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Zusammenfassung / Abstract

This paper studies the effect of institutional reform on the decision to hold risky assets at the example of the natural experiment of German Division and Reunification. We present empirical evidence indicating that even 16 years after German Reunification risky portfolio choice and composition differed systematically between East and West German bank customers, even after controlling for socio-demographic factors. While these differences are especially pronounced for bank customers with experiences in the former communist system, even the younger generation of East Germans still differs remarkably from their West German counterpart in terms of risky asset choice. Thus, informal institutions tend to have more long-lasting effects on portfolio behavior as previous studies seem to imply.

1. Introduction

Although North and Thomas (1973) emphasized the fundamental role of institutions in explaining differences in comparative economic growth quite early, economists have neglected institutional factors for long periods of time. Institutions, understood as political constraints which are persistent over time and show depth and durability (Glaeser et al., 2004), can be formal or informal. Formal institutions (such as e.g. constitutions or electoral rules) are typically laid down in the written legal framework and e.g. define (and constrain) the role of the state in a society. Informal institutions are the rules shaping human behavior in everyday interactions such as social norms, customs, attitudes and beliefs about right and wrong (North, 1990). While informal rules evolve under and are influenced by formal institutions, they are not directly defined by politicians.

Throughout the last two decades, the view on the role of institutions has changed considerably. Many economists nowadays believe that good institutions are important prerequisites for economic prosperity. This belief is guided by the theoretical reasoning of New Institutional Economics[1] and is supported by a growing body of empirical research.[2] In order to learn how institutions affect economic outcomes it is important to understand how formal institutions shape informal institutions such as individual preferences and influence economic behavior. Moreover, whenever "good institutions" help to achieve prosperity, countries with unfavorable institutions will likely try to improve them. It is thus an intriguing question how quickly institutional change will affect individual preferences and behavior.

Recently, a number of studies has exploited the natural experiment of German Division and Reunification to study the effect of institutions on preferences and behavior.[3] For almost 40 years the populations of East and West Germany experienced completely different political, social and economic systems and, thus, have lived under completely different formal and informal institutions. Using historical data, Alesina and Fuchs-Schündeln (2007) show that before 1945, the regions belonging to East and West Germany were similar regarding their income levels and other economic dimensions, e.g., the share of the population working in industry, agriculture, or commerce. Moreover, historical election results indicate no differences with respect to political views. Thus, differences in informal institutions which can be observed between the West and the East German population after German Reunification can clearly be attributed to the treatment, i.e. the differences in the formal institutions throughout the period of German Division. The formal institutions in East

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[1]For an overview on the most important theoretical arguments see Acemoglu et al. (2005).

[2]See, among others, e.g. Knack and Keefer (1995), Barro (1996), Knack and Keefer (1997), Levine (1998), LaPorta et al. (1999), Acemoglu et al. (2001) and Rodrik et al. (2004).

[3]In an early experimental study Ockenfels and Weimann (1999) find East German students to be less cooperative than their West German counterparts, an effect which proves to be quite long-lasting as the follow-up study by Brosig-Koch et al. (2011) indicates. Almost all other important studies using the natural experiment of German Divison and Reunification are based on data from the German Socio-Economic Panel (SOEP). Alesina and Fuchs-Schündeln (2007) find East Germans to prefer higher levels of redistribution than West Germans. Fuchs-Schündeln and Schündeln (2005) report higher levels of precautionary saving among East Germans. The effects turn out to be the more pronounced the longer individuals made their experiences with the communist system. Moreover, the effects tends to decay in the course of time. Heineck and Süssmuth (2013) find lower levels of social trust among East Germans even 20 years after German Reunification. Friehe et al. (2015) study the influence of the socialist regime on East German personalities and find significant differences in the locus of control, neuroticism, conscientiousness and openness. Using data from the German Mikrozensus Fuchs-Schündeln and Masella (2015) find an effect of socialist education on the likelihood to obtain a college degree and several labor market outcomes.

and West Germany differed in many respects throughout the time of German Separation. The most striking difference was the socio-economic system. While West Germany adopted the system of a capitalistic market economy, the government of the German Democratic Republic (GDR) opted for a communist system with a centrally planned economy. In such a command economy most economic decisions are planned by the central government authority and organized along a top-down administration. Especially decisions regarding production output requirements and investments are decided by planners from the top of the chain of command. Such a system leaves almost no room for private entrepreneurship. As Fuchs-Schündeln and Masella (2015) discuss in detail, the GDR installed an educational system which aimed at creating socialist personalities. The school curricula contained a comparatively high share of courses on socialism and communism. Moreover, the GDR school system did not incentivize critical thinking but suppressed diverging opinions (Block and Fuchs, 1993) and the curricula allowed only minimal scope for teacher or student initiative.

