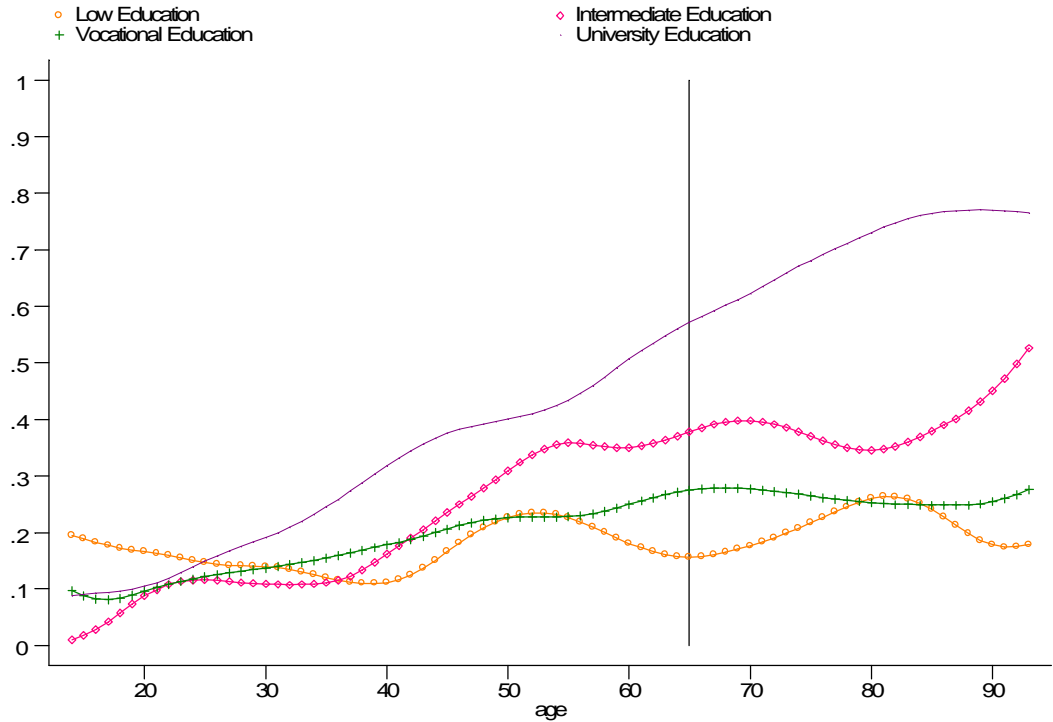
Figure 4: Ownership of Employer Sponsored Saving Plans, by Birth Cohort

Ownership Rates by Cohort
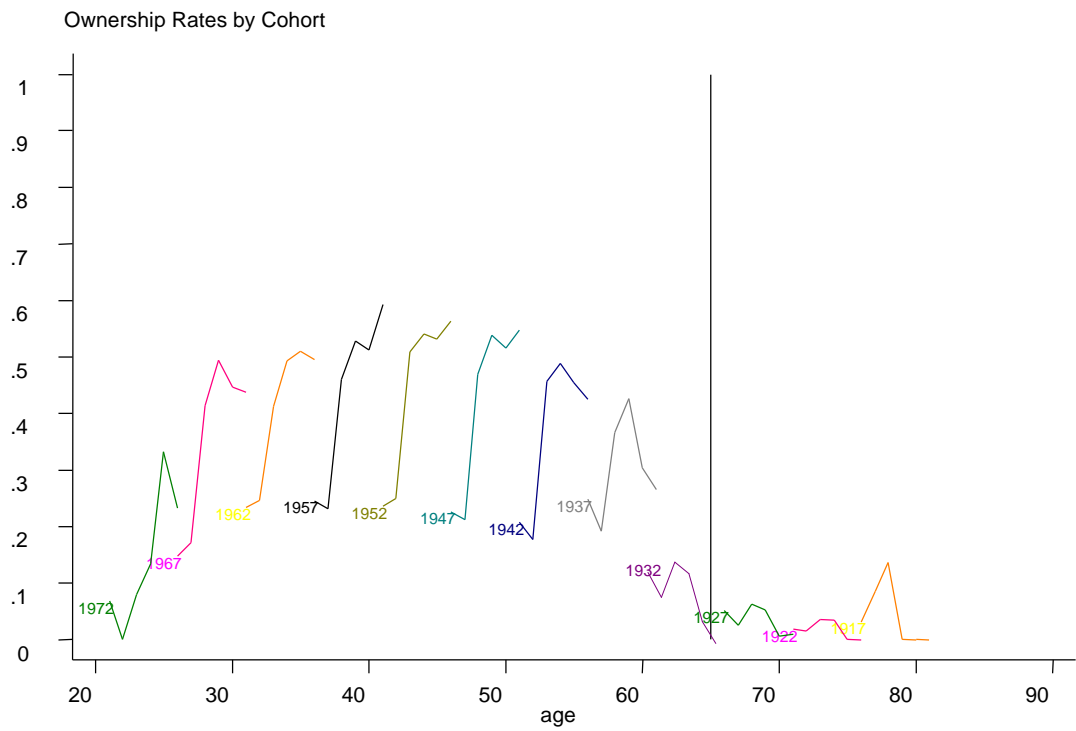
Figure 5: Share of Financial Assets in Total Assets, by Birth Cohort

Asset Share by Cohort
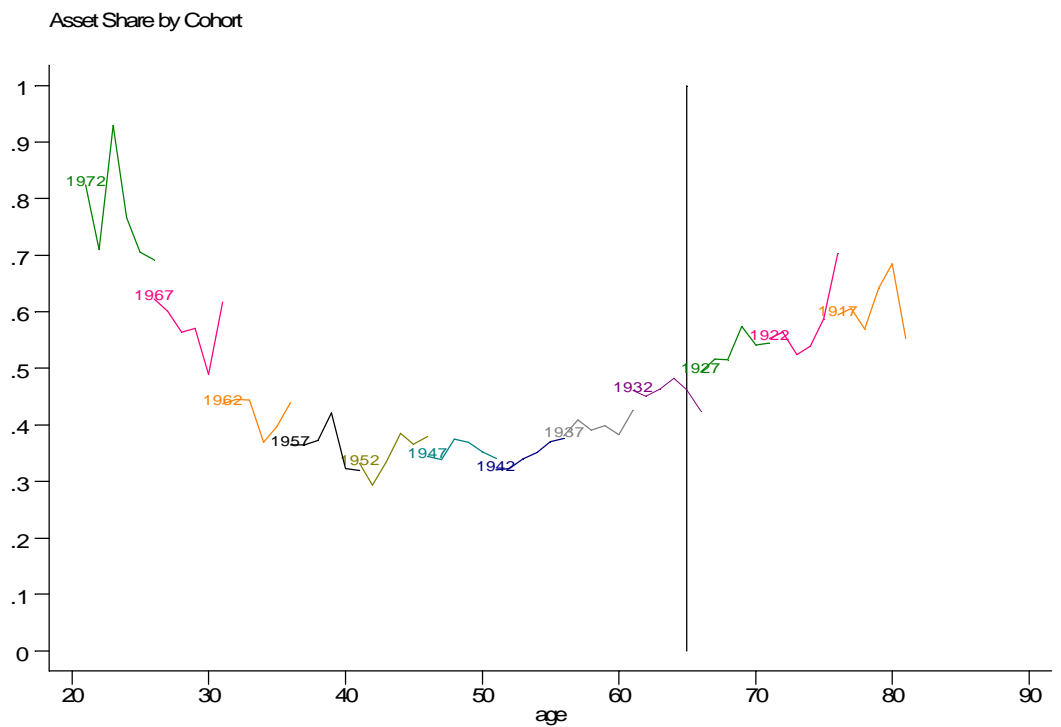
Table 2.1: Financial balances of the sector 'households' and 'non-profit institutions serving households' (in billion Dutch guilders)

