

Stock Holdings in Austria

Based on micro data, this study reviews the stock holdings of Austrian households. Stock investment is not widely spread in Austria, and those stock holdings that do exist are concentrated among wealthy, high-income households. This finding from the OeNB's Survey on Financial Household Wealth (SFHW) ties in with available international data.

Pirmin Fessler,
Martin Schürz¹

JEL classification: D31, E2, G11, H31

Keywords: portfolio choice, wealth, incomplete portfolios, diversification

1 Introduction

By international comparison, the stock holdings of Austrian households are relatively moderate. Does the current structure of household financial wealth point to a strong desire for investment security, and does the low capital market participation rate reflect Austrians' conservative investment strategy? As the Deutsche Bundesbank had already observed in early 1997, a strong interest in stock investment might be interpreted as a sign of a markedly positive attitude toward risk-taking. So does this mean that Austrian investors tend to be rather risk-averse, trying to avoid the risk involved in holding stocks?

In a discussion with Werner Kretschmer, Member of the Management Board of Bank Austria Creditanstalt (BA-CA), former Austrian Federal Minister of Finance Ferdinand Lacina explained why he himself did not hold stocks: *"I don't want to be bothered with financial investment issues. Constantly observing stock price developments is simply too inconvenient. Personally, I prefer savings books – they are much more convenient."* (Lacina, 2008). So far, economic research has hardly dealt with this – presumably widespread – aversion against spending too much time on money matters. Theoretical literature focuses primarily on trying to understand rational optimizing actions taken by individuals. It is not

possible, however, to confirm or reject rational utility maximization strategies in economic models on the basis of empirical data on financial decisions, because important risk-related information is typically not available.

The fact that some portfolios exhibit a very low degree of diversification and strongly concentrate on classical forms of investment might, at first sight, indicate that these investors' risk aversion is high. Another interpretation, however, might be that the key determinants in this case are investors' insufficient financial education, their low saving capacity, a lack of stock market transparency or high entry and information costs. Moreover, depending on investors' personal circumstances – even if we assume identical preferences – making risky investments may sometimes be rational and sometimes not. It depends on a number of individual and social uncertainties (job, health, pension, etc.).

In the debate on the relative merits of a market-based and a bank-based financial system, the current literature does not identify one of the two systems as being superior in term of its influence on economic growth (Mooslechner, 2003). What is important in this context is the general level of financial sector development. Developed financial markets have a positive impact on macroeconomic performance.²

¹ The authors wish to thank Peter Mooslechner, Vanessa Redak, Lukas Reiss, Alfred Stiglbauer, Karin Wagner and Thomas Zotter for valuable suggestions and discussions. pirmin.fessler@oebn.at and martin.schuerz@oebn.at.

² For details on this topic, see the special issue of the OeNB's Focus on Austria 1/2003 entitled "Finance for Growth" (www.oebn.at/en/img/foa_20031_tcm16-8299.pdf).

Refereed by:
Christian Dreger
(German Institute
for Economic
Research – DIW
Berlin)

Hahn (2002) examined the linkage between financial development and business cycle fluctuations in 22 OECD countries over the period from 1970 to 2000, with a particular focus on the role financial development plays in the propagation of real and monetary shocks. Hahn's analyses show that both market-based and bank-based financial systems magnify monetary shocks and dampen real shocks. Interestingly, his results indicate that stock markets have a destabilizing effect on the business cycle.

The recent global financial turmoil has also left its mark on Austrian households's financial assets. Given that only few Austrian households actually hold stocks and that these holdings are concentrated among wealthy households, however, the related risks to financial stability are comparably low.

Financial wealth provides security and offers a wide range of possibilities. It has different functions for different people, depending in particular on the level of their income and financial wealth. While the less wealthy tend to focus on saving "for a rainy day," i.e. to make provisions for eventualities, it is aspects of inheritance, power and status that determine wealth accumulation for richer people (Schürz, 2008). When it comes to exploring the relation between risk-orientation and stock holdings, we may therefore not generalize (*Are Austrians risk-oriented?*). Rather, this relation has to be analyzed on the basis of social differentiation. The composition of a portfolio as such cannot be the single basis for drawing conclusions regarding the investor's risk-orientation – that is, if we are to understand the term as meaning more than just the willingness to bear financial risk with regard to one's disposable financial assets.

In general, risk is considered to be something disagreeable against which individuals try to protect themselves. In a stock exchange context, however, the term is reinterpreted and primarily associated with the chance to become rich. Financial advisors tend to see risk orientation as a value in itself and complain that even wealthy customers lack this value. In this discussion, however, it is important to distinguish between the terms risk, uncertainty and danger. To illustrate the differences, Wolfgang Bonß chooses a very colorful historic example in his book *Vom Risiko*: "While in former times sea-faring was risky for merchants, it was dangerous for sailors." Knowing people's precise personal circumstances and prospects is indispensable when it comes to assessing their willingness to take on risk. If we want to determine the actual risk a household faces at a precise moment in time, we must take into account aspects such as income (in)security, housing situation and health as well as the future security of public pension provision (for old age, work incapacity, etc.). In most cases, there are no empirical data on these issues.

In many OECD countries, economic policy focuses on privatizing collective social security systems – a move which entails new risks, dangers and uncertainties (Hacker, 2007). A public pay-as-you-go pension system means that the associated risk is borne collectively, while in private, funded pension systems risk is transferred to the individual insurance holders. In general, a restructuring of the pension system that relies on enforcement of individual old-age financial provisioning drives up the level of (direct or indirect) stock exchange participation. Economic policy agents tend to suggest

that public pension systems are no longer affordable.³ Once people begin to believe in this hypothesis, there appear to be only two alternatives: Either they accept the danger that, in old age, they might be poor and have only insufficient security coverage in case of illness or they turn these dangers into manageable risks by making individual provisions. The latter option would imply that uncertainty triggers capital market participation.

