Financial Innovation and Stock Market Participation*

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Abstract

This paper analyzes the development of retail structured products, an innovative class of complex financial instruments with option-like features, on a large administrative panel of Swedish households. We document the emergence of this asset class and its impact on household financial decisions. We report that investors in structured products face different socioeconomic circumstances than investors in traditional assets such as stocks and equity funds. The micro-evidence in this paper suggests that the introduction of retail structured products increases stock market participation. The effect is larger for relatively poor households and households that initially have a low risky share.

JEL classification: I22, G1, D18, D12.

Keywords: Financial innovation, household finance, structured products, stock market participation.

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1 Introduction

One of the major challenges of household finance is the low level of stock market participation in developed economies. This low level of stock market participation has large potential economic effects, as savings are directed towards sovereign bonds or real estate, hence potentially limiting financing access of firms. Financial innovation, by allowing a better customization of financial products, might alleviate the frictions that hinder household to invest in stock market. For instance, products offering a guarantee in capital at maturity might encourage loss-averse investors to participate. This study aims at addressing this question by using unprecedented detailed data on the demand and supply side of an innovative asset class that gives exposure to stock markets: the retail market for structured products.

Retail structured products include any investment products marketed to retail investors that possess a payoff defined ex ante by a formula over a given underlying financial asset. For example, a typical product offers the following cash flows: investor pays 100 initially, and gets 100 times (1 + half of the positive performance of the OMX 30 over the period) at maturity, up to a maximum of 150.

In a well-functioning market, structured products may yield considerable benefits for retail investors, offering the opportunity to diversify risk and payoffs.[1] Hence, structured products allow retail investors to buy or sell options, often on long maturity, which in practice is often difficult or costly for retail investors. These options potentially allow tailoring investors' risk exposure to their specific preferences and therefore may increase households' appetite to participate to stock markets, as in the theoretical model of Calvet et al. (2004). Does the development of an innovative market of financial products, which allow customization of stock market exposure, improve stock market participation for households?

[1] Célérier and Vallée (2016) describe how banks use structured product complexity to cater to yield seeking investors. This current study takes a different view and explore a potential benefit of the retail market for structured products.

This study relies on Swedish micro data with detailed information on both household characteristics and financial holdings (see Calvet et al. (2007)), merged with a unique European dataset with detailed information on all structured products sold in Europe since market inception (see Célérier and Vallée (2016)).

This setting offers a unique opportunity to study how the introduction and the development of a financial innovation can impact retail investors portfolio decisions. The combined data is unprecedented in many dimensions. First, the detailed description of each structured product enables us to relate product-specific design to household characteristics. Second, the Swedish individual data allows us to build precise proxies for investor sophistication and risk aversion, with variables such as disposable income, stock market experience, family status, years of schooling and education background.[2] Third, the Swedish market for structured products is highly innovative and is considered the most diverse market in terms of underlying assets in Europe, providing retail investors with a broad choice of investment opportunities. Sweden is the largest Nordic financial market (with USD 560bn in market capitalization), as well as the largest retail market for retail structured products, and the 9th largest European market in terms of assets under management (USD 22bn in 2010).

Our results are supportive of the view that financial innovation enhances household stock market participation, especially among certain demographics. We first document that participation to this new market is massive, with 11% of all households having bought at least one of these products. In the cross-section, structured product participants are relatively wealthier, less educated, older, more likely to be women and initially own a lower risky share than participants in other categories of equity-linked products. Characteristics that predict structured product participation appear not to be necessarily the same as those that predict equity funds and direct stock ownership. Second, we find that a large share of new participants to stock markets do it through structured products: 20% of the new stock market participants in 2007 start participating using these instruments. Third, the substitution effect between structured products and other stock market products is

[2]These variables will be complemented by psychological ability, IQ scores and high school grades.

mild, only 30%. When a household invests one percent of its financial wealth in retail structured products in a given year, it only reduces its other equity investments by 0.3% on average, which therefore leads to an aggregate increase of 0.7% of its stock market exposure. The increase in stock market exposure due to household participation in the market for structured products is larger for relatively poor households, and households with an initially low risky share. Finally, product design differs according to the demographic characteristics of the households. New participants invest in products with a relatively high level of capital protection. Taken altogether, these results suggest that retail structured products respond to consumer needs among certain subgroups of the population.

The paper is organized as follows. Section 2 presents the household and asset data. Section 3 documents the growth of the structured product market in Sweden and the characteristics of households owning these complex assets. In Section 4, we show that development of structured products tends to increase participation in risky asset markets, especially for risk-averse households. Section 5 concludes.

2 Data

The study relies on two main datasets: one covering detailed information on individual portfolios at the asset level for the whole Swedish population, the other one comprising detailed information on structured products issuance in Sweden and other European countries. Both datasets are cleanly matched through unique International Security Identification Number (ISIN).

The first dataset, described in Calvet et al. (2007), consists in panel data of financial wealth and income covering all Swedish households over the period 2000 to 2007. This dataset has been used to study household portfolio diversification (Calvet et al. (2007)), rebalancing behavior (Calvet et al. (2009)), financial risk taking (Calvet and Sodini (2014)) and value investing (Betermier et al. (2014)). This data is available because the Swedish government levied a wealth tax during the period 2000-2007. To collect this tax, the government assembles records of financial assets. The records break down to the individual

security level and are based on statements from financial institutions that are verified by taxpayers. In addition, the data contains a high diversity of individual socio-demographic and financial characteristics, in addition to a number of proxies for sophistication, such as education level and subject.

The second dataset, which is developed in Célérier and Vallée (2016), contains detailed information on all the retail structured products that have been sold in Europe since 2002. A comprehensive pay-off description, information on distributors, and volume sold are available at the issuance level. The database also includes measures of complexity for each product, obtained through a text analysis of the pay-off description (see Célérier and Vallée (2016) for the precise methodology).

The dataset resulting from merging the two previous sources represent an ideal setting to investigate how the development of structured products affected household investment decisions, as the overlap of the datasets occurs during the high growth period of the retail market for structured products.

Due to computational constraint, we conduct our empirical analyses on a subsample drawn randomly from the whole population. This subsample contains 300,000 households, or slightly more than 5 percent of the Swedish population, at the end of 2000. From the initial set of households, we keep the ones that are comprises individuals older than 25 years old, who have a strictly positive disposable income and hold more than $1,000$ Kronor of financial wealth. These restrictions leave us with 280,000 households.

3 The Development of a Financial Innovation

3.1 The Emergence of a New Asset Class in Sweden

The retail market for structured products emerged in Sweden in 2000 and has subsequently experienced steady growth. Figure I shows that both volumes sold and the number of products issued have quickly increased from 2002 to 2007.

INSERT FIGURE I

In 2007, with more than 8 billion dollars (2000 real dollars) of outstanding volumes, Sweden is the largest Nordic retail market for retail structured products, and the 9th largest European market. Volumes invested in structured products in 2007 represent nearly 3.5% of all Swedish financial savings, which compares to 22% for mutual funds.

Figure II shows the evolution of the percentage of stock market participants who hold structured products over the 2002-2007 period. The share is dramatically increasing from 2000 to 2007 and reaches 17% in 2007. Therefore, the market has grown both in volumes and in the number of investors.

INSERT FIGURE II

While the market is concentrated, with the market share of the four largest distributors (Swedbank, Handelsbanken, Nordea and SEB) covering more than 80% of the market in terms of volumes sold, the number of distributors has also been constantly increasing over the period 2002-2007, to reach 23 distributors in 2007 (see Figure III).

INSERT FIGURE III

INSERT TABLE I

3.2 Main Characteristics of Swedish Structured Products

Our sample includes 1,939 structured products that have been issued in Sweden over the 2002-2007 period, for a total volume of 9.4 billion dollars. Table II reports summary statistics of their main characteristics.

INSERT TABLE II

Almost all products have a structured bond format (98% of issuances), and therefore bear credit risk. This format can be pensionable through IPS status eligibility, and the average term is 3.5 years.

In terms of underlying asset, the market exhibits a strong preference for equity-linked products (87% of the products) via single equity indices or shares (44%), or basket of indices

(32%). With 72% of these products being based on non local-indices, i.e. neither Swedish stocks or indices, nor European indices, Sweden seems less prone to the traditional local bias evidenced in many European countries. Additionally, asset classes such as commodities (8%), exchange rates (4%) and hedge funds (2%) are also popular exposures. More than half of the products have more than one underlying asset, 23% of the products have at least 5 underlyings. Overall, the Swedish market for structured products exhibit a high diversity in terms of underlying assets.