	1995				1996				1997				1998	
	Balance primo year	Asset share	Financial trans-actions	capital gains (reva-lua-tion)	Balance primo year	Asset share	Financial trans-actions	capital gains (reva-lua-tion)	Balance primo year	Asset share	Financial trans-actions	capital gains (reva-lua-tion)	Balance primo year	Asset share
ASSETS														
Cash	36.8	2.5	- 0.1	0.0	36.7	2.3	- 0.1	0.0	36.6	2.0	0.1	0.0	36.7	1.8
Transaction and saving accounts	269.2	18.1	20.5	- 0.0	289.7	17.8	23.9	- 0.1	313.5	17.3	14.3	0.0	327.8	15.9
Transaction accounts	53.5	3.6	6.8	- 0.0	60.3	3.7	10.1	- 0.1	70.4	3.9	5.4	0.0	75.8	3.7
Saving accounts	215.7	14.5	13.7	0.0	229.4	14.1	13.7	0.0	243.1	13.4	8.9	0.0	252.0	12.2
Certificates of deposits	43.8	2.9	- 2.1	0.1	41.8	2.6	- 1.0	- 0.0	40.8	2.3	5.4	0.0	46.1	2.2
Stocks, bonds, and mutual funds	325.1	21.9	3.4	36.5	365.1	22.5	10.6	40.7	416.3	23.0	20.0	80.6	517.0	25.1
Bonds	45.1	3.0	3.5	2.7	51.3	3.2	4.2	0.1	55.7	3.1	- 3.8	- 1.2	50.7	2.5
Stocks, mutual funds	280.0	18.8	- 0.1	33.8	313.7	19.3	6.4	40.5	360.7	19.9	23.8	81.8	466.3	22.6
Def. benefit and contribution pensions and other life insurances	772.0	52.0	50.4	27.5	849.9	52.4	51.3	58.4	959.5	53.1	53.5	70.0	1083.1	52.6
Other financial assets	5.1	0.3	- 0.2	- 0.2	4.7	0.3	0.0	- 0.3	4.5	0.2	0.1	- 0.0	4.6	0.2
Trade credits and residual	33.8	2.3	2.8	- 1.2	35.4	2.2	- 0.8	2.5	37.1	2.1	5.4	2.9	45.4	2.2
Total financial assets	1485.8	100.0	74.7	62.6	1623.1	100.0	84.0	101.2	1808.4	100.0	98.7	153.6	2060.7	100.0
LIABILITIES														
Short term debt	33.3	2.2	2.7	0.1	36.1	2.2	3.7	- 0.0	39.7	2.2	6.8	0.3	46.9	2.3
Long term debt	347.9	23.4	33.1	1.1	382.2	23.5	50.0	- 0.8	431.3	23.9	65.1	- 2.9	493.5	23.9
Total debts	381.2	25.7	35.8	1.3	418.3	25.8	53.7	- 0.8	471.1	26.0	71.9	- 2.6	540.4	26.2
Financial wealth	1104.5	74.3	39.0	61.4	1204.9	74.2	30.4	102.1	1337.3	74.0	26.8	156.2	1520.3	73.8
Financial wealth to income ratio	2.37				2.51				2.69				2.88	
CBS stock price index (1983=100)	278				321				437				618	
Mortgage interest rate	7.26				7.12				6.25				5.82	
House prices	228				248				272				293	

Source: Dutch National Accounts 1998 (Table R.4.B), CBS stock price index, mortgage interest rate: Statline (Eelectronic databank of Statistics Netherlands), house prices: Netherlands Association of Real Estate Agents (*Nederlandse Vereniging van Makelaars* (NVM)).

Note: the asset item 'Stocks, mutual funds and managed investment accounts' includes 'stocks from substantial holdings'

Table 3.1: Overview: Definition of Aggregates

Asset and Liability Aggregates	Asset and Liability Items in CentERpanel
Transaction and saving accounts and Certificates of deposit	Checking accounts; savings arrangements linked to a Postbank account; deposit books; savings or deposit accounts; savings certificates
Bonds	Bonds and/or mortgage bonds (all types)
Stocks	Stocks and shares; including shares of substantial holding
Mutual funds and managed investment accounts	Mutual funds and/or mutual fund accounts; growth funds
Defined-contribution plans	Single-premium annuity insurance policies
Cash value of life insurance	Savings or endowment insurance policies; including whole life insurances linked to a life insurance mortgage (on all types of real estate)
Employer-sponsored savings plans	Employer-sponsored savings plans
Other financial assets	Money lent out to family or friends; savings or investments not mentioned before
Total financial assets (sum of the above)	
Primary residence	Primary residence
Other real estate	Second house; other real estate not used for own accommodation
Real estate (sum of the above)	
Business equity	Business equity self-employed; business equity of people working free lance/practicing a free profession
Stock of durable goods	Cars; motorcycles; caravans; boats
Total non-financial assets (sum of the above)	
Total assets (total financial and total non-financial assets)	
Mortgage and real estate debt	Mortgages (on any type of real estate)
Study loans	Study loans
Negative checking account balances	Negative checking account balances
Consumer credit	Private loans; extended lines of credit; outstanding debts on hire-purchase contracts, debts based on payment by installment and/or equity-based loans; outstanding debts with mail-order firms, shops or other sorts of retail business
Other debt	Loans from family or friends; loans not mentioned before
Total debt (sum of the above)	
Total Net Worth (total assets less total debts)	

Asset Categories According to Riskiness	Included Aggregates (and Items)
Clearly safe financial assets	Transaction and saving accounts and certificates of deposit
Fairly safe financial assets	Defined contribution plans; cash value of life insurance; employer-sponsored savings plans; growth funds; other financial assets
Risky financial assets	Stocks; bonds; mutual funds and/or mutual fund accounts
Total financial assets	
Risky total assets	Risky financial assets; business assets; other real estate

Table 4.1: Asset and debt ownership rates: survey data

	Year					
	1993	1994	1995	1996	1997	1998
ASSETS						
Total financial assets	93.3	94.0	95.5	96.0	95.7	95.4
Checking and savings accounts	92.2	92.7	93.6	94.7	93.3	93.2
Bonds	6.0	4.8	4.2	4.6	3.5	3.5
Stocks	11.4	10.0	11.5	13.5	14.4	15.4
Mutual funds	14.0	15.1	15.3	17.8	19.0	21.6
Defined contribution plans	14.2	12.9	15.8	17.7	17.5	17.5
Cash value of life insurance	24.5	24.1	24.8	25.9	25.2	23.0
Employer-sponsored saving plans	18.1	17.2	36.1	39.9	36.6	35.8
Other financial assets	13.3	12.4	13.1	13.0	15.0	14.0
Total non financial assets	78.4	79.4	80.0	81.4	83.2	79.2
Real estate	48.8	48.6	49.3	50.0	51.0	51.6
House	47.6	47.6	48.4	49.2	50.0	50.8
Other real estate	6.2	5.8	5.1	5.6	5.6	4.5
Business equity	4.8	5.9	6.3	6.8	7.1	5.1
Stock of durable goods	71.4	72.8	73.2	75.6	76.7	72.7
Total assets	95.9	96.4	97.2	97.4	97.4	97.1
LIABILITIES						
Total debt	64.5	63.9	63.9	65.3	65.7	65.7
Mortgage and real estate debt	39.7	38.9	40.9	41.8	43.0	42.6
Consumer credit	33.2	31.3	30.2	30.6	32.4	32.0
Other debt	7.4	8.1	7.3	7.0	7.0	5.6
Study loans	6.2	5.3	5.0	4.4	3.8	5.7
Negative balance checking account	14.9	13.7	14.2	15.0	16.3	16.9
Net worth	97.7	98.1	98.8	98.6	98.6	98.9
Total assets	95.9	96.4	97.2	97.4	97.4	97.1
Clearly safe assets	92.2	92.7	93.6	94.7	93.3	93.2
Fairly safe assets	48.9	46.8	57.8	60.4	59.4	58.2
Safe assets	93.2	93.8	95.3	95.9	95.7	95.1
Risky financial assets	21.2	20.6	21.9	23.7	24.8	27.7
Risky total assets	27.7	27.4	28.4	31.1	31.5	32.8

Source: CentER-panel

Table 4.2: Asset and debt shares: survey data (micro shares)