In this paper we employ the natural experiment of German Division and Reunification to study the effect of institutions on portfolio choice of individuals. Understanding how institutions affect asset market participation is important as financial sector development in general is often seen as a prerequisite for economic prosperity (Levine, 1997). As liquid stock markets facilitate the possibilities to trade ownership and to diversify portfolios (Hasan et al., 2009) the existence of effective stock markets increases social welfare[4] and contributes to economic growth.[5] Understanding whether and how quickly individuals change their portfolio behavior in response to changes in formal institutions is also helpful to forecast and evaluate the transformation process in the various East European and Asian transformation countries.[6]

As it was the case in most centrally planned economies, the GDR did not permit any financial transactions between enterprises and households (Bofinger, 1990, Wolf, 1985). Instead of establishing a private capital market, private savings were collected by state savings banks, transferred to the GDR state bank and distributed to state firms according to the central economic plan (Siebert, 1990). As a consequence of these formal institutions, the East Germans did not collect any experiences with private capital markets and products such as investment funds, bonds, stocks or derivatives. However, the formal institutions in GDR times not only disallowed East Germans to collect their experiences with capital markets. As outlined earlier, the GDR system and its policies also influenced informal institutions such as self-reliance, the belief to be able to influence one's own life (locus of control) and trust.[7] Capitalist behavior such as profit seeking or entrepreneurial activity as integral parts of capitalist systems were deemed as "asocial", "decadent" and "imperialistic" (see Malycha and Winters, 2009). Against this background Bauernschuster et al. (2010) suspect that "the values and norms, i.e., the implicit institutions of the GDR society, were deliberately manipulated"[8] and due to the fact that "implicit institutions develop rather slowly"[9] might affect individual behavior even

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[4] See Cocco (2005).

[5] See Chinn and Ito (2006), Rousseau and Wachtel (2000) and Rousseau and Xiao (2007) for empirical support of this line of argument.

[6] As Williamson (1996) argues, creating effective institutions governing economic transactions is the major task to be solved within the transformation process of transition countries.

[7] Williamson (2009) defines informal institutions as economic culture via the four determinants trust, respect, individual self-determinantion and obedience.

[8] Bauernschuster et al. (2010), p. 6.

[9] Bauernschuster et al. (2010), p. 6.

after formal institutions have changed.

The results reported in Fuchs-Schündeln and Haliassos (2015) indicate that East Germans collected their experiences with the private capital market quite quickly after German Reunification. Based on data from the German Socio-Economic Panel (SOEP) they find that the probability to hold risky assets and to participate in the debt market converged quickly between East and West Germany after German Reunification (once they correct for the differing individual characteristics). However, no evidence is yet available on the question whether East and West Germans differ in the sort of risky assets they hold and how much wealth they invest in risky assets.

In our study we employ a unique set of individual customer data from a number of German savings banks, located in both parts of Germany to study whether East and West German bank customers differ systematically in their portfolio choice. When doing so we follow Miniaci and Weber (2002) and distinguish between the extensive and intensive portfolio decision, as the decision to hold risky assets at all might substantially differ from the one how much of these assets should be held. Our estimation strategy therefore consists of two steps. In a first step we study the decision to hold risky assets at the extensive margin. As our explanatory variable is binary in this case, we employ a logit estimation approach for this purpose. We then turn to the analysis of the decision to hold risky assets at the intensive margin, i.e. individual risky asset demand.[10] In order to account for heavy censoring (the well established stockholding puzzle in the household finance literature) and likely occurring non-linearities we apply a conditional OLS and a censored quantile-regression approach to the data in the second step of our analysis.