In section 2, this study gives a brief overview of the relevant literature, while section 3 provides descriptive statistics on Austrian holdings of risky assets. Section 4 presents an international comparison and analyzes the importance of risky assets in households' portfolios. Section 5 analyzes the motives for holding risky assets and the corresponding investment behavior. With the aim of examining the determinants of stock holdings more closely, section 6 provides a logit estimation. Section 7 concludes.

2 Literature Overview

In his literature survey on "Household Finance," Campbell (2006) stresses that a small group of wealthy persons may distort the information value of macroeconomic data if the wealthy exhibit an investment behavior that deviates from the average. He concludes that wealthy people are much rather willing to take on financial risks and therefore make more investments in stocks.

Benartzi and Thaler (2001) provide empirical evidence for the hypothesis that households' portfolio decisions are by far less rational and future-oriented than economic theory might suggest. In particular, they underpin their pro-

position that investors typically pursue a *1/n strategy* with regard to their defined contribution plans – i.e. the contributions paid are equally distributed across the funds covered by the savings plan. This means that the extent of stock holdings not only depends on individual investment behavior, but also on the behavior of the financial service provider.

The literature gives a number of different explanations for why households might opt for portfolios that deviate from what is considered an efficient household portfolio. The most prominent explanatory factors are lack of confidence, a low level of investor protection and insufficient financial education (Guiso et al., 2005). Guiso et al. (2002) review the theoretical literature on optimum portfolio composition. Focusing on five OECD countries (the U.S.A., Germany, Italy, the U.K. and the Netherlands), the authors show empirically that investment in risky assets goes up hand in hand with financial wealth. Basically, small investors' possibilities of diversifying their stock portfolios are rather limited. As their volume of securities is usually relatively small, a diversification of stock holdings is only possible within tight limits. Moreover, for them, entry costs are a higher barrier than for wealthier investors (Guiso et al., 2002). King and Leape (1987) assume that people's readiness to hold risky assets also depends on their age, arguing that older people have acquired more know-how on stock prices, dividends and risks in the course of their lives. Surprisingly often, however, empirical data show that the relation between investment decisions and investors' age is relatively weak (Guiso and Japelli, 2002).

³ According to Austria's government representative for the capital market Richard Schenz (2003), the majority of the population knows that the public pension system as we know it can no longer be financed.

The standard portfolio theory suggests that investors hold a combination of a “riskless asset” and a “market” portfolio, i.e. an optimal composition of risky assets (Gollier, 2002). The share of assets held in the market portfolio depends on the degree of risk aversion. According to this theory, every household should in fact hold risky assets. However, this is not the case. In fact, the share of households that have invested at least part of their financial assets in risky assets continues to be rather low in many countries. On the basis of data from 150 countries, Honohan (2006) shows that the share of risky assets in households’ total financial assets is highly concentrated and negligible for all the groups except the 5% most wealthy households.

Economic literature frequently uses the share of risky assets in investors’ portfolio as a measure of risk aversion. The term risky assets itself is problematic, as any type of investment is in fact risky. In general, however, stocks, mutual fund shares and bonds qualify as risky assets.⁴ Stocks also include equity-like securities such as dividend-right certificates and participation certificates. Mutual fund shares comprise shares in equity funds, bond funds and mixed funds as well as in real estate, hedge and money market funds. Bonds constitute a very broad investment category, comprising bank bonds, government bonds, corporate and housing bonds, mortgage bonds and municipal bonds, federal treasury bills, foreign government bonds, deposit certificates and other bonds. The definition of risky assets is rather imprecise in particular with respect to bonds, as tradeable bonds range all the way from safe – e.g.

the short-term government bonds of an OECD country – to risky. This is why the values indicated for risky assets in this study must be interpreted as the upper limit of risky asset holdings.

The analysis of household portfolios needs to take account of a broader range of investment instruments than that of corporate portfolios. Households for example often consider relatively liquid forms of saving, such as savings books, to be long-term investments.

3 Austrian Households’ Investment Behavior

Data from the OeNB’s Financial Accounts impressively illustrate the rising importance of financial assets in Austria (chart 1). Moreover, microdata serve as a basis for analyzing, in greater detail, the structure of financial assets and the decision-making process regarding capital market participation.

The OeNB’s Survey on Financial Household Wealth 2004 (SFHW) provides detailed microeconomic data on the financial portfolios of Austrian households (Beer et al., 2006). The survey also covered a number of questions regarding people’s attitude to financial topics and their respective behavior (Fessler et al., 2007).

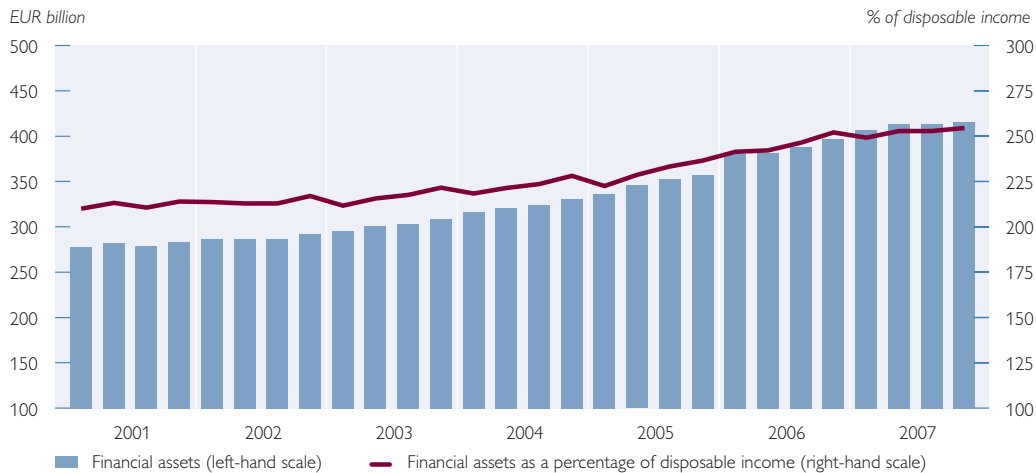
All in all, capital market participation is relatively low in Austria. According to the OeNB survey, 26% of Austrian households hold stocks and/or mutual fund shares and/or bonds, i.e. at least one risky asset.⁵ It can be assumed that in the survey households sometimes, by mistake, qualified holdings of mutual fund shares as stock holdings. It is therefore difficult to separate these components, but such a separation is not relevant when analyzing

⁴ This study applies the Luxembourg Wealth Study definition, according to which risky assets (RA) = stocks (ST) + total mutual funds (TM) + total bonds (TB).