	Year					
	1993	1994	1995	1996	1997	1998
ASSETS						
	As a % of total financial assets					
Total financial assets	100.0	100.0	100.0	100.0	100.0	100.0
Checking and savings accounts	68.7	69.8	64.2	61.5	60.3	60.3
Bonds	1.1	0.8	0.7	0.8	0.6	0.6
Stocks	3.6	3.1	3.6	4.0	4.9	5.4
Mutual funds	4.0	5.1	4.8	5.5	5.9	7.2
Defined contribution plans	4.9	4.8	5.8	5.7	5.1	4.7
Cash value of life insurance	10.8	10.0	11.0	11.5	10.3	9.5
Employer-sponsored saving plans	3.0	3.0	5.8	7.1	8.2	7.9
Other financial assets	3.9	3.3	4.1	3.9	4.7	4.3
	As a % of total assets					
Total financial assets	42.5	41.9	42.2	43.5	41.8	44.3
Total non financial assets	57.5	58.1	57.8	56.5	58.2	55.7
Real estate	37.8	37.5	37.9	38.4	39.1	39.8
House	35.6	35.6	36.2	36.6	37.2	38.2
Other real estate	2.2	1.9	1.7	1.8	1.9	1.6
Business equity	1.7	2.0	2.1	1.9	2.6	1.9
Stock of durable goods	17.9	18.5	17.8	16.2	16.5	14.0
Total assets	100.0	100.0	100.0	100.0	100.0	100.0
LIABILITIES						
	As a % of total debt					
Total debt	100.0	100.0	100.0	100.0	100.0	100.0
Mortgage and real estate debt	57.4	57.4	59.7	60.3	61.3	60.5
Consumer credit	25.2	25.6	24.4	23.5	24.6	25.1
Other debt	4.6	6.0	5.2	5.0	4.2	3.5
Study loans	5.2	4.7	5.0	4.4	3.4	5.9
Negative balance checking account	7.6	6.3	5.7	6.8	6.4	5.0
	As a % of total financial assets					
Clearly safe assets	68.7	69.8	64.2	61.5	60.3	60.3
Fairly safe assets	24.0	22.5	28.0	29.8	30.2	28.3
Safe assets	92.6	92.3	92.2	91.3	90.5	88.7
Risky financial assets	7.4	7.7	7.8	8.7	9.5	11.3
	As a % of total assets					
Clearly safe assets	31.1	30.9	29.2	29.3	27.1	28.8
Fairly safe assets	8.0	7.4	9.5	10.2	10.4	10.3
Safe assets	39.1	38.3	38.7	39.5	37.5	39.1
Risky financial assets	3.4	3.6	3.5	4.0	4.3	5.2
Risky total assets	7.3	7.6	7.3	7.7	8.8	8.7

Source: CentER-panel

Table 4.3: Asset and debt shares: survey data (macro shares)

	Year					
	1993	1994	1995	1996	1997	1998
ASSETS						
	As a % of total financial assets					
Total financial assets	100.0	100.0	100.0	100.0	100.0	100.0
Checking and savings accounts	35.9	36.4	32.7	30.7	30.5	35.1
Bonds	3.0	2.1	1.9	1.9	1.8	2.2
Stocks	21.4	20.6	22.0	24.0	25.3	23.8
Mutual funds	10.9	12.0	10.6	12.2	11.7	13.3
Defined contribution plans	9.7	11.5	11.4	10.3	8.7	7.9
Cash value of life insurance	12.9	12.0	14.4	13.9	12.1	10.4
Employer-sponsored saving plans	1.1	1.0	1.8	2.3	3.1	2.9
Other financial assets	5.3	4.3	5.2	4.7	6.8	4.5
	As a % of total assets					
Total financial assets	29.6	29.0	28.1	29.7	28.0	27.6
Total non financial assets	70.4	71.0	71.9	70.3	72.0	72.4
Real estate	59.7	59.9	60.4	60.1	61.9	63.8
House	53.8	53.7	54.2	55.1	55.4	58.8
Other real estate	5.9	6.2	6.3	5.0	6.5	4.9
Business equity	5.0	5.8	6.4	4.9	5.0	3.7
Stock of durable goods	5.7	5.4	5.2	5.2	5.1	4.9
Total assets	100.0	100.0	100.0	100.0	100.0	100.0
LIABILITIES						
	As a % of total debt					
Total debt	100.0	100.0	100.0	100.0	100.0	100.0
Mortgage and real estate debt	87.9	88.5	88.4	89.2	89.0	88.5
Consumer credit	6.0	5.9	5.2	4.9	5.8	5.6
Other debt	4.7	4.3	4.9	4.4	3.7	3.7
Study loans	0.7	0.7	0.8	0.6	0.5	0.8
Negative balance checking account	0.7	0.5	0.8	0.9	1.0	1.4
	As a % of total assets					
Total debt	29.3	27.4	27.6	27.1	25.8	24.3
Net worth	70.7	72.6	72.4	72.9	74.2	75.7
	As a % of total financial assets					
Clearly safe assets	35.9	36.4	32.7	30.7	30.5	35.1
Fairly safe assets	34.4	34.1	37.1	36.5	35.3	28.9
Safe assets	70.3	70.6	69.9	67.2	65.8	64.1
Risky financial assets	29.7	29.4	30.1	32.8	34.2	35.9
Risky total assets						
	As a % of total assets					
Clearly safe assets	10.6	10.6	9.2	9.1	8.5	9.7
Fairly safe assets	10.2	9.9	10.4	10.9	9.9	8.0
Safe assets	20.8	20.5	19.6	20.0	18.5	17.7
Risky financial assets	8.8	8.6	8.5	9.8	9.6	9.9
Risky total assets	19.7	20.5	21.1	19.6	21.0	18.6

Source: CentER-panel

Table 4.4: Diversification of households' financial portfolios

Asset combination			1993	1994	1995	1996	1997	1998
Clearly safe	Fairly safe	Risky						
0	0	0	6.7	6.0	4.5	4.0	4.3	4.6
1	0	0	39.2	41.4	33.2	30.7	31.1	31.5
0	1	0	1.0	1.0	1.5	1.0	2.1	1.8
0	0	1	0.1	0.2	0.2	0.1	0.0	0.2
1	1	0	32.0	31.0	38.9	40.5	37.6	34.4
1	0	1	5.2	5.6	4.3	4.7	5.2	5.4
0	1	1	0.1	0.1	0.2	0.1	0.2	0.2
1	1	1	15.8	14.6	17.2	18.7	19.4	21.9

Table 4.5: Asset and debt ownership rates by net worth quartiles: survey data

	1997 below p25	p25<x<p50	p50<x<p75	x>p75	x>p95
ASSETS					
Total financial assets	87.1	98.1	98.9	98.8	99.0
Checking and savings accounts	83.1	95.7	96.8	97.7	96.6
Bonds	0.1	1.8	2.6	9.6	15.9
Stocks	0.8	5.1	13.5	38.1	63.9
Mutual funds	1.3	14.8	19.9	40.0	49.6
Defined contribution plans	6.3	11.7	20.0	32.0	37.3
Cash value of life insurance	5.6	12.8	44.3	38.2	32.0
Employer-sponsored saving plans	18.2	31.1	55.3	41.9	23.6
Other financial assets	9.4	12.9	15.3	22.4	36.2
Total non financial assets	49.3	85.0	98.8	100.0	100.0
Real estate	5.0	18.2	85.9	95.2	100.0
House	5.0	16.9	84.6	93.5	96.1
Other real estate	0.0	2.2	3.2	17.1	35.1
Business	0.6	5.0	5.6	17.2	27.0
Stock of durable goods	48.3	80.8	87.5	90.4	90.6
Total assets	89.7	100.0	100.0	100.0	100.0
LIABILITIES					
Total debt	62.6	37.8	81.7	80.7	74.8
Mortgage and real estate debt	5.0	16.8	76.0	74.4	68.0
Consumer credit	47.7	23.3	34.2	24.3	22.6
Other debt	11.0	3.7	6.2	7.1	12.5
Study loans	7.8	4.7	1.4	1.4	1.1
Negative balance checking account	27.2	9.1	14.7	14.2	15.3
Net worth	94.2	100.0	100.0	100.0	100.0
Total assets					
Clearly safe assets	83.1	95.7	96.8	97.7	96.6
Fairly safe assets	30.4	50.2	77.6	79.4	84.4
Safe assets	87.1	98.1	98.7	98.8	99.0
Risky financial assets	1.2	16.4	24.2	57.4	75.8
Risky total assets	1.8	22.3	30.6	71.4	95.2