Broadly in line with the findings of Fuchs-Schündeln and Haliassos (2015) for survey data we detect no significant differences in the decision to hold any sort of risky asset at the extensive margin. However, we find West Germans to take a more active role in portfolio decisions than their East German counterparts. Whereas East Germans tend to rely much more on externally managed funds, West Germans more often buy stocks and bonds on their own or at least opt for investment funds not managed by their own bank. The differences between East and West German bank customers turn out to be even larger at the intensive margin. Bank customers living in West Germany hold significantly more risky assets, even after controlling for differences in their individual customer characteristics such as income and wealth. This holds especially true for externally managed funds, stocks and bonds. Moreover, the difference to the East Germans increases in the conditional level of risky asset holdings. We argue that the reported differences in portfolio behavior between East and West Germans are likely due to the earlier mentioned differences in informal institutions such as self-reliance, trust and locus of control as a consequence of the communist treatment. We also detect differences between East and West Germans to be more pronounced for individuals which had longer experiences with the communist system. Interestingly enough, we also find differences between East and West Germans in the generation of bank customers which itself was too young at the time of German Reunification to have made its own financial experiences in the former system. Thus, informal institutions seem to have quite persistent effects on portfolio choice.

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[10]As our dataset likely gives no complete account of bank customers' wealth we refrain from studying the share of risky assets in all assets, as it is often done in survey-based literature.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 introduces the employed dataset and delivers summary statistics. Section 4 is concerned with risky portfolio choice at the extensive margin whereas section 5 deals with the intensive dimension. Section 6 considers differences in portfolio choice for subgroups with different experiences with the former communist system due to their age at German Reunification. Section 7 summarizes the main results and concludes.

2. Related Literature

The question how corporations (should) decide on their financial portfolios is a major topic of corporate finance. However, since private households differ substantially from corporations, the results of corporate finance research can hardly be applied to financial decisions of private households (Guiso and Sodini, 2013). Against this background a new strand of the literature, household finance, evolved since the early 1990s Haliassos (2008). One of the most important findings of this literature is closely related to the participation decision, i.e. the extensive dimension to hold risky assets: Much less private households tend to hold risky assets as classic portfolio choice theory (e.g. Merton, 1969) predicts. This phenomenon is referred to as the *stockholding puzzle*. The literature mostly explains this puzzle by households' participation costs and complementary effects (e.g. Christelis et al., 2011). Triggered by the early paper by Haliassos and Bertaut (1995), a quickly growing empirical literature on the determinants of the decision to hold risky assets evolved.

Most of this literature is concerned with studying socio-demographic determinants of risky asset demand. Among the most often considered factors are income (risk) (e.g. Vissing-Jørgensen, 2002 or Guiso et al., 1996), financial wealth (e.g. Haliassos and Bertaut, 1995, Börsch-Supan and Eymann, 2002 or Calvet and Sodini, 2014), education (e.g. Campbell, 2006 or Cole et al., 2014), occupation (e.g. Campbell, 2006 or Haliassos and Bertaut, 1995, age[11] and gender (e.g.Barber and Odean, 2001). Additional socio-demographic factors which have been considered are ethnicity (Haliassos and Bertaut, 1995), marital status and parentship (Love, 2010), health status (Rosen and Wu, 2004), cognitive abilities (e.g. Christelis et al., 2010 or Grinblatt et al., 2011) and financial literacy (Van Rooij et al., 2011).

Besides socio-demographic variables, institutional factors have also been considered as determinants of the decision to hold risky assets. Hong et al. (2004) argue, based on a well-defined theoretical model, that , the informal institution, sociability might trigger stock market participation either via word-of-mouth and observational learning or the pleasure of being capable of taking part in conversations and discussions on market developments with other fellow participants of the stock market. Based on survey evidence from the Health and Retirement Study (HRS) Hong et al. (2004) study this hypothesis empirically. After classifying the survey respondents into socials and non-socials, based on survey questions on interactions with their

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[11]While age is almost always included in analyses of household portfolios, the exact specification differs from study to study. Some papers include age in a linear fashion (e.g. Calvet et al., 2007) while others such as e.g. Campbell (2006) use a polynomial specification. The least restrictive way of modeling age effects is the inclusion of age (group) dummies (Guiso et al., 2003). Due to the fact that most studies use cross-section data, the existing empirical evidence might be subject to an identification problem as it cannot be ruled out that the results are driven by cohort effects (Ameriks and Zeldes, 2004). The common practice of estimating age effects is thus only correct if in fact cohort-specific effects are absent.