⁵ The corresponding survey weights for Austria were used for all data from the OeNB’s SFHW 2004.

Chart 1

Gross Financial Assets of Austrian Households



Source: Statistics Austria, OeNB.

risk and the holding of risky assets as we do in this study.⁶

For quite a while, Austrian economic policy has been trying to promote stocks as an alternative to other types of investment such as building loan contracts. To enhance the acceptance of stocks as an investment instrument among the population and establish an equity culture, a number of measures have been taken, ranging from appointing a capital market representative to launching initiatives via the “Aktienforum” platform to reducing the tax rate on new shares and introducing pension products based on subsidized premiums (Schenz, 2003). In Austria, people’s awareness for stocks has increased over the last few years, which was probably attributable to the privatization of state-owned enterprises and the advertising activities of various public and private agents. The fact that 47% of respondents agreed to the statement “*It is easier to build financial wealth with stocks than with traditional savings*

books/types of savings.” provides impressive evidence that stocks are relatively broadly accepted as an investment instrument.

The daily coverage of current stock price developments in the media appears to have increased people’s familiarity with stock exchange issues, even among those who continue to invest exclusively in savings books, building loan contracts and life insurance policies. However, higher acceptance and the establishment of an equity culture are obviously not the key to making people invest in stocks. The broad acceptance indicated by our survey results might be traceable to the fact that respondents tend to give the answer they assume the interviewer wants to hear. In most cases, the fact that people appear to accept stocks as a means to build financial wealth has so far not been incentive enough for them to invest in stocks: only 16% of respondents claim to actually hold stocks themselves. This highlights a central finding

⁶ Stocks may e.g. be interpreted as being mutual fund shares incorporating only one asset. As bonds are also taken into consideration here, participation rates with respect to risky investments tend to be overestimated rather than underestimated.

of empirical studies in behavioral economics that analyze financial education: People may consider a certain behavior generally adequate, but may still postpone any corresponding changes in their own actual behavior (Benartzi and Thaler, 2001). Moreover, certain attitudes toward financial issues and acquired financial know-how do not automatically prompt a specific financial behavior (Schürz and Weber, 2008).

When asked why they did not hold stocks, only respondents with higher income or wealthy respondents claimed that negative risk considerations were an issue. 69% of the lowest income group stated that they simply could not afford this type of investment, while – as expected – nobody in the highest income group (with a household income of above EUR 3,000) quoted a lack of resources as the reason for not holding stocks. In general, at least in people's perception, the fact that entry costs might be too high appears to be only of little importance. This factor is hardly more important for less wealthy groups than for wealthier households.

In particular, wealthy investors who in general have more possibilities (based on their income, job security, health status, etc.) make comparably higher investments in stocks.⁷ Holders of risky assets have a higher income, a higher level of education and more financial assets. This is not surprising as, compared with other groups, they are exposed to fewer risks in other areas. Moreover, the pressure of having to sell risky assets when the stock market situation is unfavorable is lower for them, as they have additional resources of

financial wealth and income they can fall back on. Households that hold risky assets also engage in other, safe forms of saving. Almost all Austrian households claim to have a building loan contract or life insurance.

When interpreting the answers to the question “*Have you suffered price losses?*” one must bear in mind that the probability of such losses increases with the duration of the exposure and the diversification of the stock portfolio. Since a diversified stock portfolio corresponds to higher financial wealth, it is not surprising that wealthy stockholders record price losses more often. It is interesting, however, that price losses do not differ substantially in relation to stockholders' level of education or their age. Austrian stockholders perceive the ups and downs of stock prices as inevitable characteristics of stock holdings. Only a small proportion (18%) of stockholders think price losses are attributable to their own wrong investment decisions.

Insufficient portfolio diversification is often discussed in the literature. Table 1 shows that investments in the first and tenth wealth deciles in Austria differ considerably. While in the first decile, the percentage share of financial assets held in checking accounts is comparatively high and the major forms of investment are savings books, building loan contracts and life insurance policies, portfolios in the top decile are strongly diversified. While net financial assets⁸ of the first decile are, on average, negative at EUR 8,000, they are positive for the uppermost decile at EUR 287,000.

⁷ In the literature, this phenomenon is referred to as “background risks” (Cucurucu et al., 2004; Guiso and Paiella, 2001).

⁸ Net financial assets are defined as gross financial assets less consumer loans.

Table 1

Average Share of Investment Products in Gross Financial Assets

	Checking accounts	Saving plans (excluding building loan contracts)	Building loan contracts	Total of premium payments effected for life insurance	Mutual fund shares	Bonds	Stocks	Equity investments	Average net financial assets (NFA)
	%								EUR
1 st decile NFA	36.3	31.0	14.0	16.7	1.1	0.0	0.8	0.1	-8,031
5 th decile NFA	8.2	49.4	19.9	18.4	1.1	1.0	2.0	0.1	18,317
10 th decile NFA	1.3	46.4	5.9	13.1	7.1	9.3	10.9	5.8	287,003

Source: The OeNB's SFHW 2004, calculated on the basis of individual households, all households.

Increasing financial wealth goes hand in hand with a strong rise in the capital market participation rate (table 2). While in the lowest wealth decile, only 2% of households hold risky assets, the comparable figure for the highest wealth decile is 81%.⁹ In the uppermost wealth decile, the increase in participation is particularly strong.