Source: CentER-panel

Table 4.6: Composition of assets by wealth quartiles: micro shares

			1997		
	below p25	p25<x<p50	p50<x<p75	x>p75	x>p95
ASSETS					
Total financial assets	100.0	100.0	100.0	100.0	100.0
Checking and savings accounts	79.7	70.3	53.1	40.6	27.4
Bonds	0.0	0.3	0.4	1.6	1.8
Stocks	0.4	1.9	3.8	13.0	29.1
Mutual funds	0.7	5.2	5.2	11.7	12.8
Defined contribution plans	3.5	2.3	5.3	8.9	11.8
Cash value of life insurance	2.4	5.4	18.2	14.1	8.5
Employer-sponsored saving plans	9.8	8.8	10.3	4.2	1.1
Other financial assets	3.4	5.8	3.8	5.9	7.5
			As a % of total assets		
Total financial assets	65.3	54.0	22.6	27.7	41.3
Total non financial assets	34.7	46.0	77.4	72.3	58.7
Real estate	4.8	15.5	69.7	63.0	48.7
House	4.8	14.4	68.4	57.8	38.6
Other real estate	0.0	1.1	1.3	5.2	10.0
Business equity	0.4	3.3	1.5	5.1	7.3
Stock of durable goods	29.5	27.2	6.2	4.3	2.7
Total assets	100.0	100.0	100.0	100.0	100.0
LIABILITIES					
			As a % of total debt		
Total debt	100.0	100.0	100.0	100.0	100.0
Mortgage and real estate debt	6.3	41.3	87.6	86.9	82.8
Consumer credit	60.2	39.6	9.0	5.7	4.2
Other debt	7.9	4.0	2.0	3.7	7.9
Study loans	9.9	6.4	0.1	0.4	0.4
Negative balance checking account	15.8	8.7	1.3	3.4	4.7
			As a % of total financial assets		
Clearly safe assets	79.7	70.3	53.1	40.6	27.4
Fairly safe assets	19.9	23.9	38.8	36.8	35.0
Safe assets	99.6	94.2	91.9	77.4	62.4
Risky financial assets	0.4	5.8	8.1	22.6	37.6
Risky total assets					
			As a % of total assets		
Clearly safe assets	53.8	38.2	11.4	8.0	7.3
Fairly safe assets	11.3	11.6	7.9	10.9	14.1
Safe assets	65.1	49.7	19.2	18.8	21.4
Risky financial assets	0.2	4.2	3.3	8.9	20.0
Risky total assets	0.6	8.7	6.1	19.1	37.3

Source: CentER-panel

Table 4.7: Asset and debt ownership rates by age class

	<30	30-39	40-49	50-59	60-69	70+
			1997			
ASSETS						
Total financial assets	95.3	96.9	94.9	96.9	96.8	91.7
Checking and savings accounts	94.8	92.6	91.8	95.2	95.3	90.5
Bonds	0.0	1.3	2.1	4.4	6.2	6.4
Stocks	4.7	6.8	13.4	18.4	17.8	21.2
Mutual funds	10.0	14.5	14.3	24.3	23.1	25.1
Defined contribution plans	7.2	15.8	22.9	23.6	15.6	4.0
Cash value of life insurance	13.8	33.1	34.3	30.0	14.3	3.8
Employer-sponsored saving plans	33.2	49.2	53.0	46.1	11.0	0.5
Other financial assets	15.2	11.5	15.7	14.7	16.8	17.4
Total non financial assets	62.8	83.0	85.9	90.6	83.5	72.4
Real estate	16.7	48.3	57.6	62.3	51.5	34.3
House	16.7	47.0	57.4	61.3	51.0	30.4
Other real estate	0.7	3.0	4.9	9.5	4.8	7.7
Business	4.3	7.1	10.9	8.5	3.0	3.4
Stock of durable goods	59.9	75.8	78.5	84.3	77.9	65.7
Total assets	96.3	97.7	96.5	99.3	98.9	93.5
LIABILITIES						
Total debt	66.5	72.6	77.0	74.0	54.5	28.3
Mortgage and real estate debt	15.1	42.5	53.3	55.4	38.6	16.4
Consumer credit	26.9	38.8	40.1	37.0	24.2	9.8
Other debt	6.5	9.9	8.5	6.6	4.3	3.8
Study loans	24.8	8.1	1.7	1.4	0.7	0.7
Negative balance checking account	31.8	20.3	18.9	16.2	10.8	4.9
Net worth	100.0	99.7	98.4	99.3	98.9	94.2
Total assets						
Clearly safe assets	94.8	92.6	91.8	95.2	95.3	90.5
Fairly safe assets	54.4	67.0	71.3	66.4	46.5	27.4
Safe assets	95.3	96.8	94.9	96.9	96.8	91.7
Risky financial assets	8.7	15.6	21.0	31.1	31.1	35.1
Risky total assets	12.8	22.9	29.6	41.2	32.8	38.8

Source: CentER-panel

Table 4.8: Composition of assets by age class: micro shares

| | 1997 | | | | | |
	<30	30-39	40-49	50-59	60-69	70+
ASSETS						
			As a % of total financial assets			
Total financial assets	100.0	100.0	100.0	100.0	100.0	100.0
Checking and savings accounts	73.1	59.0	55.2	55.3	66.2	69.2
Bonds	0.0	0.2	0.5	0.3	0.8	2.1
Stocks	1.6	2.5	3.3	5.7	6.4	10.6
Mutual funds	2.0	4.6	4.2	6.4	7.8	9.9
Defined contribution plans	0.4	4.0	5.6	7.7	6.4	0.4
Cash value of life insurance	5.8	12.5	15.4	12.2	5.1	0.7
Employer-sponsored saving plans	10.0	14.0	11.7	7.9	1.8	0.0
Other financial assets	7.1	3.3	4.1	4.5	5.4	7.2
			As a % of total assets			
Total financial assets	65.2	39.1	34.5	35.8	45.1	59.2
Total non financial assets	34.8	60.9	65.5	64.2	54.9	40.8
Real estate	14.3	39.8	45.2	45.7	37.3	25.0
House	14.0	38.4	43.8	42.5	36.0	21.7
Other real estate	0.3	1.5	1.4	3.2	1.3	3.3
Business equity	1.5	2.4	4.4	3.1	0.9	1.3
Stock of durable goods	19.0	18.6	15.9	15.5	16.7	14.5
Total assets	100.0	100.0	100.0	100.0	100.0	100.0
LIABILITIES						
			As a % of total debt			
Total debt	100.0	100.0	100.0	100.0	100.0	100.0
Mortgage and real estate debt	22.0	55.1	64.5	69.5	67.0	54.2
Consumer credit	24.1	28.4	24.5	22.5	22.7	25.6
Other debt	7.0	4.8	3.5	3.0	4.1	9.1
Study loans	28.3	6.1	1.1	0.2	1.3	1.3
Negative balance checking account	18.6	5.6	6.4	4.9	4.9	9.8
			As a % of total financial assets			
Clearly safe assets	73.1	59.0	55.2	55.3	66.2	69.2
Fairly safe assets	23.8	35.6	38.2	33.8	21.4	11.2
Safe assets	96.9	94.6	93.4	89.2	87.6	80.4
Risky financial assets	3.1	5.4	6.6	10.8	12.4	19.6
			As a % of total assets			
Clearly safe assets	51.1	25.2	20.6	20.5	30.9	41.8
Fairly safe assets	11.9	11.0	11.5	11.1	9.3	6.2
Safe assets	63.0	36.2	32.1	31.6	40.2	48.0
Risky financial assets	2.2	2.9	2.4	4.2	4.9	11.2
Risky total assets	4.0	6.8	8.2	10.4	7.1	15.9