neighbors and church attendance, the authors in fact find a strong, robust and statistically significant effect of sociability on stock market participation. A reassessment for German data by Dierkes et al. (2011) leads to the result that the effect of sociability on the probability of holding risky assets is much stronger among people younger than 50 years. Guiso et al. (2008) analyze the influence of general trust, another informaal institution, on stock market participation. Using surveys from different countries, the authors show that less trustful individuals are also less likely to hold stocks. A joint analysis of trust and sociability on stock market participation can be found in Georgarakos and Pasini (2011). In their study of 13 industrialized countries, Christelis et al. (2013) find considerable differences in stock market participation on the country level even after controlling for differences in population characteristics. The authors find that these differences to some extent are related to country differences in, formal and informal, institutional factors such as shareholder rights and the level of prevailing trust in the referring countries. Both, a higher level of shareholder rights and a higher level of trust tends to increase stock market participation.

Our subsequent analysis is most closely related to the very small literature on the effects of institutional change on individual portfolio choice. This literature consists, to the best of our knowledge, of only two papers.

The first paper is the study by Osili and Paulson (2008), which employs individual survey data from the U.S., extracted from the Survey of Income and Program Participation. The survey also contains information on U.S. immigrants and allows identifying their country of origin. Osili and Paulson (2008) argue that immigration can be interpreted similarly as an institutional reform as the immigrants are suddenly confronted with completely different formal institutions while at least initially their attitudes are still shaped by the experiences they made in their countries of origin. The authors find that country-of-origin institutional quality has a strong effect on the likelihood of immigrants' stock market participation. Lower institutional quality in the country of origin turns out to depress the probability to hold stocks significantly. Moreover, the effect is amplified by living in a neighborhood with many other immigrants from the same country of origin. However, the effect tends to decrease slowly in the course of time and completely diminishes after roughly a quarter of a century living under the new formal institutional framework. Osili and Paulson (2008) find no effect of country-of-origin institutions at all for immigrants which have been comparatively young when immigrating. Similarly, the authors find no empirical evidence indicating that informal institutions are transmitted to younger generations. However, it is less clear in how far Osili and Paulson's (2008) results can really answer the question how institutional reforms affect household finance in general. Two major problems render this generalization critical. First, it cannot be ruled out that the sample of emigrants differs considerably from the rest of the population of the country of origin (Borjas, 1994). One might suspect that the emigrants are less risk averse and better educated than the average citizen. Second and even more important, one might suspect that it makes a huge difference whether an individual experiences a change in formal institutions in his country of origin or whether it experiences this change by moving to a foreign country. In the first case the individual is surrounded by other citizens with the same institutional experiences. As a consequence the whole population has to adapt to the new formal institutions. In the second case, where an individual moves into a different country with stable institutions, the emigrant interacts primarily with people who are already experienced with the prevailing formal institutions. One might therefore expect that

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in the latter (and for reforms less typical) case former informal rules become unimportant more quickly.

The second relevant paper, authored by Fuchs-Schündeln and Haliassos (2015), employs the earlier described natural experiment of German Division and Reunification to study whether product familiarity determines individual stock market participation. While the paper is thus not primarily concerned with institutional change, it nevertheless allows to draw some conclusions on this issue. The authors again employ survey data from the German Socio-Economic Panel and compare (among other issues) stock market participation of East and West Germans after German Reunification. They find that, after controlling for individual characteristics, participation rates among both groups of the German population quickly converged. However, as Osili and Paulson (2008), Fuchs-Schündeln and Haliassos (2015) focus exclusively on the extensive dimension of the participation decision.