In terms of payoff formula, "capital-protected" products are overwhelmingly dominant. Hence, 98% of the products issued over the period are capital protected. However, it is common practice in Sweden, as in other Nordic countries, to designate a product as "capital-protected," even though the issue price is higher than 100%. The guarantee is therefore given on a lower amount than the one initially invested. This is the case for 55% of the products. Hence the average issue price amounts to 105.1% of the guarantee, with a maximum of 120%.

88% of the products provide a linear participation in the rise of the underlying asset (call feature), with the following additional payoff features being also popular: averaging or asian options (63%), best of option (13%), cap (6%), rainbow (4%), podium (4%), worst of option (1.2%) etc.

Product minimum return, which we compute as the ratio of the capital guarantee at maturity to the sum of the issue price plus the entry fees, ranges between 78.8% up to 122% with an average of 93.9%.[3] Figure IV plots the histogram of the minimum return on the left-hand side, and the participation rate in the growth of the underlying as a function of the minimum return for the sample of products indexed to a European index on the right-hand side. Banks offer a lower minimum return when increasing the participation rate in the growth of the underlying.

INSERT FIGURE IV

[3]This calculation ignores credit risk.

Below are the descriptions of the three products that collected the highest volumes over the 2002-2007 period.[4] These three *blogblusters* are broadly representative of the Swedish market. The average term is three years. These three products are presented in order of increasing creativity in terms of underlying (respectively DJ Eurstoxx 50, a Chinese index, and a basket of exchange rates), and decreasing complexity in terms of payoff formula (from a digital with a reverse cliquet feature, to a call plus a cap and an initial fee, to a standard call). These three examples suggest a substitutability between underlying asset sophistication and the complexity of the payoff formula.

- The first product, named *Spax Framtid 486* has been distributed by Swedbank in 2007 and collected 282 million dollars. Like most of the Swedish structured products, capital is guaranteed, and like 38% of the products, the underlying is a single index. The main feature of the product is a digital, coupled with a reverse cliquet feature, which corresponds to the third most popular type of payoff over the period.

  > *This is a growth product linked to the performance of Dj Eurostoxx50 index. The performance of the index is observed over every month. At the end of the investment period the negative monthly returns are deducted from the maximum total return of 140%. At maturity the product offers a minimum capital return of 111.25%. The product is issued at par, and a fee of 1.5% is added to the issue price.*

- The second product, named *Aktieobligation 710* has been distributed by SEB in 2007 and collected 60 million (2000) dollars. Capital is guaranteed, and the underlying is again a single index, the Hang Seng China enterprises, which is rather an exotic index for a Swedish average investor. The main feature of the product is a call, coupled with an averaging. On top of that, the products is offered at a rather high price.

  > *This is a growth product linked to the performance of Hang Seng China enterprises index. At maturity the product offers a minimum capital return*

[4] Prospectuses are in the online appendix.

of 100% plus 100% of the rise in the index over the investment period. The initial basket level is calculated as an average of six daily readings in the beginning of the investment period and the final basket level is calculated as an average of 13 monthly readings during the last year of the investment period. The product is issued at 112%.

- The third product, named *Tillvaxtmarknader Valuta* has been distributed by Acta, and collected 50 million (2000) dollars.

  The performance of the product is linked to an equally weighted currency basket consisting of three currency exchange rates (cny/usd, idr/usd, inr/usd). At maturity the product offers a minimum of 100% capital return plus 265% participation in the rise of the underlying over the investment period. The product is issued at 100%. There is a 4% entry fee.

3.3 Structured Product Participants

In Table III, we report summary statistics for both household portfolios and other household characteristics for the samples of structured product participants, stock market participants and overall population. A household is viewed as a participant in stock markets, respectively structured products, if it possesses a strictly positive amount of investment in the stock market, respectively in structured product. With this definition, 61 percent of Swedish households were stock market participants at the end of 2007, and 11 percent were structured product participants.

These summary statistics points at structured products participants being wealthier than both the overall population and the stock market participants, but also significantly older, and less invested in stock markets than traditional participants.

INSERT TABLE III

To further explore the determinants of structured product participation, we implement logit regressions on being investor in structured products at any time during the 2002-

2007 period. We use household characteristics in 2002 as explanatory variables. Table IV displays the regression coefficients. For comparison purpose, we run the same regressions on being investor in stocks, and in equity mutual funds.

INSERT TABLE IV

This analysis shows that the following characteristics are associated with a higher propensity to invest in structured products: being wealthier, being older, and being a woman. These characteristics are interesting to contrast with the ones driving investment in the other equity products. Age and gender indeed have opposite effects for participation in stocks. While years of schooling is a positive predictor of investment in stocks and mutual funds, it does not have explanatory value for investing in structured products. The coefficient of "risky share" is also significantly lower, suggesting that participants in structured products hold initially a low share of financial wealth in risky assets, relatively to participants in other asset classes.

We also investigate the geographic variation in terms of penetration. Figure V displays for each Swedish province the share of household that invest in structured products during our sample period. The higher level of penetration appear to be in some rural provinces, and not in Stockholm or Goteborg, the largest cities.

INSERT FIGURE V

4 Effect on Stock Market Participation

In this section, we provide a set of results supporting the view that the development of structured products increases household stock market participation. The effect appears to be larger for households that are likely to present a higher risk aversion.

4.1 New Stock-Market Participants

We restrict our analysis to households that are not participating in stock markets in 2002, before the development of the structured product market.

We define new participants as households that were not participating in stock markets during the four years before 2002 and that start investing in a product linked to equity during the 2003-2007 period. Figure VI shows the evolution of the share of total households that start participating to stock markets through standard equity investment products (equity funds, allocation funds, etc.), and through structured products only. We observe that the number of new stock market participants is increasing over the period, and that structured products are significantly contributing to this dynamic. While new participants through structured products only represent 3.6% of new participants through traditional products in 2002, this proportion reaches 17% in 2007.

INSERT FIGURE VI

As Figure VII shows, age is positively correlated with household likelihood to start participating through structured products. Figure VII displays the share of 2002 non participants who have started participating in stock markets through structured products and the share of 2002 non participants who have started participating in stock markets through other equity-linked products over the 2002-2007 period, and across age categories.

INSERT FIGURE VII

The next step of our empirical analysis is to explore the characteristics of the households that become new participants through structured products. We run the following logit regression on a household becoming invested in stock markets through structured products in the 2003-2007 period:

$$SPparticipant_{i,t} = \alpha + \beta \times HouseholdCharacteristics + \epsilon_i$$

where the dependent variable $SPparticipant$ is a dummy variable equal to 1 in case of a new participant participating through structured products. For comparison purpose, we conduct the same regressions on starting participating to stock market through classic instrument (stocks and equity mutual funds).

Table V displays the results of these estimations. Consistent with the results from Table IV, we observe that households that are gaining equity exposure through structured products are more likely to be wealthier, female, and older.

INSERT TABLE V

4.2 Effect on Household Equity Exposure

We now explore whether investing in structured products leads to an increase in total stock market exposure, including for households already participating to stock markets.

Figure C.1 in the appendix plots the total volumes invested in equity-liked products, breaking down the amount invested into account structured products. We observe that structured products represent an increasing share of total volumes invested in stock markets over the 2002-2007.

In order to observe the effects of participation in structured products on stock market exposure, we restrict our analysis to stock market participants in 2002. Figure VIII plots the 2002-2007 evolution in stock market exposure for 2002 stock market participant who have invested in structured products and for those who have not. Structured product participants have significantly increased their participation in stock markets, more than non-structured product participants, and the effect is decreasing with wealth. Hence, stock market participants in the first quintile of wealth have increased stock market exposure by more than 15% if they have invested in structured products, versus -2% if they have not.

INSERT FIGURE VIII

Figure VIII plots the 2002-2007 evolution in stock market exposure for 2002 stock market participant who have invested in structured products and for those who have not across quintiles in risky share. We observe that the positive effect of participation in structured products on stock market exposure is larger for households with initially a low level of risky share. These households are more likely to be risk averse.