Source: CentER-panel

Table 6.1: Static Models for Asset Ownership

exogenous variables	risky financial assets marginal effect	*t-value on coeff.*	fairly safe financial assets marginal effect	*t-value on coeff.*	employer sponsored savings plans marginal effect	*t-value on coeff.*
Nobs	8389		8388		8389	
Log likelihood	-3703.88		-4015.55		-4069.60	
Pseudo R2	0.2877		0.2333		0.2620	
age: under 40	-0.0001	-0.02	0.0115	3.24	0.0163	4.68
age: 40-65	0.0022	0.89	-0.0017	-0.69	0.0060	2.36
age: 65+	0.0148	3.14	-0.0216	-4.77	-0.0459	-4.71
low education*	-0.0945	-3.51	-0.0163	-0.58	0.0426	1.30
intermediate/low education*	-0.0648	-3.13	-0.0532	-2.31	0.0481	1.99
intermediate/high education*	-0.0833	-4.47	-0.0007	-0.03	0.0587	2.62
vocational education, level 1*	-0.1379	-6.45	-0.0412	-1.79	0.0513	2.04
vocational education, level 2*	-0.1048	-5.52	-0.0476	-2.21	0.0642	2.92
vocational education, level 3*	-0.0411	-2.75	-0.0204	-1.17	0.0380	2.28
reference: university education						
noncapital income: 1st decile	0.0024	0.48	-0.0005	-0.10	0.0009	0.14
noncapital income: 2nd decile	0.0022	0.96	-0.0019	-1.01	-0.0015	-0.56
noncapital income: 3rd decile	0.0051	1.76	0.0058	2.35	0.0082	2.49
noncapital income: 4th decile	0.0026	0.78	0.0050	1.70	0.0074	2.16
noncapital income: 5th decile	-0.0074	-2.48	0.0011	0.41	0.0046	1.58
noncapital income: 6th decile	0.0010	0.44	0.0005	0.24	-0.0017	-0.74
noncapital income: 7th decile	0.0049	2.44	0.0042	2.04	0.0049	2.43
noncapital income: 8th decile	-0.0047	-2.87	0.0000	0.03	-0.0019	-1.12
noncapital income: 9th decile	0.0037	4.11	0.0022	1.88	0.0032	3.16
noncapital income: 10th decile	0.0000	-0.53	0.0000	0.23	-0.0004	-1.33
high income sub-panel*	0.0255	1.63	0.0333	1.93	-0.0365	-2.20
total net worth: 1st-3rd decile	0.0027	1.69	0.0019	1.66	0.0014	1.07
total net worth: 4th decile	0.0235	4.07	0.0369	7.04	0.0164	3.01
total net worth: 5th decile	-0.0050	-0.71	-0.0067	-0.97	0.0047	0.68
total net worth: 6th decile	0.0127	2.02	-0.0006	-0.09	0.0020	0.30
total net worth: 7th & 8th decile	0.0075	4.62	0.0048	2.60	-0.0001	-0.03
total net worth: 9th decile	0.0077	6.04	0.0065	4.18	0.0017	1.19
total net worth: 10th decile	0.0008	3.42	0.0009	3.04	-0.0005	-2.10
unemployed*	-0.0530	-1.15	-0.1163	-2.65	-0.2202	-6.10
retired*	0.0870	3.38	-0.1781	-6.95	-0.2735	-12.08
disabled*	-0.0502	-1.36	-0.1805	-5.16	-0.2418	-8.46
other labor market status*	0.0543	1.68	-0.1070	-3.65	-0.1939	-6.98
self-employed*	0.1034	3.60	-0.0865	-2.79	-0.2233	-9.86
reference: paid employment						
# of adults	-0.0406	-2.84	0.0251	1.83	0.0419	2.77
# of children, 0-6	-0.0109	-0.95	0.0020	0.17	-0.0143	-1.31
# of children, 7-12	-0.0197	-1.83	0.0080	0.72	0.0141	1.38
# of children, 13-19	-0.0129	-1.36	-0.0030	-0.30	-0.0172	-1.84
# of children, 20+	-0.0183	-1.24	-0.0062	-0.40	0.0452	2.99
# of children not living at home	-0.0035	-0.74	0.0047	0.99	-0.0055	-0.92
exp. Income to rise 20%+*	-0.1027	-3.99	-0.0723	-2.35	-0.0485	-1.73
exp. Income to rise 10-20%*	-0.0840	-3.54	0.0031	0.12	0.0224	0.86
exp. Income to rise, 5-10% *	-0.0616	-2.27	-0.0060	-0.21	-0.0074	-0.26

exp. Income to change, +/- 5%*	-0.0625	-2.86	-0.0399	-1.81	-0.0157	-0.69
exp. Income to fall, 5-10%*	-0.0440	-1.15	-0.0144	-0.37	0.0140	0.33
exp. Income to fall, 10-20%*	-0.1117	-4.28	-0.0140	-0.46	-0.0122	-0.40
reference: exp. Income to fall, 20%+						
very certain about inc.exp.*	-0.0298	-1.57	-0.0247	-1.25	-0.0183	-0.89
rather certain about inc.exp.*	-0.0262	-1.86	-0.0069	-0.50	0.0173	1.22
reference: not certain						
interested in fin. matters: don't know*	-0.2305	-4.85	-0.1866	-2.80	-0.1718	-2.37
interested in fin. matters: hly disagree*	-0.2791	-16.09	-0.1866	-6.60	-0.0953	-4.02
interested in fin. matters: level 2*	-0.2635	-15.70	-0.1602	-5.87	-0.1011	-4.52
interested in fin. matters: level 3*	-0.2209	-12.69	-0.1311	-4.68	-0.0782	-3.36
interested in fin. matters: level 4*	-0.1845	-10.24	-0.1163	-4.29	-0.0345	-1.48
interested in fin. matters: level 5*	-0.1254	-6.43	-0.0481	-1.73	-0.0316	-1.31
interested in fin. matters: level 6*	-0.0269	-1.22	-0.0084	-0.29	0.0262	1.03
ref: int. in fin. matters: highly agree						
"risk averse investment": don't know*	-0.0913	-2.77	-0.0658	-2.56	-0.0087	-0.31
"risk averse investment": hly disagree*	-0.0001	0.00	-0.0468	-1.48	-0.0465	-1.42
"risk averse investment": level 2*	0.1089	3.52	0.0314	1.10	0.0019	0.07
"risk averse investment": level 3*	0.1370	5.70	0.0101	0.44	0.0062	0.27
"risk averse investment": level 4*	0.1117	5.50	-0.0008	-0.04	-0.0191	-0.97
"risk averse investment": level 5*	0.0993	5.22	0.0056	0.31	0.0029	0.15
"risk averse investment": level 6*	0.0545	3.32	-0.0052	-0.33	-0.0172	-1.01
ref: "risk averse inv.": highly agree						
time variable, 1	-0.0024	-0.22	0.0491	4.30	0.1329	11.53
time variable, 2	-0.0144	-1.13	0.0094	0.75	0.0368	2.74
time variable, 3	0.0129	1.32	-0.0422	-4.38	-0.1187	-11.37
reference: time variable, 4						
born 1917-1926*	-0.0495	-0.79	-0.2712	-3.73	-0.3288	-4.49
born 1927-1936*	0.0383	0.42	-0.3527	-3.67	-0.4019	-3.84
born 1937-1946*	0.0610	0.63	-0.2959	-2.95	-0.3625	-2.92
born 1947-1956*	0.0628	0.61	-0.2290	-2.18	-0.3325	-2.31
born 1957-1966*	0.0633	0.58	-0.1580	-1.42	-0.2222	-1.46
born after 1967*	0.0062	0.05	-0.0716	-0.59	-0.1014	-0.61
reference: born before 1917						
observed "1"	0.3109		0.6832		0.3669	
predicted "1"	0.2536		0.7283		0.2946	

Note: marginal effects for continuous variables; effect of change in dummy variable from 0 to 1 with asterisk (*)

Tests for joint significance of parameter estimates

variable group	df	c2	P-value	c2	P-value	c2	P-value
age	3	11.25	0.0105	34.55	0.0000	49.65	0.0000
education	6	60.20	0.0000	10.21	0.1162	11.05	0.0868
noncapital income	10	71.12	0.0000	126.61	0.0000	187.42	0.0000
total net worth	7	553.55	0.0000	343.74	0.0000	69.45	0.0000
labor market variables	5	27.89	0.0000	64.30	0.0000	283.39	0.0000
household composition	6	19.64	0.0032	6.35	0.3847	22.93	0.0008
income expectation	6	26.97	0.0001	14.89	0.0211	11.15	0.0839
income certainty	2	3.82	0.1479	1.62	0.4453	4.93	0.0851
interest in financial matters	7	563.07	0.0000	98.17	0.0000	62.38	0.0000
risk aversion	7	76.84	0.0000	12.19	0.0944	4.83	0.6805
orthogonal time dummies	3	1.90	0.5933	57.28	0.0000	339.55	0.0000
cohort dummies	6	10.86	0.0929	24.73	0.0004	73.64	0.0000