3. Data and Descriptive Statistics

3.1. Data

Up to now, most of the empirical evidence in household finance is based on survey data. Surveys have the advantage of being capable of drawing a reasonably complete picture of household wealth as it is, in principle, possible to ask for each type of asset and liability separately and regardless of where the assets and liabilities are held. Moreover, surveys collect a wide range of socio-economic characteristics. However, this comes at the price of the well-known disadvantages of questionnaires such as problems of self-selection, non-response behavior, systematic misreporting, wishful thinking and lack of accuracy.[12] Survey participation itself might alter financial behavior, as the empirical evidence presented in Crossley et al. (2014) indicates. Two alternatives to survey data are register and account data. While the use of register data is appealing and has its obvious advantages, its access is mostly limited to the Scandinavian countries and Finland (von Gaudecker, 2015). In Germany, the only feasible alternative to survey data, whenever available, is bank account data.[13] While this sort of data typically exhibits high levels of validity, this comes at the price that account data often do not provide a complete picture of household wealth and socio-economic characteristics. For example, households may have accounts or hold assets at more than one bank.

In our analysis we make use of a unique dataset consisting of individual customer data from 11 German savings banks. Eight banks operate in East Germany, three in West Germany.[14] For both German regions (east and west) our sample includes small, respectively, mid-size and large banks from rural, mixed and urban areas. Table 1 provides a condensed overview on the characteristics of the banks and their main retail districts. The size of the banks is categorized as follows: banks with less than 100.000 customers are considered as "small", banks with more than 100.000 and less than 200.000 customers are labelled "medium" and banks with more than 200.000 customers are denoted as "large". Altogether, our sample is

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[12]For a discussion see Calvet et al. (2007).

[13]For an application of German brokerage and bank account data, see Hackethal et al. (2012).

[14]Since we control for potential socio-demographic differences between East and West German customers in our empirical analysis it is unproblematic that our data set contains more observations from East Germany.

Table 1: Characteristics of banks

Bank	Size	Location	Characteristics of retail district
1	Medium	East	Rural
2	Large	East	Mixed
3	Medium	East	Urban
4	Medium	East	Urban
5	Large	East	Mixed
6	Small	East	Urban
7	Small	East	Urban
8	Medium	East	Rural
9	Small	West	Urban
10	Small	West	Rural
11	Large	West	Mixed

reasonably representative for the German savings banks sector.[15]

For all 11 savings banks in our sample we have a complete record of all private customer accounts. All financial variables are recorded with their values as of 31th December 2006. We excluded corporate clients from the sample since corporations are, as mentioned earlier, well known to differ in their portfolio behavior. While the vast majority of accounts in our sample is belonging to individuals, there is a significant number of joint accounts, typically owned by (married) couples. Since our estimation model bases on individual data, we split up joint accounts by assigning assets and liabilities proportionally to (fictive) individual accounts.

Before conducting our empirical analysis we excluded various observations from the dataset. First, we are only interested in active customers which likely hold the major share of their financial wealth with their savings bank. We therefore excluded customers not owning a checking account or having zero asset wealth (621,683 observations). Second, we excluded all observations for which the age variable is either missing or likely misreported. We therefore deleted customers with unknown age or with a reported age of more than 100 years from the dataset (38,030 observations).[16] Third, we are only interested in individuals which can choose their bank portfolios freely. As there are legal restrictions for bank customers in the age of less than 18 years we dropped all observations of these young bank customers (71,386 observations). Fourth, as we are interested in comparing bank customers living in East and in West Germany we excluded observations who are either from Berlin (2,289 observations) or could not be attributed to a unique German district (NUTS-3) (2,652 observations). We exclude Berlin as individuals cannot be clearly attributed to either East or West Germany. Our final sample thus includes 1,774,475 observations. While 1,417,205 individuals live in East Germany, the remaining 357,270 customers live in West Germany.

Table 2 delivers an overview on the set of variables which is available for each bank customer. The table also provides a brief description of the variables. In addition to a detailed breakdown of customer

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[15]Due to confidentiality requirements and a nondisclosure-clause, we are not allowed to provide more detailed information about the savings banks in our sample. The data set only covers typical savings banks; Landesbanken are not included in the sample.

[16]While a small number of customers might in fact be older than 100 years, these observations most likely refer to deceased customers, which have not yet been deleted from the banks' databases.