INSERT FIGURE IX

We investigate further the effect of structured product participation on stock market exposure by estimating the substitution rate between structured products and other equity investment products. We run the following regression in a panel model:

$$stockmarketshare_{i,t} = \alpha + \beta \times SPshare_{i,t} + \gamma \times I_i + \eta \times Y_t + \epsilon_{i,t}$$

where *stockmarketshare* is the share of financial wealth invested in products indexed to equity without including structured products, $SPshare$ is the share of financial wealth invested in **structured products** indexed to equity, I_i are individual fixed effects and Y_t are year fixed effects.

Table VI reports the results. The coefficient of the variable $SPshare$ in column 1 shows that there is only a modest substitution effect between structured products and other equity products (28%), meaning that 72% of the amount invested in structured products comes as an increase in the volume invested in stock markets. The larger share of this substitution comes from equity mutual funds. On the other hand, substitution with cash is large.

We then test whether the substitution effect varies according to households characteristics. To do so, in columns 2 to 6, we add interactions between the share invested in structured products and our main explanatory variables. We find that despite their stronger financial constraint, the substitution effect is significantly lower for households with a lower financial wealth (column 2) and with a lower risky share (column 3).

In column 7 of Table VI, we focus on substitution effects for equity funds. This relatively large effect is consistent with what we observe in Figure C.1 in Appendix. The figure draws the evolution of the share of each asset class in financial wealth. However, column 8 shows that the majority of the purchase of structured products is funded with cash, and not through the rebalancing within the risky share of financial wealth.

INSERT TABLE VI

4.3 Structured Product Design and Household Characteristics

We now analyse the relationship between structured product design and household characteristics.

We estimate the following model for the sample of households investing in at least one structured product in 2007.

$$Productcharacteristics_{p,i} = \alpha + \beta \times Education_i + \sum_{j=1}^{5} \gamma_j FinancialWealth + \sum_{j=1}^{5} \eta_j RealestateWealth + \sum_{j=1}^{5} \theta_j Income + \sum_{j=1}^{5} \lambda_j Leverage + \phi Demographics_i + \epsilon_i$$

where *productcharacteristics* are: the minimum return that the product offers, the issuance price of the product, the participation rate in the growth of the underlying, a dummy variable equal to one if the product is defined as "simple", i.e. with only one single index as underlying and two or less features in the payoff formula, the type of underlying (categories ranks from 1 to 4: simple domestic index, simple exotic index, basket of indices or shares, hybrid underlying, including commodities) and the number of underlying assets. The variable *education* is the log of the number of years of education of the household head. The other control variables include demographic characteristics and quintiles of income, leverage, financial wealth, real estate properties.

The estimates in Table VIII show that households with lower disposable income, lower financial wealth, lower years of schooling, higher age and most importantly, new stock market participants, invest in products offering a higher minimum return (column 1), a lower issue price (column 2), a lower participation rate to the underlying (column 3) - products offering a high participation rate in the underlying at a higher price are more likely to cater to yield-seeking investors than to risk averse investors -. These households are also significantly more likely to invest in the most basic products (column 4).

INSERT TABLE VIII

We also look at the relationship between product characteristics and volumes sold. We estimate the following model:

$$Log(Volumesold)_i = \alpha + \beta \times Productcharacteristics_i + \eta Y_t + \theta Di + \epsilon_{i,t}$$

where $Log(volumesold)$ is the aggegated sum of the volumes sold on the Swedish market, $characteristics_i$ si a vector or product characteristics, including minimum return, issuance price, participation rate, a "basic product" indicator, number of underlying, and the type of underlying asset.

Table C.1 in the appendix reports the results of the estimation. We observe that structured products offering a higher minimum return, in other words, better capital protection, does not attract larger total volumes. On the opposite, volumes sold increases both with the participation rate in the growth of the underlying and the issuance price. This result is in line with Célérier and Vallée (2016) that shows how banks strategically design structured products to cater to yield seeking investors, but should be interpreted with caution due to obvious sources of endogeneity.

5 Conclusion

This paper contributes to the growing literature on innovation and complexity in household finance. We use a large administrative dataset to characterize the demand for structured products, an innovative class of retail financial products with option-like features. We document the emergence of this asset class over the 2000 to 2007 period, and its impact on household financial decisions, including participation in risky asset markets and total exposure to equity risk. We also investigate the relationship between the socioeconomic characteristics of households and the properties of the structured products that they own. We report that investors in structured products face different socioeconomic circumstances than investors in traditional assets such as stocks and equity funds. The micro-evidence in this paper suggests that the introduction of retail structured products increases risky asset

market participation by attracting new categories of households.

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A Figures

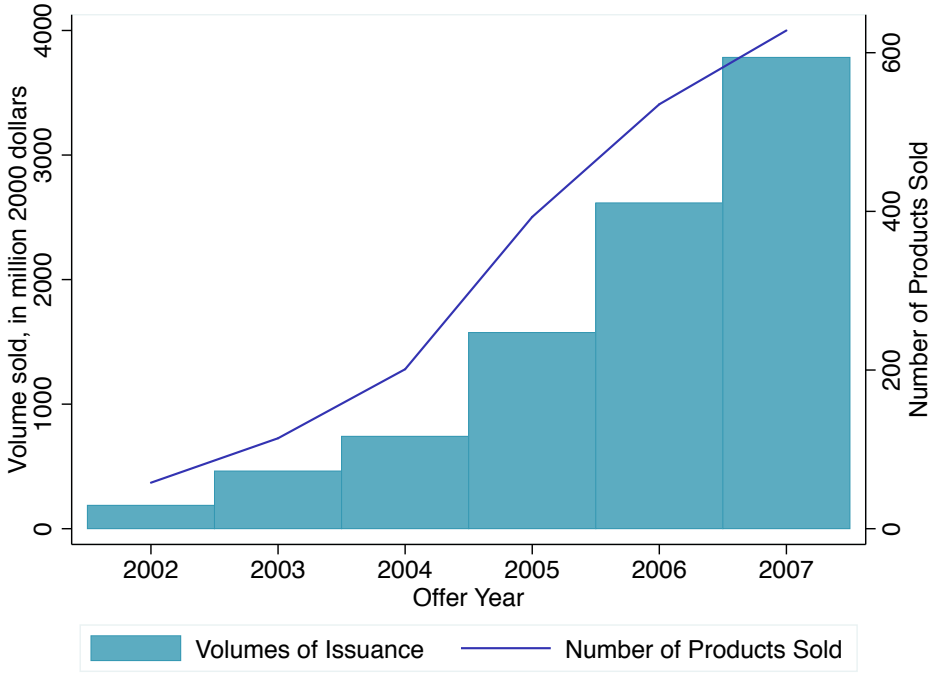

FIGURE I. Volumes and Number of Products Sold per Year

This figure shows volume issuance in millions of 2000 USD of retail structured products over the 2002-2007 period in the Swedish market.

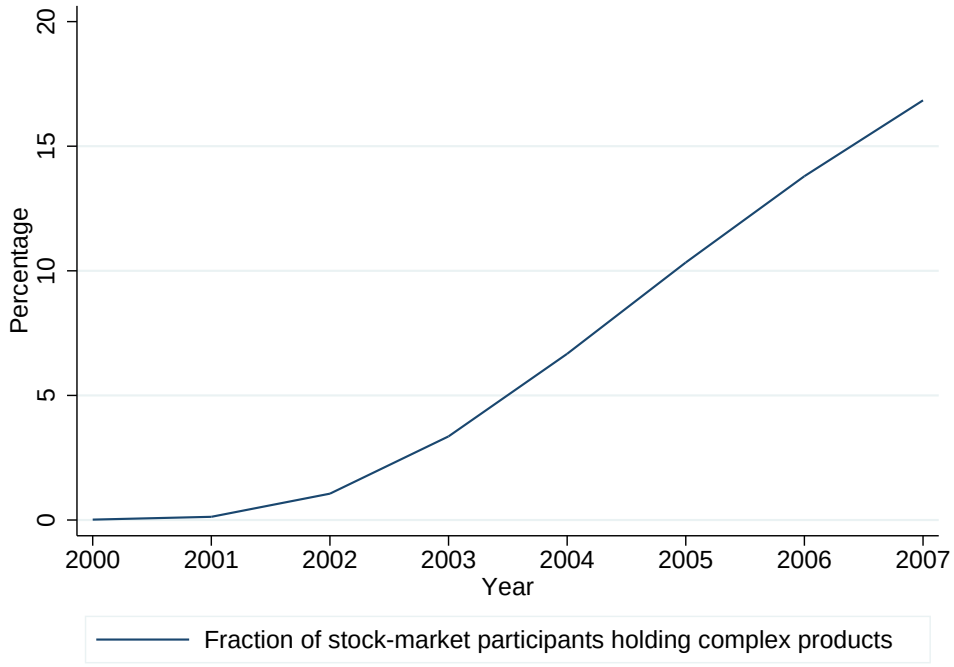

FIGURE II. Share of Stock Market Participants Holding Structured Products

This figure shows the evolution of the share of stock market participants holding structured products. A stock market participant is defined a household invested in stocks, equity mutual funds, or equity structured products.