Table 7.1: Dynamic Models for Asset Ownership

exogenous variables	risky financial assets		fairly safe financial assets		employer sponsored savings plans	
Nobs	8389		8388		8389	
Log likelihood	-339.47		-404.23		-256.65	
Pseudo R2	0.9347		0.9228		0.9535	
	marginal effect	*t-value on coeff.*	marginal effect	*t-value on coeff.*	marginal effect	*t-value on coeff.*
lagged endogenous variable*	0.9871	35.49	0.9803	41.99	0.9925	30.82
age: under 40	0.0147	2.01	-0.0016	-0.22	-0.0040	-0.43
age: 40-65	0.0056	1.17	0.0006	0.12	0.0078	1.16
age: 65+	-0.0180	-2.13	0.0192	2.54	-0.0307	-1.32
low education*	-0.0461	-0.83	0.0574	1.28	0.1247	1.37
intermediate/low education*	-0.0812	-2.28	-0.0805	-1.70	-0.0294	-0.48
intermediate/high education*	0.0162	0.39	-0.0812	-1.76	0.0288	0.48
vocational education, level 1*	-0.0128	-0.30	0.0232	0.57	0.1320	1.84
vocational education, level 2*	-0.0440	-1.21	-0.0517	-1.18	0.0759	1.23
vocational education, level 3*	-0.0071	-0.23	0.0036	0.11	0.0074	0.16
reference: university education						
noncapital income: 1st decile	0.0130	1.43	-0.0033	-0.41	0.0215	1.53
noncapital income: 2nd decile	-0.0073	-1.77	0.0051	1.49	-0.0090	-1.58
noncapital income: 3rd decile	0.0151	2.79	-0.0037	-0.82	0.0164	2.20
noncapital income: 4th decile	-0.0003	-0.05	0.0069	1.22	-0.0036	-0.46
noncapital income: 5th decile	-0.0122	-2.29	-0.0041	-0.82	0.0029	0.39
noncapital income: 6th decile	0.0009	0.20	0.0026	0.64	-0.0060	-0.99
noncapital income: 7th decile	0.0063	1.58	0.0008	0.20	0.0055	0.99
noncapital income: 8th decile	-0.0038	-1.17	0.0010	0.27	-0.0047	-0.98
noncapital income: 9th decile	0.0027	1.30	-0.0022	-0.89	0.0028	0.97
noncapital income: 10th decile	-0.0003	-0.53	0.0005	0.64	0.0000	-0.05
high income sub-panel*	-0.0385	-1.29	0.0243	0.76	0.0225	0.47
total net worth: 1st-3rd decile	0.0013	0.61	0.0002	0.15	0.0016	0.65
total net worth: 4th decile	0.0092	0.87	0.0241	2.42	-0.0010	-0.07
total net worth: 5th decile	-0.0050	-0.37	-0.0120	-0.90	0.0071	0.39
total net worth: 6th decile	-0.0094	-0.76	-0.0051	-0.41	-0.0197	-1.14
total net worth: 7th & 8th decile	0.0030	0.93	0.0013	0.39	-0.0021	-0.41
total net worth: 9th decile	0.0041	1.61	0.0014	0.52	0.0080	1.91
total net worth: 10th decile	0.0002	0.41	0.0001	0.17	-0.0007	-0.99
unemployed*	0.0476	0.50	0.0233	0.34	-0.1450	-2.04
retired*	0.0679	1.29	-0.0690	-1.44	-0.2097	-3.92
disabled*	0.0027	0.04	0.0026	0.05	-0.0575	-0.69
other labor market status*	-0.0003	-0.01	-0.0335	-0.64	-0.1196	-1.73
self-employed*	0.0222	0.40	0.0831	1.86	-0.0496	-0.69
reference: paid employment						
# of adults	0.0164	0.59	0.0315	1.25	-0.0022	-0.06
# of children, 0-6	0.0044	0.21	-0.0155	-0.71	-0.0027	-0.10
# of children, 7-12	-0.0213	-0.98	-0.0294	-1.41	-0.0293	-1.05
# of children, 13-19	-0.0159	-0.84	0.0032	0.16	-0.0286	-1.07
# of children, 20+	-0.0189	-0.70	0.0483	1.66	0.0418	1.04
# of children not living at home	-0.0034	-0.38	-0.0057	-0.66	-0.0273	-1.76
exp. Income to rise 20%+*	-0.0625	-1.26	-0.0161	-0.28	-0.0252	-0.34
exp. Income to rise 10-20%*	0.0002	0.00	0.0239	0.52	0.0581	0.82
exp. Income to rise, 5-10% *	0.0193	0.31	-0.0521	-0.90	0.0230	0.29

exp. Income to change, +/- 5%*	0.0341	0.77	0.0025	0.06	0.0042	0.07
exp. Income to fall, 5-10%*	0.1386	1.48	0.0719	1.27	0.2240	1.90
exp. Income to fall, 10-20%*	0.0792	1.16	0.0083	0.15	0.0192	0.24
reference: exp. Income to fall, 20%+						
very certain about inc.exp.*	-0.0258	-0.71	-0.0626	-1.57	0.0040	0.07
rather certain about inc.exp.*	0.0108	0.40	-0.0222	-0.85	-0.0617	-1.59
reference: not certain						
interested in fin. matters: don't know*	-0.0912	-0.76	-0.0713	-0.52	-0.1338	-0.69
interested in fin. matters: hly disagree*	-0.1218	-3.36	0.0113	0.24	-0.0940	-1.59
interested in fin. matters: level 2*	-0.0789	-2.06	-0.0165	-0.35	-0.1023	-1.83
interested in fin. matters: level 3*	-0.0680	-1.75	-0.0278	-0.56	-0.0968	-1.69
interested in fin. matters: level 4*	0.0021	0.05	0.0102	0.22	-0.0652	-1.09
interested in fin. matters: level 5*	-0.0552	-1.41	0.0164	0.35	-0.0727	-1.22
interested in fin. matters: level 6*	0.0357	0.73	0.0044	0.09	-0.0162	-0.25
ref: int. in fin. matters: highly agree						
"risk averse investment": don't know*	-0.0265	-0.40	0.0005	0.01	-0.0508	-0.76
"risk averse investment": hly disagree*	0.1259	1.58	-0.0511	-0.77	-0.0532	-0.66
"risk averse investment": level 2*	0.1114	1.69	-0.0187	-0.33	0.0061	0.08
"risk averse investment": level 3*	0.1250	2.38	-0.0894	-1.77	-0.1087	-2.14
"risk averse investment": level 4*	-0.0201	-0.54	-0.0792	-1.99	-0.1198	-2.75
"risk averse investment": level 5*	0.0822	2.09	-0.0282	-0.78	-0.0428	-0.90
"risk averse investment": level 6*	0.0259	0.79	-0.0266	-0.87	-0.0436	-1.01
ref: "risk averse inv.": highly agree						
time variable, 1	-0.0194	-0.87	0.0288	1.29	0.0079	0.25
time variable, 2	-0.0700	-3.05	0.0222	1.01	-0.0611	-1.80
time variable, 3	0.0632	3.81	-0.0309	-1.95	0.0290	1.18
reference: time variable, 4						
born 1917-1926*	-0.1604	-3.31	0.1232	1.50	-0.1864	-1.06
born 1927-1936*	-0.2239	-2.88	0.1927	2.02	-0.2947	-1.43
born 1937-1946*	-0.2166	-2.24	0.2050	1.93	-0.2904	-1.21
born 1947-1956*	-0.2247	-1.79	0.2484	1.96	-0.2751	-0.90
born 1957-1966*	-0.1436	-1.06	0.2144	1.84	-0.2904	-1.19
born after 1967*	-0.1022	-0.75	0.1435	1.62	-0.1657	-0.71
reference: born before 1917						
observed "1"	0.3109		0.6832		0.3669	
predicted "1"	0.1254		0.8611		0.1731	

Note: marginal effects for continuous variables; effect of change in dummy variable from 0 to 1 with asterisk (*)