Table 2

Breakdown of Risky Assets by Gross Financial Assets

Wealth deciles	Share of households holding risky assets
	%
Decile 1	2
Decile 2	7
Decile 3	5
Decile 4	9
Decile 5	18
Decile 6	20
Decile 7	29
Decile 8	34
Decile 9	52
Decile 10	81

Source: The OeNB's SFHW 2004.

The level of capital market participation can be analyzed with respect to a number of socioeconomic characteristics. Aside from household wealth, this study focuses on occupation, education and income (table 3).

Holdings of risky assets differ considerably across professional groups. Blue collar workers e.g. have a significantly¹⁰ lower capital market participation rate than entrepreneurs, white collar workers or civil servants. The relatively high level of stock holdings recorded for civil servants – a professional group that is thought to be rather security-oriented – indicates that income security is an important criterion for holding stocks. People who have high and secure incomes can more easily afford to be risk-oriented in their portfolio management than those with lower incomes or a higher probability of losing their jobs.¹¹ The latter group needs additional security rather than additional risk, even if they might have the same risk orientation.

⁹ These values are to be interpreted as upper limits with regard to holdings of actually risky assets.

¹⁰ In the following, significant means significant at the 5% significance level.

¹¹ The participation rate of farmers is only listed for the sake of completeness. The number of farmers in the sample is too low to support a meaningful interpretation. Moreover, the number of households listed under "Occupational status of head of household" is smaller than in the other categories, as e.g. pensioners, students or the unemployed cannot be assigned to any of the subgroups.

Table 3

Breakdown of Risky Assets by Socioeconomic Characteristics

Socioeconomic characteristics	Number of observations (per category)	Share of households holding risky assets	Deviation from share in total population
		%	Percentage points
Occupational status of head of household			
Freelance professional	69	25	-1
Entrepreneur	80	39	+13
White collar worker	747	31	+5
Civil servant	273	35	+9
Farmer	29	16	-10
Blue collar worker	235	15	-11
Educational level of head of household			
Compulsory schooling or lower	308	8	-18
Apprenticeship/vocational school, vocational middle school	1.205	21	-5
Secondary academic school, vocational or technical school	659	36	+10
Technical college/university	384	47	+21
Net household income			
up to EUR 749	116	3	-23
EUR 750 to EUR 1.349	466	9	-17
EUR 1.350 to EUR 2.249	898	21	-5
EUR 2.250 to EUR 2.999	497	36	+10
EUR 3.000 and above	579	48	+22
Total		26	

Source: The OeNB's SFHW 2004.

The participation rate of the group *compulsory schooling or lower* is significantly different from that of the group *apprenticeship/vocational school*. This group records a significantly lower participation rate than the groups *secondary academic school/vocational school* and *technical college/university*.

At the same time, higher-income households much rather participate in the stock market than lower-income households. Only the participation rates of the lowest two groups in terms of income do not differ significantly from each other. Household financial wealth, however, accounts for the biggest variations in capital market participation.

Summing up, we can say that participation in the capital market increases in line with financial wealth,

net income and the level of education. The participation rate is highest in the highest wealth decile, in the group with the highest net income, the group with the highest level of education, and with entrepreneurs.

4 Investment Behavior – An International Comparison

This section describes the group of households that hold risky assets (i.e. stocks and/or mutual fund shares and/or bonds) and the subgroup of households that hold *stocks and/or mutual fund shares*. The focus is on households that actually participate in the capital market. Of the 738 households that hold risky assets in the sample covered in the OeNB's SFHW 2004, a total of 119 households hold bonds but not hold stocks or mutual fund shares.

619 households in the sample belong to the subgroup of households that hold stocks and/or mutual fund shares.¹²

It is difficult to make international comparisons since there are hardly any microdata available and the data that do exist cover different points in time. Therefore, this study focuses on the structure of capital market participation across wealth deciles, and not on the exact level of participation rates. In the following, we will compare data for Austria with those for selected other countries from Guiso et al. (2002), which were collected in the 1990s. In general, one may assume that participation rates tend to have increased over time, especially since financial assets have also been going up markedly. Substantial decreases in participation rates in times of financial crises should affect participation at the lower end of the distribution more strongly than at the upper end, since wealthier households will find it easier to absorb shocks.

International comparison shows that Austria has a low participation rate

and that in Austria risky assets account for merely a small share in the total financial assets of those who hold risky assets. While the percentage of those holding stocks or mutual fund shares in Austria is around 22%, it is approximately 32% in the U.K., around 34% in the Netherlands and as high as around 49% in the U.S.A.¹³ The participation rates in Italy and Germany (around 19% in both countries) are comparable to the one in Austria (table 4). Differences in participation rates across countries are primarily attributable to the different pension systems. It is interesting to note that the lowest wealth deciles in most countries are characterized by similarly low participation rates; significant differences can be observed only in the upper deciles, owing in part to institutional reasons and different financial systems (market-based versus bank-based). Principally, stock markets play a more prominent role in market-based financial systems (like the U.S.A. and the United Kingdom). Germany and Austria, by contrast, belong to the

Table 4

Breakdown of Holdings of Stocks and/or Mutual Fund Shares by Gross Financial Assets

	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Top 5%	Share in total population
	%					
U.S.A.	4.4	38.3	66.0	86.7	93.7	48.9
United Kingdom	4.9	11.9	37.8	71.1	83.9	31.5
Netherlands	4.4	16.9	36.8	75.9	92.3	33.5
Germany	6.6	17.6	22.1	29.3	41.6	18.9
Italy	3.4	10.8	19.6	38.9	54.6	18.9
Austria	3.9	9.7	20.7	52.3	74.0	21.7

Source: Guiso et al. (2002, table 1.5) for the U.S.A., the U.K., the Netherlands and Germany; the OeNB's SFHW 2004 for data on Austria.