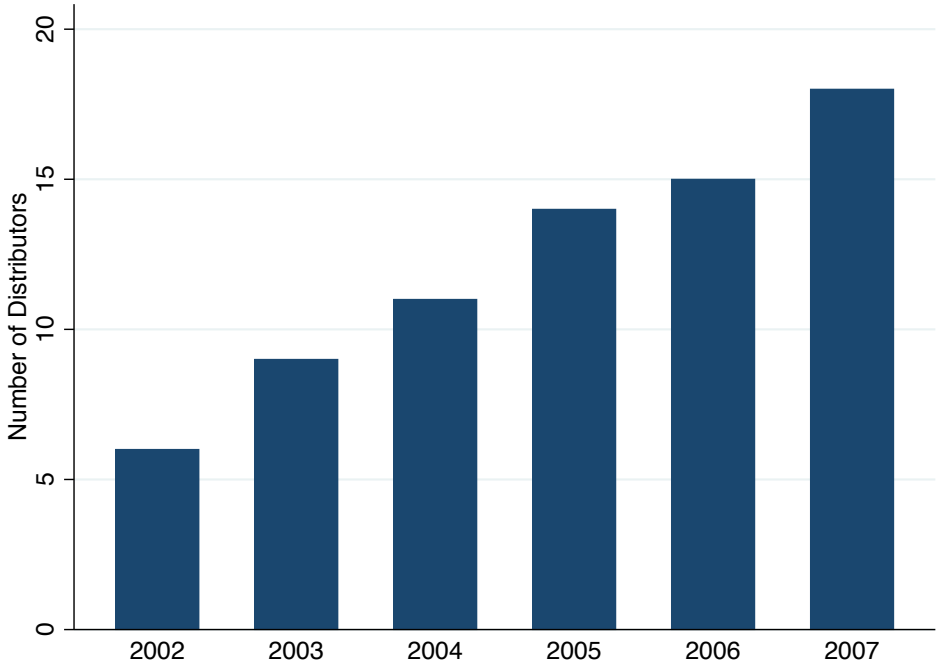

Figure III. Number of Distributors per Year

This figure shows the evolution of the number of structured product distributors over the 2002-2007 period.

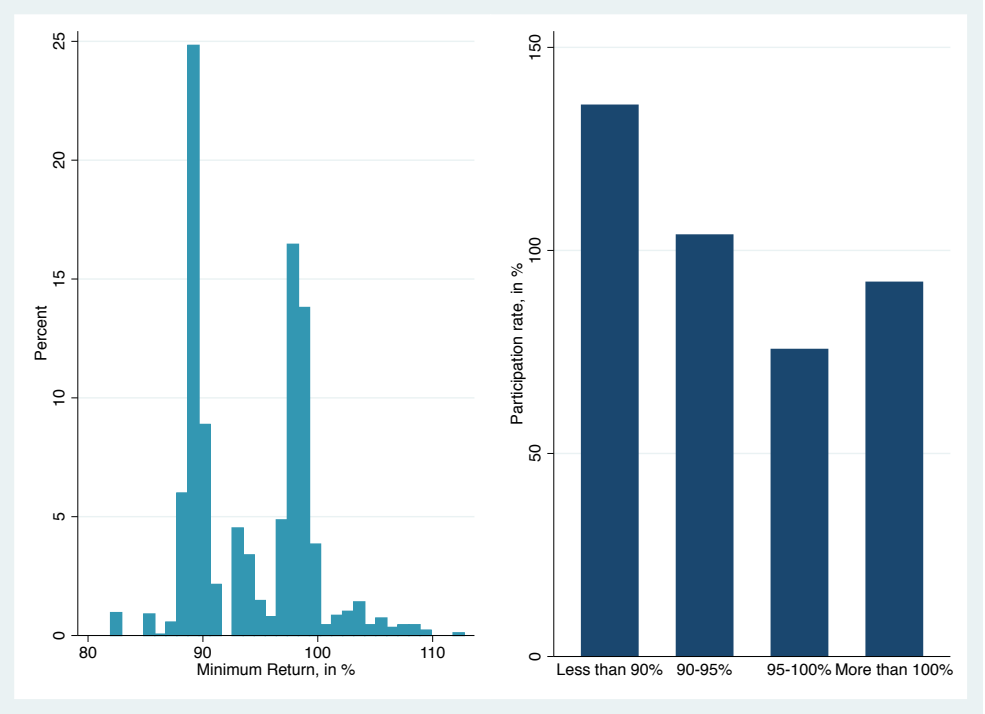

Figure IV. Minimum Return and Participation Rate in the Underlying Asset Performance

The left hand side of the figure displays the distribution of minimum return for the product of our sample. Minimum return corresponds the minimum fraction of the initial investment amount that the household gets at maturity. The right hand side of the figure plots the participation rate in the underlying asset performance over the minimum return.

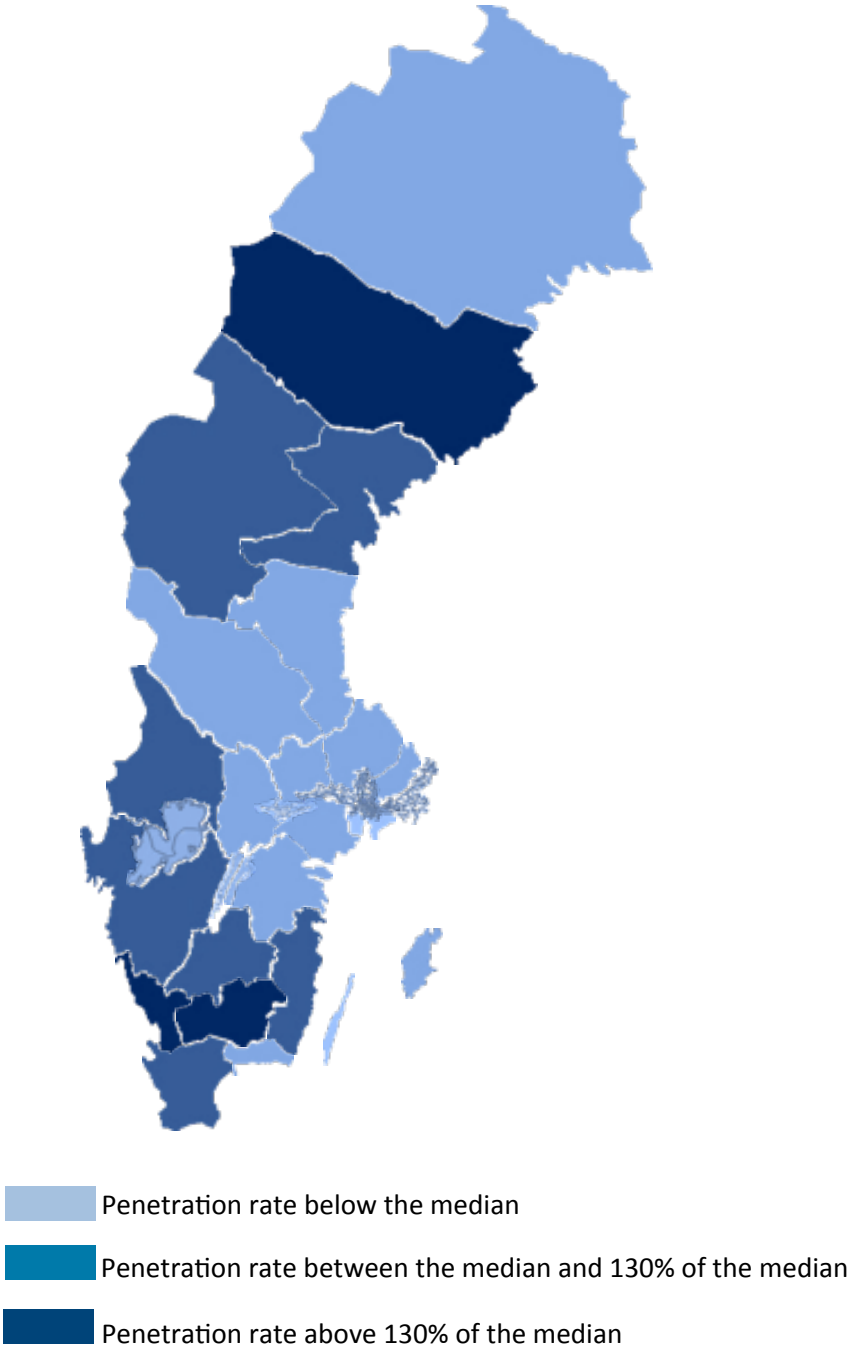

FIGURE V. Retail Structured Product Penetration Rate by Province

This figure displays the share of households invested in structured products over the 2002-2007 period, by province.