Table 2: Description of Variables

Variable	Description
Socio-Demographics	
Male	Sex of customer is male, dummy
Transfer	Receives social transfer, dummy
Age	Age of customer at reference date, coded as dummies
$Area_{urban}$	Residence in predominantly urban living area, dummy
$Area_{mixed}$	Residence in intermediate living area, dummy
$Area_{rural}$	Residence in rural living area, dummy
East	Residence in East Germany (NUTS-3), dummy
Income, Liabilities and Wealth	
Income	Regular income (2006 €)
GFW	Gross financial wealth (2006 €)
$Liab_{zero}$	No liabilities, dummy
$Liab_{10,000}$	Less than 10,000 € liabilities, dummy
$Liab_{100,000}$	in between 10,000 and 100,000 € liabilities, dummy
$Liab_{high}$	More than 100,000 € liabilities, dummy
Assets	
Risky	Sum of all risky assets (2006 €)
$Risky_{ext}$	Stocks, bonds and externally managed mutual funds (2006 €)
$Risky_{int}$	Mutual funds issued and managed by savings bank (2006 €)

wealth into the bank's financial products,[17] we also have information on socio-demographic and regional characteristics.[18]

The first block of variables consists of socio-demographic information. First, we have information on a customer's gender. *Male* is a dummy for male bank customers. Second, we code the dummy variable *Transfer* for customers receiving social transfers (such as unemployment benefits). We also know the exact age of each bank customer. As our dataset contains a huge number of observations we code a dummy variable for each age class $m = 18, \ldots 84$. Older customers are summarized in an additional dummy. We also have information on the living place of bank customers. The variables $Area_{urban}$, $Area_{mixed}$ and $Area_{rural}$ are dummy variables for customers living in predominantly urban, mixed and predominantly rural areas.[19] We also code a dummy variable *East* for bank customers living in East Germany.

The second block of variables refers to income, liabilities and wealth. *Income* measures customers' regular income, which was derived via automatically detected repeated income streams from individual bank account transaction data. Gross financial wealth, *GFW*, is the sum of sight deposits, time deposits, savings deposits and the sum of all risky assets a bank customer holds with his or her savings bank. We also have information on bank customers total liabilities, i.e. the sum of all loans and the utilized credit line. As

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[17]All financial variables are expressed in Euro of year 2006.

[18]The data was provided by each bank separately. For some banks, even more detailed data on customer accounts was available. However, we had to use the data on the aggregation level which was available for all sample banks. In particular, no consistent information on maturities was available.

[19]We follow the classification of Eurostat (2007) when classifying areas of residence.

the distribution of liabilities is highly right-skewed, we use dummy variables for different liability-classes in our subsequent estimations. In order to do so we create categorical variables, indicating liabilities of zero ($Liab_{zero}$), one to 10,000 ($Liab_{10,000}$), 10,001 to 100,000 ($Liab_{100,000}$) and more ($Liab_{high}$). We thereby account for the high number of zero liabilities and differences between comparatively small consumer and comparatively high housing loans.

Finally, the third block of variables delivers some information on risky assets, individuals hold in their portfolios. In general, investors which are willing to hold risky assets can either decide to follow a passive or an active investment strategy. A comparatively passive investment strategy consists of buying mutual funds. The strategy to buy mutual funds is often driven by the motive to profit from the (at least in the long-run) above-average stock- and bond returns by investing in a highly diversified portfolio. Instead of making own investment decisions, the detailed investment strategy is made by the mutual fund manager.[20] As a consequence, the option to buy mutual funds is attractive even for investors with low degrees of capital market experience, no specific informational advantages and investors with low degrees of confidence in their own abilities to judge on good investments. An active investment strategy consists of buying and selling securities based on own judgments of their expected yield. One might expect that following such a strategy requires a significant deal of financial literacy, experience, information and especially self-reliance.

To some extent, our data allows us distinguishing between the two described investment strategies. First, for every bank customer we have the amount of wealth held in mutual funds, issued and managed by DEKA Bank ($Risky_{int}$), an institution owned by German savings banks themselves. While bank customers holding this type of asset clearly make an active decision to invest in somewhat risky assets, they nevertheless remain comparatively passive in their investment decision by delegating the choice of their portfolio to the fund manager. As the fund manager is belonging to the savings bank company, one might expect that the level of trust in the fund exceeds the one in externally managed funds. Second, we have information on the amount of risky assets ($Risky_{ext}$) a bank customer holds in the form of stocks, bonds and derivatives. The amount held in the form of these "risky external assets" is a proxy for customers' willingness to adopt an active investment strategy. The variable $Risky_{ext}$ also contains externally managed mutual funds.[21] For those banks where the information is available,[22] these account for roughly 20% of the external risky assets. Thus, $Risky_{ext}$ is still a valid proxy for bank customers' willingness to take an active role in portfolio investment decisions.