¹² 301 of these households hold only stocks, 156 hold only mutual fund shares, and 162 hold both.

¹³ For reasons of comparability, bonds are not included in this calculation. These are data from the 1990s; to be precise, they were collected in 1998 for the U.S.A., in 1997 and 1998 for the U.K., in 1997 for the Netherlands, in 1993 for Germany and in 1998 for Italy. More recent comparable data – at least for the U.S.A. and Italy – can be found in the Luxembourg Wealth Study, in which Austria also participates. In the U.S.A., the average participation rate was around 30% in 2001 (immediately after the financial crisis), and in Italy it stood at approximately 18% in 2002.

group of bank-based financial systems (for a typology of financial systems, see Levine, 2002).

Table 5 shows the average share of risky assets in the total portfolios of those households that hold the respective capital market instruments. On average, households that invest in risky assets invest slightly below one-third of their financial wealth in such assets.

Table 5

Share of Risky Assets in Gross Financial Assets¹

	Average share in financial assets
	%
Stocks and/or mutual fund shares	23
Stocks and/or mutual fund shares and/or bonds	28

Source: The OeNB's SFHW 2004.

¹ Only households holding the respective capital market instruments.

Table 6 shows the respective shares of risky assets across wealth deciles. While the total amount of households' financial assets has a strong impact on the participation rate, it hardly changes the share of risky assets in total financial assets. The share of total financial assets invested in risky assets¹⁴ is not higher among wealthy households than among less wealthy households, whereas the absolute amounts invested in risky assets increase markedly as households' financial assets go up. The phenomenon that the share of total financial assets invested in risky assets does not increase – or increases only marginally – from one wealth decile to the next can also be observed in most of the other countries under observation (Guiso et al., 2002, table 1.7).

¹⁴ The precision of the estimated shares weighted for Austria increases in the higher deciles owing to higher participation rates; in the lower deciles, it is very low. Overall, the participation rate increases across financial wealth deciles; there is no significant difference in the share of risky assets in total financial assets for those households that hold risky assets.

Table 6

Share of Risky Assets in Gross Financial Assets¹

Financial wealth deciles	Number of households in the sample that hold risky assets	Average share of risky assets in financial assets
		%
Decile 1	6	30
Decile 2	14	34
Decile 3	9	21
Decile 4	26	25
Decile 5	39	21
Decile 6	58	22
Decile 7	81	27
Decile 8	92	24
Decile 9	149	27
Decile 10	264	34

Source: The OeNB's SFHW 2004.

¹ Only households holding risky assets.

Entry costs or other fixed costs might at least partly explain the low variation in average shares of risky assets in total financial assets. In the United Kingdom, holders of risky assets have invested almost half of their assets in this investment category. While this ratio is clearly higher than in Austria, the variation between the individual wealth deciles is just as low (Banks and Tanner, 2002). Another explanation would be that investors, their financial advisors or their financial service providers follow *1/n principles* in their investment strategies. Another factor supporting this view is that standard saving instruments are used throughout all categories, including the uppermost decile – even as capital market participation rates go up. Investment in risky assets appears to be an *additional* option as financial wealth increases; it does not replace classical types of saving in the portfolio (e.g. building loan contracts or life insur-

ance policies) but has a complementary function.

5 Investment Motives and Information-Seeking Behavior

Based on the results of the OeNB's 2004 SFHW (see annex), it is possible to analyze the investment motives and information-seeking behavior of various types of households. In the following, we compare the saving motivation, information-seeking behavior, confidence in information providers and wish for government intervention of holders of risky assets and those who do not hold such assets.

When asked about their saving motivation, the share of respondents who replied that they save for retirement was significantly higher among those who hold risky assets than among those who don't. Personal pension plans are thus an issue primarily for wealthy, high-income households. This suggests that people's motivation for saving depends on how much they can actually put aside. Despite subsidized pension schemes, lower-income households seem to have much weaker incentives to save for retirement than higher-income households. Furthermore, holders of risky assets state significantly more often that they save for consumption (luxury items, vacations) than the other group. Overall, motivations for saving are also more diversified among households in the upper wealth deciles.¹⁵

Holders of risky assets obtain information significantly more often and rely on a larger number of information sources than those who invest in safe assets only. The information-seeking behavior of the two groups differs

mostly in their consultation of the Internet, newspapers and independent financial advisors. Holders of risky assets are ready to pay a higher price for obtaining information, which may be related to the fact that making investments is more important for them than for households that do not hold risky assets, and that they are therefore willing to deal with the topic more comprehensively. The fact that they can also make higher profits because they have more money to invest, however, justifies the higher cost of obtaining comprehensive information. Households that do not hold risky assets obviously tend to rely more on advice by their banks than on comparing information obtained from various sources. In Austria, bank customers – who typically keep close relations with their banks (house bank principle) – often obtain cost-free stock investment advice from their respective bank. However, free investment advice involves a conflict of interest between customers, who wish to obtain objective information, and financial advisors, who wish to sell specific products. Lower-income customers are much more affected by this incentive problem than wealthy customers.

One question in the OeNB SFHW addresses the state-subsidized personal pension scheme in place in Austria. Based on the answers to this question, we can compare how much potential investors know about this investment possibility. In this respect, no significant difference was found between holders of risky assets and those who do not hold such assets: Even though the scheme was highly advertised, one-third of respondents was unable to

¹⁵ The possibility of multiple responses is accounted for in the calculation of significance levels.

identify the fundamental difference between interest rate and premium.¹⁶

The survey respondents were also asked how much confidence they had in the various institutions that provide financial information. The share of respondents who said they trusted financial service providers (banks, insurance companies, etc.) and the OeNB is significantly higher among holders of risky assets than among the other group. Both groups considered the Austrian consumer affairs organization (Verein für Konsumenteninformation) to be the most reliable information provider.