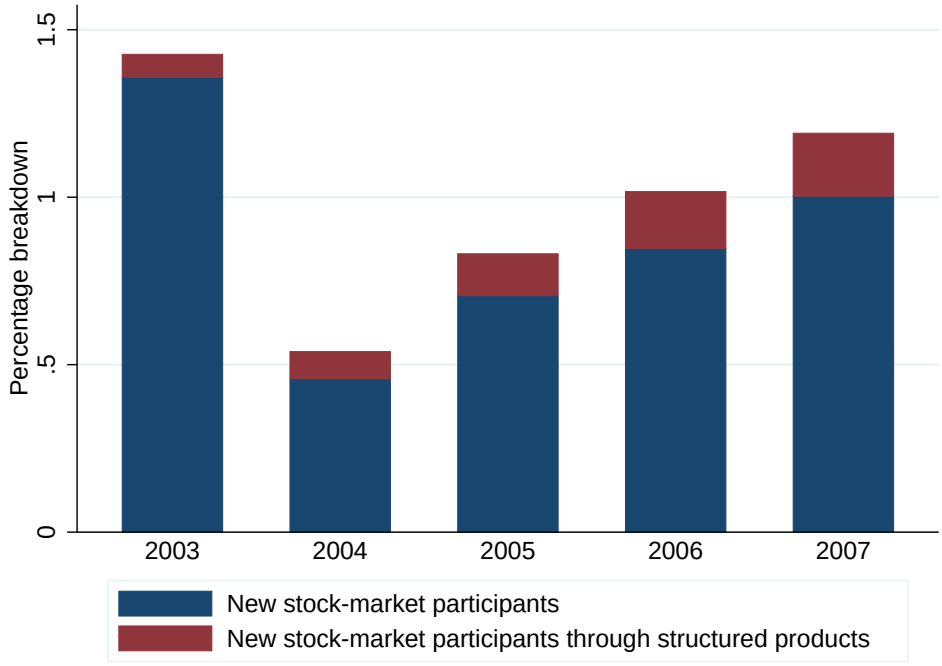

Figure VI. Evolution of the share of new stock market participants through standard equity-linked products and structured products.

This figure shows the evolution of the share of new stock market participants through standard equity-linked products and structured products over the years. New stock market participants are defined as households that were not participating in stock markets during in the four precedent years.

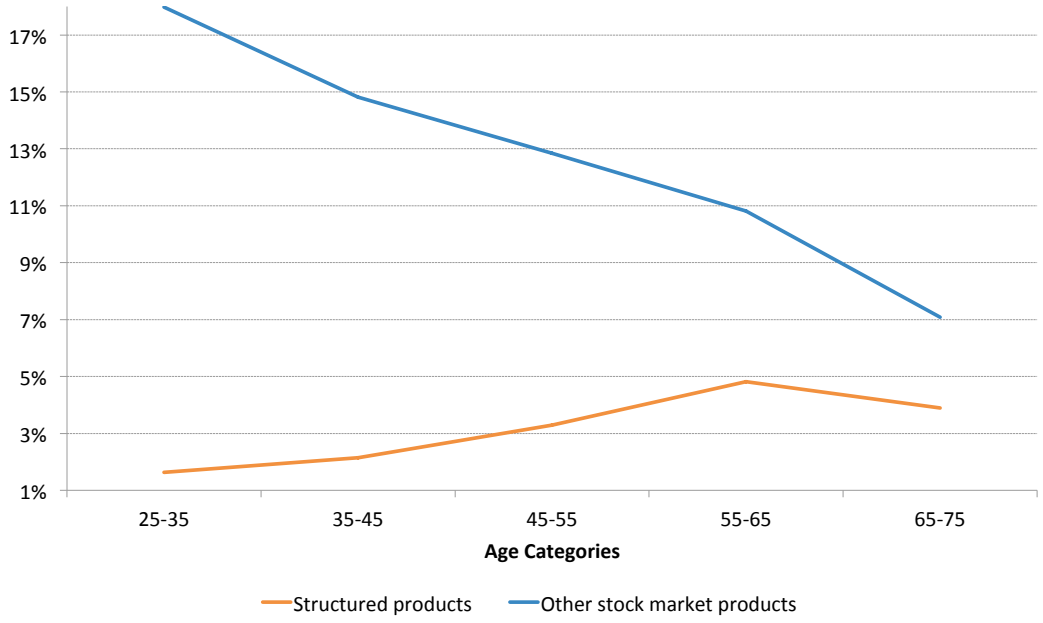

FIGURE VII. Share of new stock market participants over the 2002-2007 period through standard equity-linked products versus structured products across age categories.

This figure shows the share of new stock market participants over the 2002-2007 period through standard equity-linked products versus structured products across age categories. New stock market participants are defined as households that were not participating in stock markets in 2002 and who start participating over the 2002-2007 period.

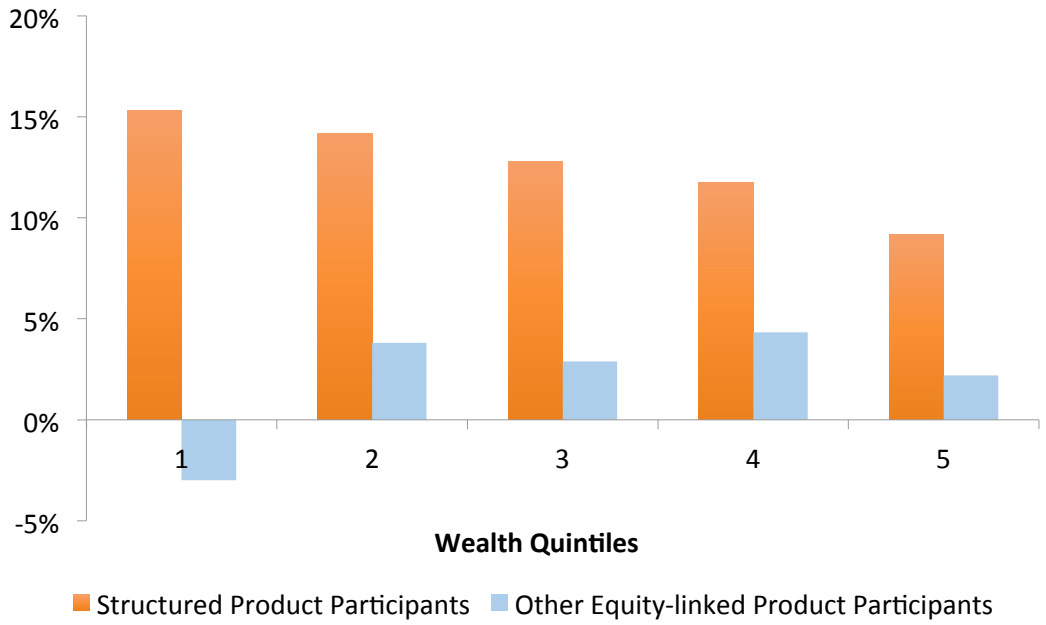

FIGURE VIII. Change in stock market exposure over the 2002-2007 period for 2007 structured product participants and other equity-linked products participants across quintiles of wealth.

This figure shows the evolution of the stock market exposure over the 2002-2007 period for 2007 structured product participants versus other equity-linked products participants. The sample includes households that are stock market participants in 2002.