Tests for joint significance of parameter estimates

variable group	df	c2	P-value	c2	P-value	c2	P-value
age	3	9.45	0.0239	6.60	0.0857	2.91	0.4063
education	6	8.41	0.2096	14.15	0.0280	7.38	0.2871
noncapital income	10	21.52	0.0178	11.27	0.3367	11.63	0.3108
total net worth	7	11.52	0.1177	9.54	0.2165	7.16	0.4124
labor market variables	5	2.33	0.8019	7.71	0.1729	18.47	0.0024
household composition	6	2.38	0.8819	6.85	0.3353	5.89	0.4354
income expectation	6	9.08	0.1690	4.80	0.5692	6.52	0.3679
income certainty	2	1.49	0.4740	2.48	0.2901	3.63	0.1625
interest in financial matters	7	30.26	0.0001	2.55	0.9230	6.40	0.4935
risk aversion	7	14.74	0.0395	6.11	0.5273	10.47	0.1633
orthogonal time dummies	3	14.65	0.0021	4.47	0.2151	5.10	0.1643
cohort dummies	6	16.00	0.0137	5.56	0.4746	16.09	0.0133

Table 8.1: Multinomial Logit Model for Diversification of Financial Portfolios

	Clearly safe and fairly safe financial assets		Clearly safe and risky financial assets		All three types	
Nobs	8250					
Log likelihood	-7516.67					
Pseudo R2	0.2530					
	coefficient estimate	*t-value*	coefficient estimate	*t-value*	coefficient estimate	*t-value*
exogenous variables						
constant	-1.6441	-1.51	-2.7249	-1.34	-0.8384	-0.61
age: under 40	0.0545	2.76	-0.0170	-0.38	0.0511	1.83
age: 40-65	-0.0071	-0.48	0.0395	1.31	0.0081	0.44
age: 65+	-0.0640	-2.00	0.1412	4.20	-0.0555	-1.60
low education	-0.0267	-0.16	-0.3960	-1.35	-0.6056	-2.66
intermediate/low education	-0.2638	-1.96	-0.4378	-1.98	-0.6169	-3.76
intermediate/high education	-0.0327	-0.24	-0.4798	-2.21	-0.5070	-3.24
vocational education, level 1	-0.1265	-0.95	-0.6145	-2.48	-1.0352	-5.46
vocational education, level 2	-0.2751	-2.20	-0.7077	-3.07	-0.8906	-5.64
vocational education, level 3	-0.2167	-1.98	-0.4583	-2.56	-0.3742	-3.04
reference: university education						
noncapital income: 1st decile	-0.0179	-0.65	0.0045	0.10	0.0002	0.01
noncapital income: 2nd decile	-0.0100	-0.89	0.0064	0.33	0.0046	0.27
noncapital income: 3rd decile	0.0253	1.79	0.0310	1.29	0.0490	2.34
noncapital income: 4th decile	0.0378	2.25	0.0366	1.23	0.0371	1.58
noncapital income: 5th decile	0.0148	0.97	-0.0345	-1.22	-0.0316	-1.51
noncapital income: 6th decile	-0.0016	-0.13	0.0028	0.12	0.0069	0.41
noncapital income: 7th decile	0.0235	1.91	0.0248	1.08	0.0464	3.06
noncapital income: 8th decile	-0.0008	-0.07	-0.0253	-1.21	-0.0259	-1.95
noncapital income: 9th decile	0.0121	1.60	0.0270	1.89	0.0309	3.74
noncapital income: 10th decile	0.0000	0.03	-0.0086	-1.56	-0.0002	-0.29
high income sub-panel	0.2777	2.43	0.3298	1.82	0.3399	2.69
total net worth: 1st-3rd decile	0.0100	1.49	0.1132	2.41	0.0116	0.79
total net worth: 4th decile	0.1743	5.91	0.0330	0.48	0.3052	6.92
total net worth: 5th decile	-0.0286	-0.72	-0.0166	-0.21	-0.0369	-0.71
total net worth: 6th decile	-0.0274	-0.72	-0.0058	-0.08	0.0470	1.01
total net worth: 7th & 8th decile	0.0256	2.20	0.0499	2.71	0.0621	4.88
total net worth: 9th decile	0.0160	1.30	0.0172	1.10	0.0569	4.64
total net worth: 10th decile	0.0102	2.16	0.0088	1.72	0.0144	3.10
unemployed	-0.4714	-2.10	-0.2317	-0.42	-0.8012	-2.35
retired	-0.7153	-4.86	1.1282	4.37	-0.4093	-2.31
disabled	-0.8334	-4.66	-0.2852	-0.66	-0.9594	-3.67
other labor market status	-0.4779	-2.99	0.5695	1.84	-0.1808	-0.83
self-employed	-0.2760	-1.40	1.1372	3.84	0.0845	0.39
reference: paid employment						
# of adults	0.0870	1.07	-0.2574	-1.83	-0.1490	-1.43
# of children, 0-6	0.0847	1.23	0.2573	1.81	-0.0352	-0.40
# of children, 7-12	0.0641	0.98	-0.0519	-0.33	-0.0516	-0.62
# of children, 13-19	0.0175	0.30	0.1064	0.79	-0.0787	-1.07
# of children, 20+	0.0002	0.00	-0.0345	-0.20	-0.1260	-1.12
# of children not living at home	0.0275	0.94	-0.0273	-0.67	0.0061	0.18
exp. Income to rise 20%+	-0.4771	-2.71	-1.1505	-3.39	-0.9247	-4.27
exp. Income to rise 10-20%	-0.0448	-0.28	-0.6998	-2.38	-0.4413	-2.27
exp. Income to rise, 5-10%	-0.1222	-0.70	-0.6924	-2.12	-0.3802	-1.77

exp. Income to change, +/- 5%	-0.2728	-1.99	-0.5664	-2.55	-0.5083	-3.11
exp. Income to fall, 5-10%	-0.1592	-0.67	-0.5352	-1.34	-0.2450	-0.84
exp. Income to fall, 10-20%	-0.1646	-0.91	-1.0650	-3.29	-0.7817	-3.56
reference: exp. Income to fall, 20%+						
very certain about inc.exp.	-0.0284	-0.24	0.1465	0.74	-0.2392	-1.67
rather certain about inc.exp.	0.0145	0.18	-0.0228	-0.15	-0.1559	-1.52
reference: not certain						
interested in fin. matters: don't know	-0.4155	-1.14	-38.0295	0.00	-2.0786	-3.46
interested in fin. matters: hly disagree	-0.5854	-3.15	-2.0585	-7.41	-2.7094	-12.91
interested in fin. matters: level 2	-0.4941	-2.69	-1.6635	-6.45	-2.4326	-12.34
interested in fin. matters: level 3	-0.4334	-2.30	-1.5773	-5.97	-1.9574	-9.91
interested in fin. matters: level 4	-0.3830	-2.05	-1.1575	-4.68	-1.5428	-8.07
interested in fin. matters: level 5	-0.1703	-0.86	-0.8209	-3.15	-0.8969	-4.50
interested in fin. matters: level 6	0.4364	1.97	0.4164	1.55	0.1361	0.62
ref: int. in fin. matters: highly agree						
"risk averse investment": don't know	-0.3700	-2.74	-0.9264	-2.22	-0.7214	-2.66
"risk averse investment": hly disagree	-0.3838	-2.28	-0.8357	-1.71	0.0299	0.12
"risk averse investment": level 2	0.1173	0.66	0.5088	1.55	0.7763	3.57
"risk averse investment": level 3	-0.0303	-0.21	0.6648	2.85	0.7426	4.35
"risk averse investment": level 4	-0.1253	-1.12	0.3314	1.72	0.5346	3.83
"risk averse investment": level 5	-0.0048	-0.04	0.4230	2.32	0.5630	4.19
"risk averse investment": level 6	-0.1473	-1.60	0.0700	0.44	0.2643	2.25
ref: "risk averse inv.": highly agree						
time variable, 1	0.3402	5.07	0.1927	1.66	0.2671	3.22
time variable, 2	0.0726	0.99	0.0191	0.16	-0.0366	-0.40
time variable, 3	-0.2763	-4.93	-0.1004	-1.06	-0.1450	-2.06
reference: time variable, 4						
born 1917-1926	-0.2984	-0.59	0.2833	0.62	-1.6034	-3.38
born 1927-1936	-0.4601	-0.73	1.1773	1.86	-1.7086	-2.67
born 1937-1946	-0.0804	-0.12	1.6263	2.29	-1.3623	-2.02
born 1947-1956	0.2478	0.36	1.9575	2.33	-1.0241	-1.42
born 1957-1966	0.6493	0.90	2.4465	2.57	-0.7055	-0.92
born after 1967	1.1274	1.47	2.4157	2.15	-0.6497	-0.75
reference: born before 1917						