The question addressing legal provisions that improve the comparability of financial products yielded especially noteworthy results: While the majority of both groups would welcome such government intervention, agreement was significantly higher among those who do not hold risky assets (81%) than among those who do (74%). This points to considerable uncertainty in the face of a confusingly broad range of financial products (Fessler et al., 2007; Schürz and Weber, 2008).

The OeNB's 2004 SFHW does not include a lottery question, which usually serves to measure risk aversion.¹⁷ Instead, survey respondents were asked to rate the following statement: "*When I invest, high profit is more important to me than high security.*" Possible answers were "completely applicable," "rather applicable," "inapplicable" or "completely inapplicable." While 17% of respondents voiced agreement, the overwhelming majority replied that the statement was

inapplicable or completely inapplicable (74% among holders of risky assets, 84% among the other group). This result provides some indication of respondents' level of risk aversion – those who agreed to the statement would probably consider themselves risk-oriented. The validity of this self-assessment, however, seems doubtful, as the question is based on the disputable stereotype of a dichotomy between rather risk-oriented and rather risk-averse persons. Investment security is a key issue for everyone who makes investment decisions. Almost all households opt for safe assets, and only those who are very wealthy additionally invest in risky assets.

6 Logit Estimation

In the following, we calculate a logit model to estimate the probability of holding *stocks and/or mutual fund shares*.¹⁸ We aim at identifying the determinants for holding stocks and/or mutual fund shares and at assessing their relative importance. In addition, the model controls whether or not variations in capital market participation that are associated with factors such as income, education level and financial wealth are correlated with each other and/or other control variables. The log of gross financial assets, a dummy variable vector for household income and a dummy variable vector for the education level were included as independent variables.¹⁹ The respective mode is used as the reference class.

¹⁶ The wording of the question was such that yes would have been the correct answer, and the anchoring bias phenomenon may be expected to lead to upward rather than downward distortion.

¹⁷ Banca d'Italia's Survey on Household Income and Wealth, for example, features a question on how much money respondents would pay for a 50% chance of a LIT 10 million lottery prize.

¹⁸ Bonds are not included here because (1) it is disputed whether or not they actually belong to the category of risky assets and (2) bond holdings possibly follow different patterns than stock and mutual fund holdings. Anyway, the results for Austria hardly change if bond holdings are included.

¹⁹ Beer et al. (2006) use a similar methodological approach. The information on education levels refers to heads of households.

Including age and the squares and cubes of the household head's age²⁰ allows us to examine possible nonlinear effects of age on the decision to participate in the capital market. Nonlinear effects are taken into account for three reasons: First, the investment horizon of younger households is markedly longer than that of older households. Second, home purchases are usually made in prime age and followed by a period in which the probability of holding risky assets should be relatively low (repayment of home loans). Third, the capital market participation rate of older households should be rather low according to the life cycle hypothesis. In addition, this age cohort possibly never considered capital market participation as an option, given that the Austrian stock market was less developed when these households took long-term investment decisions. Further control variables are a dummy variable for home-owning households, for (married) couple households, for Vienna-based households and for risk aversion related to investments.

Table 7 presents the estimation results including odds ratios with corresponding standard errors, marginal effects as well as other information on estimation diagnostics.²¹

The estimation results can be interpreted in terms of odds ratios or marginal effects. Odds ratios measure the expected effect of explanatory variables. They refer to unit changes of the independent variables. In our case, they refer to the corresponding odds of holding stocks and/or mutual fund shares,

with a value above 1 indicating a rise in probability. When interpreting odds ratios, it is important to distinguish between continuous and dummy variables. Odds ratios for dummy variables – unlike those for continuous variables (such as the log of gross financial assets or age) – refer to a change in the respective variable from 0 to 1 and thus to group membership. For instance, belonging to the group *academic secondary school/higher-level technical and vocational school* increases the odds of holding stocks and/or mutual fund shares by a factor of around 1.6 relative to the group *apprenticeship/vocational school/medium-level technical and vocational school*.

Marginal effects indicate the absolute change in the estimated probability of holding *stocks and/or mutual fund shares* conditional on a marginal change in the independent variables, and are evaluated at the means or modes, respectively. If we use the mean, respectively the mode, for all variables included in the model, the probability of holding *stocks and/or mutual fund shares* comes to around 0.08. The results for marginal effects, like those for odds ratios, reflect the dominant role of households' financial wealth. A higher marginal effect was observed only for the *risk aversion* dummy variable. In comparing marginal effects, we must consider that marginal effects for dummy variables refer to the total possible change from 0 to 1. For the (continuous) financial wealth variable, by contrast, a marginal change in the mean leads to an increase by almost 9 per-

²⁰ In the OeNB survey, the household head is either the household member identified as such by the interview partner or the one with the most accurate knowledge about the respective household's finances.

²¹ In addition to the information on estimation diagnostics presented here (pseudo R^2 , ROC), we also used other assessment criteria, e.g. the Hosmer Lemeshow test, Nagelkerke's R^2 , McFadden's R^2 , Cox and Snell's R^2 as well as classification accuracy. All these criteria produced satisfactory results, but the literature is fundamentally divided as to the various R^2 measures.

Table 7

Holdings of Stocks and/or Mutual Fund Shares – Logit Estimate

	Odds ratio	Standard error	Marginal effect ¹ P(Y X) = 0.083
Gross financial assets (log)	3.175***	0.216	0.088***
Age			
Age	0.732***	0.087	-0.024**
Squares of age	1.005**	0.002	0.000**
Cubes of age	0.999*	0.000	-0.000*
Dummy variables			
Household income (excluding EUR 1,350 to EUR 2,249)			
up to EUR 749	0.423	0.282	-0.046*
EUR 750 to EUR 1.349	1.080	0.232	0.006
EUR 2.250 to EUR 2.999	1.514***	0.240	0.037**
EUR 3.000 and above	1.738***	0.280	0.053***
Education (excluding apprenticeship, vocational school, medium-level technical and vocational school)			
Compulsory schooling or lower	0.717	0.184	-0.022
Academic secondary school, higher-level technical and vocational school	1.580***	0.214	0.042***
Technical college, university	1.626***	0.261	0.045**
Risk-averse households	0.366***	0.052	-0.115***
Home-owning households	1.399**	0.190	0.022**
(Married) couple households	0.765*	0.115	-0.023*
Vienna-based households	1.426***	0.192	0.031**
Number of interviews	2,556		
Pseudo R ²	0.29		
Area below the receiver operating characteristics (ROC) curve	0.85		

Source: Authors' calculations based on the OeNB's 2004 SFHW.