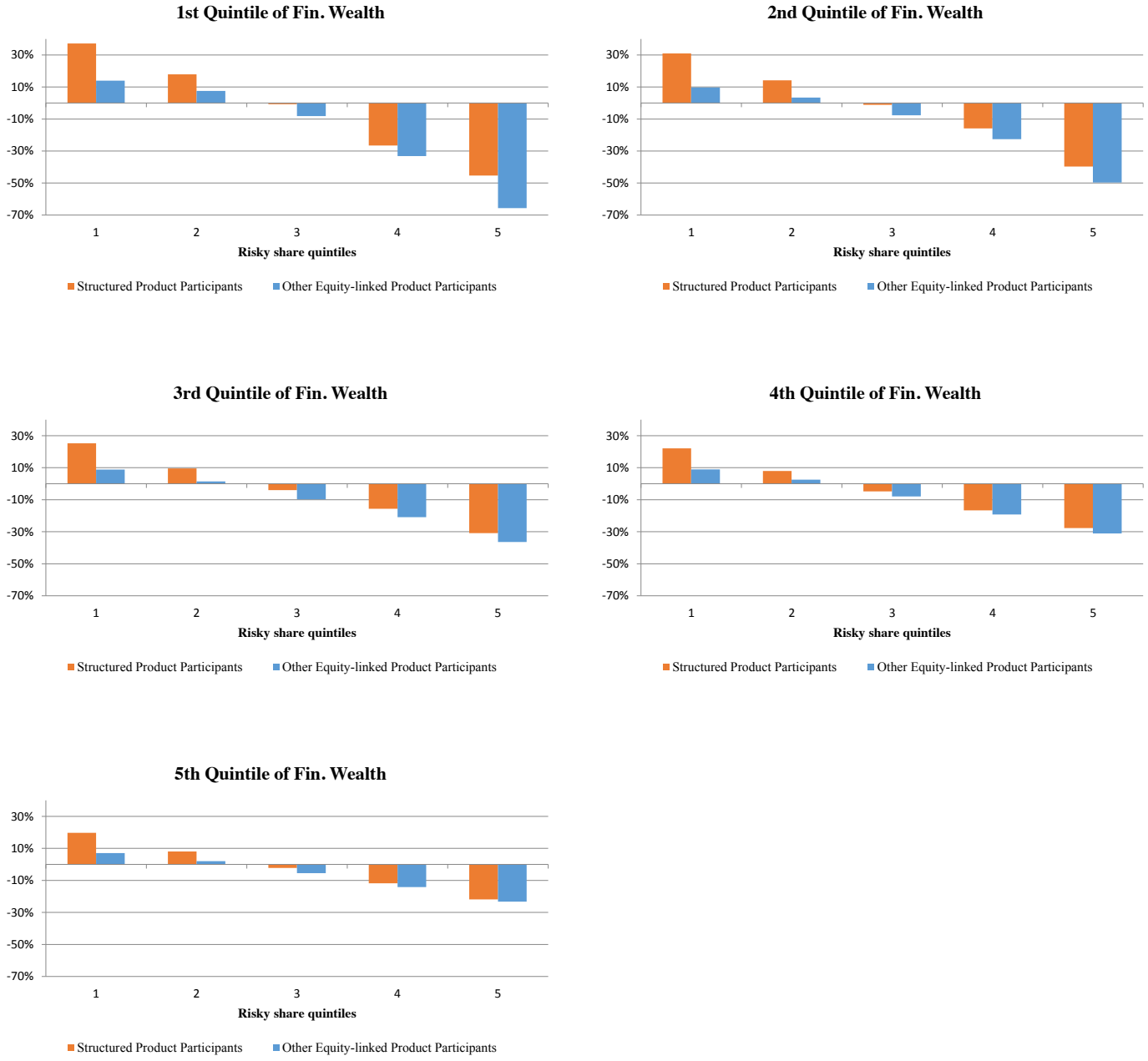

FIGURE IX. Change in stock market exposure over the 2000-2007 period for 2007 structured product participants and other equity-linked products participants across quintiles of risky share.

This figure shows the evolution of the stock market exposure over the 2000-2007 period for 2007 structured product participants versus other equity-linked products participants across quintile of risky share. The sample includes households that are stock market participants in 2000. The risky share is the share of financial wealth invested in equity-linked products in 2000.

B Tables

Table I. Market Share (in volumes) of the Structured Product Distributors

	Market Share **(1)**	Cumulated Market Share **(2)**	Entry Date **(3)**
Swedbank	30.5%	30.5%	April 2002
Handelsbanken	20.7%	51.1%	May 2002
Nordea	14.7%	65.9%	September 2002
SEB	14.6%	80.5%	April 2003
Hq bank	5.4%	85.9%	March 2003
Acta	4.4%	90.4%	January 2002
Erik Penser	2.7%	93%	January 2004
Danske Bank	2.6%	95.7%	March 2002
Avanza	1.6%	97.3%	October 2004
Kaupthing Bank	1.1%	98.3%	November 2005
Garantum	0.7%	99%	
E-trade	0.4	99.5%	
Ohman	0.2	99.7%	
Others	0.3%	100%	

This table reports the market share of each distributor, in volumes of product sold, over our sample period.

Table II. Product Characteristics - Summary Statistics

	2002-2003 (1)	**2004-2005** (2)	**2006-2007** (3)	**Full Sample** (4)
Number of Products Sold				
	172	594	1,173	1,939
Underlying				
Stock Market Exposure (in %)	**92**	**90**	**84**	**87** *(88%)*
Single Index or Share	36	41	46	44
Europe	*17.4*	*31.1*	*27.2*	*27.5*
Non Europe	*18.2*	*10.3*	*19.4*	*16.5*
Index Basket	44	37	28	32
Share Basket	9	11	8	9
Hedge Funds	5	1	2	2
Hybrid Exposure (in %)	**8**	**10**	**16**	**13** *(12%)*
Commodities	0	3	11	8
FX Rate	0	3	4	4
Credit	8	2	0	1
Interest Rate	0.3	0.3	0.3	0.3
Number of Underlying Assets	**3.3**	**3.8**	**3.4**	**3.5**
Product Design				
Capital Protected (in %)	99	99	97	98
Issue Price (in %)	103.8	104.7	105.5	105.11
Minimum Return (in %)	96.5	94.7	93.7	94.3
Average Maturity (in years)	4.1	3.8	3.3	3.5
Payoff Formula (in %)				
Call + Averaging or Asian Option	48.8	50.0	53.4	52.4
Call	2.3	10.9	8.6	8.9
Digital + Cliquet	5.3	7.6	4.9	5.7
Call + Best of Option + Averaging	0.6	5.7	5.6	5.2
Call + Best of Option + Cliquet	2.3	5.7	5	5
Volume (in million 2000 dollars)				
Mean	3.8	3.9	5.6	4.9
10th percentile	0.5	0.4	0.5	0.5
90th percentile	7.6	10.0	14.2	12.6

This table reports summary statistics for characteristics of all the retail structured products that have been sold in Sweden over the 2002-2007 period. The sample covers 1,939 products. Computations of the average minimum return are only based on the sample of capital protected products (1,768 products).