Note: reference category of multinomial model: clearly safe asset holdings only

Tests for joint significance of parameter estimates

variable group	df	c2	P-value	c2	P-value	c2	P-value
age	3	11.98	0.0075	21.22	0.0001	6.14	0.1049
education	6	10.00	0.1245	11.55	0.0728	45.43	0.0000
noncapital income	10	117.27	0.0000	26.40	0.0032	117.65	0.0000
total net worth	7	159.62	0.0000	75.60	0.0000	530.26	0.0000
labor market variables	5	38.76	0.0000	31.80	0.0000	21.32	0.0007
household composition	6	6.17	0.4047	7.24	0.2991	6.13	0.4082
income expectation	6	14.74	0.0224	16.65	0.0107	24.38	0.0004
income certainty	2	0.19	0.9075	1.19	0.5520	3.26	0.1956
interest in financial matters	7	52.34	0.0000	156.98	0.0000	422.87	0.0000
risk aversion	7	14.87	0.0377	25.80	0.0005	53.20	0.0000
orthogonal time dummies	3	61.46	0.0000	3.01	0.3895	20.75	0.0001
cohort dummies	6	14.18	0.0277	13.21	0.0398	17.58	0.0074

A. Appendix

This appendix lists a definition of psychological variables we have used in the analysis, and presents summary statistics on right hand side variables.

A.1 Psychological Variables

We employ four variable groups from the section on economic-psychological concepts. These relate to expectations about changes in household income, 5 years ahead, a corresponding indicator pertaining to the respondent's own certainty about his or her expectation, a measure of respondent's personal interest in financial matters, and a measure about the respondent's attitude to risky investments.

A.1.1. Income Expectation

- *Do you think the total net income of your household will increase, remain the same, or decrease, in the NEXT FIVE YEARS?*
    1 increase
    2 remain about the same
    3 decrease

Conditional on answer "1":

- *By what PERCENTAGE do you think the TOTAL net income of your household will increase in THE NEXT FIVE YEARS?*
    Percentage

Conditional on answer "3":

- *By what PERCENTAGE do you think the TOTAL net income of your household will decrease in THE NEXT FIVE YEARS?*
    Percentage

We summarized these three questions into an indicator of income expectation for seven classes, interpreting answer "2" as referring to a change of not more than 5%. The classes (and corresponding dummy variables) are:

1. Expect income to rise by 20% or more
2. Expect income to rise by 10%-20%
3. Expect income to rise by 5%-10%
4. Expect income to change by +/-5%
5. Expect income to fall by 5%-10%
6. Expect income to fall by 10%-20%
7. Expect income to fall by 20% or more

A.1.2. Income (Un)Certainty

- *How certain do you feel about this change in income?*
    1 very certain
    2 rather certain
    3 not very certain
    4 not at all certain

These four answers were directly coded into dummy variables. The last two groups were merged, since only very few respondents chose the very last group.

A.1.3 Interest in Financial Matters

The questionnaire explains:

"The following statements concern saving. Please indicate for each statement to what extent you agree or disagree

EXAMPLE

Totally disagree						totally agree
1	2	3	4	5	6	7

Imagine you are asked to what extent you agree with the following statement: 'every Saturday night I go out to meet people'. If you totally agree with this statement, please type 7. If you totally disagree with the statement, please type 1. You can also select a number somewhere in between 1 and 7; 4 is neutral. If you cannot make a choice, type 0."

The statement analyzed is:

- *I am very interested in financial matters (insurance, investments, etc.)*

The eight possible answers (including "don't know") were directly coded into dummy variables.

A.1.4. Risk Attitude

For respondents in a household with total net household income of 20,000 Dfl or more, the questionnaire explains:

"The following questions concern money, saving, and investments.
The following statements concern saving and taking risks. Please indicate for each statement to what extent you agree or disagree, on the basis of your personal opinion or experience.

Totally disagree						totally agree"
1	2	3	4	5	6	7

The statement analyzed is:

- *I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns.*

The eight possible answers (including "don't know") were directly coded into dummy variables.

A.2 Summary Statistics

The following variables have been used in the regressions (estimation sample, Nobs = 8389):

Variable	Type	Mean	Std. Dev.	Min	Max
age: under 40	S	38.3605	3.4470	22	40
age: 40-65	S	10.5079	9.6733	0	25
age: 65+	S	1.0165	3.0361	0	27
low education	D	0.0494			
intermediate/low education	D	0.1041			
intermediate/high education	D	0.1126			
vocational education, level 1	D	0.1111			
vocational education, level 2	D	0.1315			
vocational education, level 3	D	0.3053			
reference: university education	DR	0.1861			
noncapital income: 1st decile	S	9.4360	2.2089	0	10
noncapital income: 2nd decile	S	22.7178	6.9207	0	25
noncapital income: 3rd decile	S	11.3650	5.2513	0	14
noncapital income: 4th decile	S	7.6304	4.6514	0	11
noncapital income: 5th decile	S	6.9566	5.4337	0	12
noncapital income: 6th decile	S	7.2367	7.0880	0	15
noncapital income: 7th decile	S	6.3621	7.8146	0	17
noncapital income: 8th decile	S	5.3033	8.2082	0	19
noncapital income: 9th decile	S	4.5470	9.6628	0	28
noncapital income: 10th decile	S	5.6267	70.8401	0	6168
high income sub-panel	D	0.2895			
total net worth: 1st-3rd decile	S	4.7830	4.4503	-192	6
total net worth: 4th decile	S	3.2854	2.1299	0	5
total net worth: 5th decile	S	2.9366	2.3825	0	5
total net worth: 6th decile	S	2.3728	2.3289	0	5
total net worth: 7th & 8th decile	S	5.2703	6.8625	0	16
total net worth: 9th decile	S	3.1670	6.5714	0	19
total net worth: 10th decile	S	6.2549	32.7659	0	1106
unemployed	D	0.0160			
retired	D	0.2208			
disabled	D	0.0306			
other labor market status	D	0.0472			
self-employed	D	0.0598			
reference: paid employment	DR	0.6256			
# of adults	I	1.8190	0.4364	1	6
# of children, 0-6	I	0.1991	0.5404	0	4
# of children, 7-12	I	0.2199	0.5727	0	4
# of children, 13-19	I	0.2506	0.6256	0	5
# of children, 20+	I	0.1128	0.3692	0	3
# of children not living at home	I	1.0134	1.4744	0	12
exp. Income to rise 20%+	D	0.0820			
exp. Income to rise 10-20%	D	0.1374			
exp. Income to rise, 5-10%	D	0.0749			
exp. Income to change, +/- 5%	D	0.5527			
exp. Income to fall, 5-10%	D	0.0254			
exp. Income to fall, 10-20%	D	0.0591			
reference: exp. Income to fall, 20%+	DR	0.0684			
very certain about inc.exp.	D	0.1329			
rather certain about inc.exp.	D	0.6587			
reference: not certain	DR	0.2084			
interested in fin. matters: don't know	D	0.0088			
interested in fin. matters: hly disagree	D	0.1683			
interested in fin. matters: level 2	D	0.1832			

interested in fin. matters: level 3	D	0.1457
interested in fin. matters: level 4	D	0.1677
interested in fin. matters: level 5	D	0.1290
interested in fin. matters: level 6	D	0.1136
ref: int. in fin. matters: highly agree	DR	0.0837
"risk averse investment": don't know	D	0.0600
"risk averse investment": hly disagree	D	0.0350
"risk averse investment": level 2	D	0.0457
"risk averse investment": level 3	D	0.0834
"risk averse investment": level 4	D	0.1398
"risk averse investment": level 5	D	0.1680
"risk averse investment": level 6	D	0.2761
ref: "risk averse inv.": highly agree	DR	0.1920
born 1917-1926	D	0.0884
born 1927-1936	D	0.1807
born 1937-1946	D	0.2102
born 1947-1956	D	0.2779
born 1957-1966	D	0.2037
born after 1967	D	0.0255
reference: born before 1917	DR	0.0136

Note: type S means: linear spline segment, type D: dummy variable, type DR: dummy variable, reference group, type I: integer variable. Total net worth is measured in 10,000 Dfl, noncapital income is measured in 1,000 Dfl. The latter two variable groups refer to the household, all other variables pertain to characteristics of the head of the household.