¹ Evaluated at the mean (continuous variables) or mode (dummy variables); marginal effects for dummy variables refer to a change from 0 to 1.

Note: ***, **, * means significant at the 1%, 5% and 10% significance level.

centage points in the predicted probability of holding *stocks and/or mutual fund shares*.²²

The probability of a household owning *stocks and/or mutual fund shares* rises significantly with its gross financial wealth, income and education level. Moreover, it is higher for home-owning or Vienna-based households but lower for (married) couple households. The risk aversion dummy – capturing those respondents who disagree with the statement “*When I invest, high profit is more important to me than high security*” – is significantly negative in the

model, as expected. Gross financial assets have by far the highest explanatory power, though.

A joint assessment of all three age variables highlights the influence of age on the probability of holding *stocks and/or mutual fund shares*. We can show that this probability declines until the age of around 40, remains relatively constant after that and drops again sharply at retirement age. This means that, ceteris paribus, the probability of holding stocks is higher for relatively low-aged households. The age factor is, however, hardly relevant in countries in which

²² Using the means, respectively the modes, of all other variables and the 10th, 25th, 50th, 75th and 90th percentiles for gross financial assets produces the following probabilities of holding *stocks and/or mutual fund shares*: 10th percentile: 0.011; 25th percentile: 0.034; 50th percentile: 0.083; 75th percentile: 0.215; 90th percentile: 0.394.

capital market participation is traditionally high. This might point to a future increase in Austrians' capital market participation, as younger people are more concerned about their public pension income than older people.

Our results are consistent with those reported by Haliassos and Bertaut (1995), who estimate a similar logit model for the U.S.A. and also find that financial wealth, income and education level have a positive influence on capital market participation. Their data set is superior in that it allows the authors to directly include unemployment risk in the model, whereas in our case, it was only possible to use the income and education dummy variables as imperfect proxies.

7 Conclusions

Stocks are not widely spread in Austria, and stock holdings are concentrated among wealthy, high-income households. This finding from the OeNB's 2004 Survey on Financial Household Wealth (SFHW) ties in with available international data.

The share of risky assets in total financial assets is not a suitable indicator of households' risk aversion. Less wealthy households, which – in terms of financial wealth, income, job security, health, etc. – typically face higher risks and dangers than wealthier households, mainly hold safe, low-return assets so as to minimize risk at least in their investment portfolios. This does not imply that they are generally more risk-averse than wealthy households.

While wealthier households also hold safe assets, their willingness to complement their portfolios with risky assets increases in line with their financial assets. At around one-third, the average share of financial assets that households holding risky assets have invested in risky assets is rather low in Austria, and it hardly changes with rising income or financial wealth.

Assuming the same level of risk aversion and assuming that the risk of unemployment or illness decreases as financial wealth increases, wealthier households should opt for riskier investments than less wealthy households. However, the collected data do not confirm this assumption, indicating that the share of risky assets tends to be disproportionately low in the portfolios of wealthy households. This hypothesis is confirmed by the fact that even households in the top decile of gross financial wealth invest in building loan or life insurance contracts.

There seem to be two main reasons for Austrians' low stock holdings: the well-functioning public pension and health care systems on the one hand and the limited saving capacity of some households on the other. To date, the pay-as-you-go pension system still provides a certain level of income security that many Austrian households consider adequate. Hence, they do not believe it is necessary (yet) to make riskier investments. This perception seems to be changing, especially among younger households, which might lead to higher capital market participation in Austria.

Annex

The OeNB's 2004 Survey on Financial Household Wealth (SFHW) – Selected Questions

1. *What is your motivation for saving up money?*
 - Saving for retirement
 - My family's financial security
 - Major purchases (house, car, flat, etc.)
 - Medical expenses (dentist, operations, etc.)
 - Saving up money in case I lose my job
 - Nothing particular – just for a rainy day
 - Other, i.e.:

2. *Which sources do you rely on when you seek information on financial issues?*
 - I talk to my financial advisor at my bank.
 - I get brochures at my bank.
 - I gather information at different banks.
 - I talk to independent financial advisors.
 - I talk to my family.
 - I talk to friends.
 - I talk to my colleagues at work.
 - I consult with the staff council at my workplace.
 - I browse the internet for information.
 - I rely on information from newspapers.

3. *Which of the following do you regard as the most reliable information source on financial issues?*
 - Federal government/parliament
 - Oesterreichische Nationalbank (OeNB)
 - Austrian Chamber of Labour
 - Austrian Federal Economic Chamber
 - Financial service providers (banks, insurance companies, etc.)
 - Schools, universities, other providers of higher education
 - Other training institutions (adult education providers, etc.)
 - Employer
 - Austrian consumer affairs organization (Verein für Konsumenteninformation)

4. *Would you welcome legal regulations promoting increased comparability of financial products?*
 - Yes
 - No

5. *Have you suffered price losses so far?*
 - Yes
 - No

6. *What were the reasons for the price losses?*
 - Insufficient knowledge
 - Beginner's mistakes

- Natural stock exchange developments
- Other, i.e.:

7. *Why don't you have any shares?*

- Too risky in comparison with other investment forms
- On the basis of advice I got at my bank
- Costs/fees too high
- On the basis of advice I got from friends
- Lack of advice/insufficient knowledge
- I can't afford it
- Other, i.e.:

References

- Ameriks, J. and S. Zeldes. 2004.** How do Household Portfolios Shares Vary with Age?
- Banca d'Italia. 2008.** The Bibliography of the SHIW. www.bancaditalia.it/statistiche/indcamp/bilfait/biblio/biblio_ing_2.pdf
- Banks, J. and S. Tanner. 2002.** Household Portfolios in the United Kingdom. In: Guiso, L., M. Haliassos and T. Jappelli (eds.). *Household Portfolios*. The MIT Press. 219–251.
- Beer, C., P. Mooslechner, M. Schürz and K. Wagner. 2006.** Austrian Households' Financial Wealth: An Analysis Based on Microeconomic Data. In: *Monetary Policy & the Economy Q2/06*. OeNB. 94–110.
- Benartzi, S. and R. Thaler. 2001.** Naive Diversification Strategies in Defined Contribution Saving Plans. In: *The American Economic Review* 91. 79–98.
- Bertaut, C. and M. Starr-McCluer. 2002.** Household Portfolios in the United States. In: Guiso, L., M. Haliassos and T. Jappelli (eds.). *Household Portfolios*. The MIT Press. 181–219.
- Bonß, W. 1995.** *Vom Risiko. Unsicherheit und Ungewissheit in der Moderne*. Hamburg.
- Brandolini, A., E. Sierminska and T. M. Smeeding. 2006.** Comparing Wealth Distribution Across Rich Countries: First Results from the Luxembourg Wealth Study. Working Paper 1. Luxembourg Wealth Study.
- Campbell, J. Y. 2006.** Household Finance. In: *Journal of Finance* LXI(4). 1553–1603.
- Cronqvist, H. and R. H. Thaler. 2004.** Design Choices in Privatized Social-Security Systems: Learning from the Swedish Experience. In: *The American Economic Review* 94(2). May. 424–428.
- Cucurucu, S., J. Heaton, D. Lucas and D. Moore. 2004.** Heterogeneity and Portfolio Choice: Theory and Evidence. Prepared for the Handbook of Financial Econometrics.
- Deutsche Bundesbank. 1997.** Die Aktie als Finanzierungs- und Anlageinstrument. In: *Monthly Report*. January.
- Fano, D. 2005.** Assessing Risk in Household Portfolios: Progress and Open Issues at the Macro and Micro/Survey Level. Luxembourg Wealth Study. S.A.DI.BA. Perugia. January. 17–29.
- Farny, O. 2007.** Förderung der Vermögenden. In: *Mitbestimmung* 3/2007. 27–29.
- Fessler, P., M. Schürz, K. Wagner and B. Weber. 2007.** Financial Capability of Austrian Households. In: *Monetary Policy & the Economy Q3/07*. OeNB. 50–67.
- Gollier, C. 2002.** What Does Theory Have to Say About Household Portfolios? In: Guiso, L., M. Haliassos and T. Jappelli (eds.). *Household Portfolios*. The MIT Press. 27–55.
- Guiso, L. and M. Paiella. 2001.** Risk Aversion, Wealth and Background Risk. CEPR Discussion Paper 2728.
- Guiso, L., M. Haliassos and T. Jappelli. 2002.** *Household Portfolios*. The MIT Press.

- Guiso, L. and T. Jappelli. 2002.** Household Portfolios in Italy. In: Guiso, L., M. Haliassos and T. Jappelli (eds.). *Household Portfolios*. The MIT Press. 251–291.
- Guiso, L., M. Haliassos and T. Jappelli. 2003.** Household Stockholding in Europe: Where Do We Stand, And Where Do We Go? CEPR Discussion Paper 3694.
- Guiso, L., L. Sapienza and L. Zingales. 2005.** Trust in the Stock Market.
- Hacker, J. S. 2007.** *The Great Risk Shift*. Oxford University Press.
- Hahn, F. 2002.** Bedeutung von Aktienmärkten für Wachstum und Wachstumsschwankungen in den OECD-Ländern. Annex to: Zotter, T. *Materialien zu Wirtschaft und Gesellschaft* 79. Vienna Chamber of Labour.
- Haliassos, M. and C. Bertaut. 1995.** Why Do so Few Hold Stocks? In: *The Economic Journal* 105(432). September: 1110–1129.
- Haliassos, M. 2006.** Household Portfolios. In: *Palgrave Dictionary*. 2nd edition.
- Honohan, P. 2006.** Household Financial Assets in the Process of Development. In: *World Bank Policy Research Working Paper* 39365.
- King, M. and J. Leape. 1987.** Asset Accumulation, Information and the Life Cycle. NBER Working Paper 2392.
- Lacina, F. 2008.** Das Spiel auf dem Börsenparkett. Discussion with W. Kretschmer. In: *Bank exklusiv* 1/2008. 8–9.
- Levine, R. 2002.** Bank-Based or Market-Based Financial Systems: Which is Better? William Davidson Working Paper 442. University of Minnesota.
- Mooslechner, P. 2003.** Finance for Growth, Finance and Growth, Finance or Growth? Three Perspectives on the Interaction of Financial Markets and the Real Economy. In: *Focus on Austria* 1/2003. OeNB. 76–94.
- Schenz, R. 2003.** Die Sanktion ist der Markt. Interview published in *voestalpine Magazin*.
- Schuberth, H. and M. Schürz (eds.). 2003.** Finance for Growth. In: *Focus on Austria* 1/2003. Special issue. OeNB. www.oenb.at/en/img/foa_20031_tcm16-8299.pdf
- Schürz, M. 2008.** Auf der Suche nach dem verschwiegenen Reichtum. In: *Intervention* 5(1). 62–74.
- Schürz, M. and B. Weber. 2008.** *Das Wissen vom Geld. Auf dem Weg zum Finanzbildungsbürgertum*. Graz: Nausner & Nausner.