Table III. Structured Product Participants: Summary Statistics

Summary Statistics									
	All households			Stock market participants			Structured product participants		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Financial characteristics:									
Disposable income ($ per year)	31,301	24,271	52,040	37,572	31,273	63,677	44,684	35,302	122,061
Financial wealth ($)	45,193	12,306	319,020	65,858	24,012	406,367	127,483	66,499	520,194
Residential real estate wealth ($)	109,012	56,943	450,721	144,751	94,533	395,607	171,550	113,824	308,625
Investment real estate wealth ($)	15,101	0	235,718	22,128	0	300,142	30,066	0	212,361
Total wealth ($)	169,306	89,083	645,360	232,738	146,248	697,982	329,098	216,856	720,129
Total liability ($)	48,058	15,506	155,850	60,735	26,190	122,262	48,745	13,459	123,182
Leverage ratio	1.29	0.25	2.89	0.78	0.24	1.94	0.24	0.07	0.62
Portoflio characteristics:									
Risky share	0.26	0.11	0.31	0.42	0.40	0.29	0.39	0.38	0.27
Equity share	0.24	0.08	0.29	0.39	0.36	0.29	0.35	0.32	0.27
Structured product share	0.02	0.00	0.09	0.03	0.00	0.10	0.20	0.14	0.19
Demographic characteristics:									
Age	54	53	17	53	51	16	58	59	14
Number of adults	1.41	1.00	0.49	1.52	2.00	0.50	1.56	2.00	0.50
Number of dependent children	0.55	0.00	0.95	0.70	0.00	1.01	0.51	0.00	0.88
Income-weighted gender index	0.50	0.55	0.40	0.51	0.55	0.37	0.49	0.54	0.35
Urban area, dummy	0.18	0.00	0.39	0.17	0.00	0.38	0.16	0.00	0.37
Years of schooling	12.02	12.00	2.60	12.35	12.00	2.62	12.31	12.00	2.80
Entrepreneur	0.09	0.00	0.29	0.12	0.00	0.32	0.12	0.00	0.33
Retirement dummy	0.30	0.00	0.46	0.25	0.00	0.43	0.35	0.00	0.48
Unemployment dummy	0.06	0.00	0.24	0.05	0.00	0.22	0.04	0.00	0.19
Number of observations	280,340			170,623			30,229		

The table reports summary statistics of the main financial and demographic characteristics of Swedish households at the end of 2007. We convert all financial variables into real prices and U.S. dollars using the average exchange rate in 2000.

Table IV. Structured Product Participants: Logit Analysis

	=1 if participating in			
	Structured Products **(1)**	Basic Structured Product **(2)**	Stocks **(3)**	Equity Fund **(4)**
Log(Disposable Income)	0.303***	0.068	0.347***	0.298***
	(0.032)	(0.071)	(0.034)	(0.024)
Log(Financial Wealth)	0.525***	0.722***	0.598***	0.381***
	(0.015)	(0.029)	(0.008)	(0.008)
Log(RealEstate)	0.026***	0.014*	0.043***	0.034***
	(0.003)	(0.008)	(0.002)	(0.001)
Log(Leverage)	-0.382***	-1.279***	0.113***	0.046***
	(0.049)	(0.226)	(0.017)	(0.015)
Age	0.005***	0.002	-0.007***	-0.032***
	(0.002)	(0.004)	(0.001)	(0.001)
Log(years of schooling)	-0.020	-0.595***	0.733***	0.473***
	(0.045)	(0.203)	(0.036)	(0.043)
Risky Share	0.997***	0.623***	2.165***	3.818***
	(0.027)	(0.134)	(0.047)	(0.096)
Gender Income Weight	-0.458***	-0.718***	0.596***	-0.322***
	(0.022)	(0.131)	(0.019)	(0.023)
Urban Area Dummy	-0.136*	-0.672***	0.134**	-0.321***
	(0.079)	(0.110)	(0.058)	(0.071)
Observations	207,013	207,013	207,013	207,013
Pseudo R^2	0.175	0.141	0.290	0.360

This table reports logit regression coefficients where the dependent variable is a dummy equal to one if the household is invested in a given asset class (structured product, basic structured product: with domestic underlying assets and simple payoff formulas, stocks and equity mutual funds) during the 2003-2007 period. Explanatory variables are as per 2002. The analysis is conducted over the whole representative sample. Standard errors are clustered at the parish level.

Table V. Retail Structured Products: Who are the New Participants through Structured Products?

	=1 if the new participant is participating in...				
	Structured Products **(1)**	Basic Structured **(2)**	Funds **(3)**	Stocks **(4)**	Structured Products **(5)**
Log(Disposable Income)	0.264***	0.199**	0.249***	0.131**	0.001
	(0.084)	(0.084)	(0.029)	(0.055)	(0.039)
Log(Financial Wealth)	0.575***	0.599***	0.380***	0.165***	0.358***
	(0.032)	(0.031)	(0.021)	(0.028)	(0.034)
Log(RealEstate)	0.044***	0.048***	0.035***	0.046***	0.014**
	(0.005)	(0.006)	(0.002)	(0.005)	(0.006)
Log(Leverage)	-0.344***	-0.215**	0.034	0.019	-0.323***
	(0.080)	(0.090)	(0.024)	(0.035)	(0.069)
Age	0.012***	0.017***	-0.014***	-0.010***	0.032***
	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
Log(years of schooling)	0.399***	0.390**	0.554***	1.178***	-0.063
	(0.139)	(0.157)	(0.067)	(0.152)	(0.166)
Gender Income Weight	-0.596***	-0.616***	-0.281***	0.439***	-0.451***
	(0.064)	(0.075)	(0.033)	(0.092)	(0.077)
Banker Dummy	-0.178	-0.235	0.086	-0.535	-0.001
	(0.379)	(0.458)	(0.161)	(0.473)	(0.442)
Urban Area Dummy	-0.028	-0.154***	-0.062**	0.070	0.085
	(0.058)	(0.043)	(0.024)	(0.092)	(0.080)
Sample	All	All	All	All	New Participants
Observations	87,842	87,842	87,842	87,842	10,859
$PseudoR^2$	0.115	0.116	0.050	0.030	0.122

This table reports logit regression coefficients where the dependent variable is a dummy equal to one if the household gains exposure through stock markets during the 2003-2007 period through a specific instrument (structured product, basic structured product: with domestic underlying assets and simple payoff formulas, stocks and equity mutual funds). Explanatory variables are as per 2002. The analysis is restricted to household that are not participating to stock markets in 2002 and the 4 year before. Standard errors are clustered at the parish level.

Table VI. Substitution Effects and Household Characteristics

	Log of Share of Financial Wealth Invested in...							
	Market-linked Products						Equity Fund	Cash
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SP Share	-0.277***	0.192**	-0.446***	-0.200**	0.035	-0.265***	-0.232***	-0.635***
	(0.007)	(0.084)	(0.011)	(0.080)	(0.033)	(0.012)	(0.007)	(0.008)
SP Share × Log(Financial Wealth)		-0.037***						
		(0.007)						
SP Share × Log(Risky Share)			-0.186***					
			(0.010)					
SP Share × Log(Years of Schooling)				-0.031				
				(0.032)				
SP Share × # Age					-0.006***			
					(0.001)			
SP Share × Gender Weight						-0.026		
						(0.020)		
Controls								
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income and Wealth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	900,271	900,271	670,267	900,271	900,271	900,271	716,237	1418354
R^2	0.810	0.810	0.813	0.810	0.810	0.810	0.818	0.858

This table displays OLS panel regression coefficients. The dependent variable is the share of financial wealth invested in products linked to stock markets, excluding structured products. *SPshare* is the share of financial wealth invested in structured products linked to stock markets. Sample period is 2002-2007.

Table VII. Substitution Effects and Product Characteristics

	Log of Share of Financial Wealth Invested in...			
	Market-linked Products		Equity Fund	Cash
	(1)	(2)	(3)	(4)
SP Share	-0.275***	-0.294***	-0.197***	-0.402***
	(0.014)	(0.016)	(0.015)	(0.018)
SP Share × Minimum return>=1		0.083***	0.043*	-0.085***
		(0.023)	(0.022)	(0.025)
Controls				
Demographics	Yes	Yes	Yes	Yes
Income and Wealth	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes
Observations	73,911	69,574	60,279	76,184
R^2	0.913	0.914	0.914	0.879

This table displays OLS panel regression coefficients. The dependent variable is the share of financial wealth invested in products linked to stock markets, excluding structured products. $SPshare$ is the share of financial wealth invested in structured products linked to stock markets. Sample period is 2002-2007. The sample is restricted to structured product participants, as the dummy variable *Minimum Return* $\geq$ *1* is defined only for structured products.

Table VIII. Structured Product Design and Household Characteristics

	Minimum Return (log)	Issue Price (log)	Participation Rate (log)	Basic Product (dummy)	Underlying Type (categories)	# Underlyings (log)
	OLS	*OLS*	*OLS*	*Logit*	*Ordered logit*	*OLS*
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Disposable Income)	-0.009***	0.166***	0.031***	-0.298***	0.134***	0.038***
	(0.001)	(0.009)	(0.002)	(0.013)	(0.009)	(0.002)
Log(Financial Wealth)	-0.005***	0.082***	0.028***	-0.201***	0.122***	0.013***
	(0.000)	(0.004)	(0.001)	(0.005)	(0.003)	(0.002)
Log(RealEstate)	-0.000***	0.007***	0.002***	-0.013***	0.007***	0.002***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Log(Leverage)	-0.013***	0.241***	0.086***	-0.402***	0.221***	0.023***
	(0.001)	(0.015)	(0.004)	(0.022)	(0.019)	(0.008)
Risky Share	-0.013***	0.228***	0.030***	-0.328***	0.290***	0.065***
	(0.000)	(0.007)	(0.003)	(0.015)	(0.008)	(0.004)
Age	0.000***	-0.005***	-0.002***	0.006***	-0.004***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(years of schooling)	-0.018***	0.318***	0.091***	-0.619***	0.327***	0.096***
	(0.001)	(0.019)	(0.006)	(0.029)	(0.018)	(0.006)
Gender Income Weight	-0.007***	0.134***	0.044***	-0.216***	0.112***	0.017***
	(0.000)	(0.006)	(0.003)	(0.007)	(0.005)	(0.003)
Urban Area Dummy	-0.010***	0.156***	0.011	-0.303***	0.178***	0.046***
	(0.002)	(0.037)	(0.010)	(0.032)	(0.018)	(0.008)
New Entrant Dummy	0.011***	-0.184***	-0.068***	0.346***	-0.392***	-0.108***
	(0.001)	(0.013)	(0.008)	(0.024)	(0.021)	(0.009)
Observations	2,289,626	2,406,350	1,608,748	2,405,810	2,406,350	2,406,350
R^2	0.068	0.068	0.040	0.035	0.011	0.006

This table reports OLS and logit regression coefficients where the dependent variable correspond to a characteristic of a structured products. Observations are at the household-instrument level.

C APPENDIX

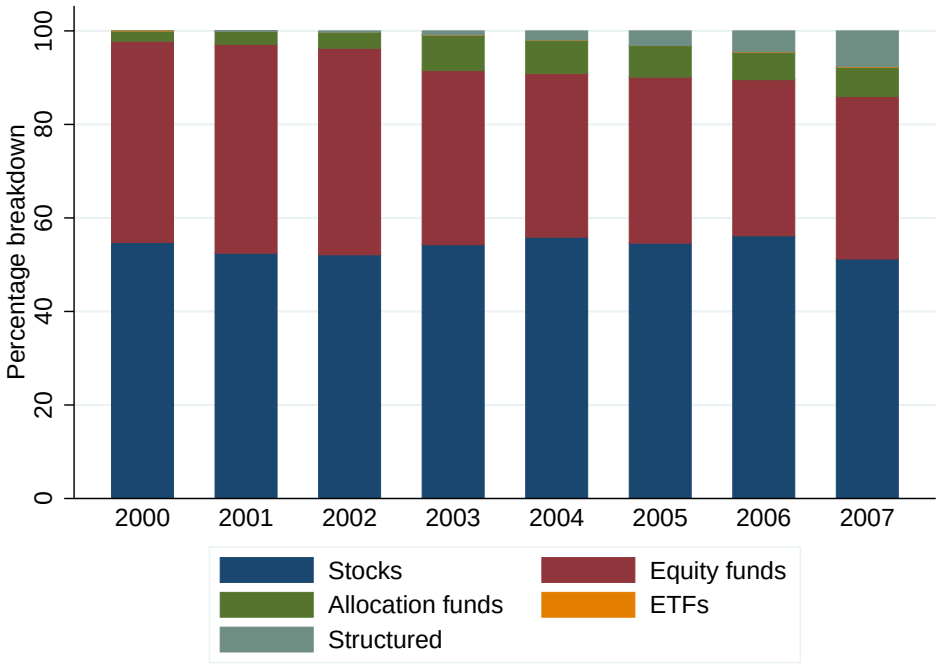

Figure C.1. Breakdown of Aggregated Household Investment in Stock Markets.

This figure shows the evolution of the breakdown invested in stock markets over the 2002-2007 period by Swedish households.

Table C.1. Product Characteristics and Volumes Sold

	Log of Volumes Sold					
Minimum Return (log)	-0.357 (0.468)					
Issue Price (log)		0.064*** (0.021)				
Participation Rate (log)			0.215** (0.088)			
Basic Product Dummy				0.305*** (0.078)		
# Underlying Assets (log)					-0.067** (0.028)	
Term (log)	-0.273*** (0.069)	-0.193*** (0.052)	-0.286*** (0.082)	-0.161*** (0.051)	-0.138** (0.056)	-0.177*** (0.053)
Equity linked Product	-0.003 (0.345)	0.158 (0.256)	. .		0.302 (0.253)	0.226 (0.436)
Equity linked × 2005						0.419 (0.497)
Equity linked × 2005						-0.402 (0.507)
Equity linked × 2005						-1.008** (0.503)
Equity linked × 2006						-0.078 (0.496)
Equity linked × 2007						-0.553 (0.497)
Commodity	0.088 (0.350)	0.187 (0.263)	-0.004 (0.103)		0.355 (0.262)	0.021 (0.317)
Commodity × 2005						-0.890** (0.424)
Commodity × 2006						0.089 (0.412)
Commodity × 2007						-0.262 (0.403)
Credit Event	-0.149 (0.369)	0.043 (0.288)	. .		0.063 (0.283)	0.139 (0.450)
Credit × 2003						-0.091 (0.547)
Credit × 2004						-0.258 (0.545)
Credit × 2005						-0.938* (0.547)
Foreign Exchange	0.271 (0.368)	0.480* (0.286)	0.449*** (0.161)		0.605** (0.284)	-0.863*** (0.245)
Foreign Exchange × 2005						0.231 (0.415)
Foreign Exchange × 2006						1.179*** (0.443)
Foreign Exchange × 2007						1.061*** (0.389)
Hedge Fund	0.217 (0.374)	0.357 (0.292)	0.334* (0.188)		0.511* (0.292)	
Controls						
Year FE						
Distributor FE						
Observations	1,765	1,886	1,066	1,886	1,886	1,886
R^2	0.363	0.356	0.376	0.358	0.355	0.357

This table shows regressions coefficients where the dependent variable is the log of volumes sold for each product. All continuous variables are in log. Observations are at the product level.

Table C.2. Substitution Effects from ETF funds and Household Characteristics

	Log of Share of Financial Wealth Invested in... Market-linked Products						Equity Fund	Cash
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ETF fund Share	-0.735***	0.241	-0.787***	-2.080*	-0.275	-0.793***	-0.390***	-0.323***
	(0.092)	(0.803)	(0.119)	(1.177)	(0.313)	(0.258)	(0.118)	(0.089)
ETF fund Share × Log(Financial Wealth)		-0.073						
		(0.061)						
ETF fund Share × Log(Risky Share)			0.162					
			(0.229)					
ETF fund Share × Log(Years of Schooling)				0.510				
				(0.455)				
ETF fund Share × # Age					-0.010			
					(0.007)			
ETF fund Share × Gender Weight						0.085		
						(0.352)		
Controls								
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income and Wealth								
Year FE								
Individual FE								
Observations	926,930	926,930	684,092	926,930	926,930	926,930	716,237	1418354
R^2	0.802	0.802	0.805	0.802	0.802	0.802	0.817	0.854

This table displays OLS panel regression coefficients. The dependent variable is the share of financial wealth invested in products linked to stock markets, excluding structured products. *SPshare* is the share of financial wealth invested in structured products linked to stock markets. Sample period is 2002-2007.

Table C.3. Substitution Effects Across Products

	Share of Financial Wealth Invested in							
	Stock Markets		Stocks	Equity Fund	Alloc. Fund	Fixed Inc. Fund	Other	Bonds
Statistics (mean)			11%	21%	4%	2.5%	0.4%	0.7%
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Complex Share	-0.317***	-0.323***	-0.123***	-0.270***	-0.108***	-0.094***	-0.072	-0.120***
	(0.004)	(0.043)	(0.003)	(0.004)	(0.004)	(0.006)	(0.954)	(0.034)
Complex Share × FWQ2		0.094**						
		(0.045)						
Complex Share × FWQ3		0.070						
		(0.044)						
Complex Share × FWQ4		0.027						
		(0.044)						
Complex Share × FWQ5		-0.042						
		(0.044)						
Controls								
Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Income and Wealth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3830284	3830284	2157806	3045712	1144574	582,873	104,562	159,949
R^2	0.797	0.797	0.850	0.803	0.832	0.866	0.999	0.966

...