3.2. Descriptive Statistics

Table 3 displays some descriptive statistics on the employed dataset. Column 3 reports population-weighted values for Germany, columns 4 and 5 report values for West and East Germany.

The majority of savings bank customers is female (55%). While about 45% of the savings bank customers living in East Germany are male, the share of male customers is slightly higher in West Germany

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[20]Often mutual funds aim at reproducing stock market indices and thus deliver the average market yield.

[21]We should expect that bank customers buying externally managed mutual funds in general exhibit higher levels of trust in financial market participants (here: fund managers) as these managers do not belong to the savings bank company.

[22]The exact share is available for only two banks in our sample. As a consequence there is no way of disentangling externally managed mutual funds from stocks, bonds and derivatives in a systematic way.

Table 3: Descriptive Statistics

		Germany	West	East
Socio-Demographics				
Male	*%*	0.47	0.48	0.45
Transfer	*%*	0.04	0.02	0.11
Age	in years	49.95	49.39	52.16
$Area_{urban}$	*%*	0.60	0.71	0.17
$Area_{mixed}$	*%*	0.39	0.28	0.83
$Area_{rural}$	*%*	0.01	0.01	0.00
Income, Wealth (cond. on participation) and Liabilities				
Income	in €	1,164	1,169	1,145
$Liab_{10,000}$	*%*	0.14	0.14	0.16
$Liab_{100,000}$	*%*	0.08	0.09	0.03
$Liab_{high}$	*%*	0.02	0.02	0.00
GFW	in €	17,009	17,931	13,370
Asset Participation Rate				
Risky (>0)	*%*	0.19	0.19	0.20
$Risky_{int}$ (>0)	*%*	0.12	0.11	0.14
$Risky_{ext}$ (>0)	*%*	0.10	0.11	0.08
Assets (cond. on participation)				
Risky	in €	28,529	32,323	13,556
$Risky_{int}$	in €	11,463	11,866	9,873
$Risky_{ext}$	in €	38,388	44,376	14,764
Observations		1,774,475	357,270	1,417,205

Financial variables reported in € of year 2006.

(48%). Only 2% of West German savings bank customers receive social transfers while this holds true for 11% in East Germany. This comparatively large difference is primarily (although not completely) due to the differences in unemployment rates in the two parts of Germany. On average, West German savings bank customers are roughly three years younger than their East German counterparts.[23] There are comparatively large differences in terms of urbanity of living areas of East and West German savings bank customers. While 71% of the West German customers live in predominantly urban districts, this holds true for only 17% of their East German counterparts. While the least of all East and West German customers live in predominantly rural areas, most East German customers reside in districts of intermediate urbanity (83%).

Average income is roughly the same in East and West Germany (for those customers, earning a regular income). However, West Germans hold more often debt with their savings bank than their East German counterparts. This holds true especially for loans in between 10,000 and 100,00 €. Gross financial wealth turns out to be higher in West Germany (17,931 € as compared to 13,370 € in East Germany).

For total risky assets we find little difference in participation rates between East (20%) and West German

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[23]Note that we excluded customers in the age of less than 18 from the sample, thereby increasing average customer age in the dataset.

bank customers (19%). However, whenever West Germans hold risky assets at all, the amount they invest in this asset (32,323 €) is more than twice as large as East Germans' risky investments (13,556 €). When studying the composition of risky asset holdings we find additional differences between East and West German bank customers. East Germans have a much higher participation rate in internal risky assets than their West German counterparts (14% versus 11%). Conditional on holding risky internal assets at all, West Germans hold slightly higher amounts of this asset type. For risky external assets we find higher participation rates among West Germans (11% versus 8%). Moreover, conditional on holding risky external assets at all, West Germans hold much higher amounts of risky external assets (44,376 € as compared to 14,764 € among East Germans).

Figure 1 delivers plots of the empirical cumulative distribution functions of total, internal and external risky assets, conditional on participation in the respective asset class. W show all percentiles from 1 to 99. The gray (black) curve and vertical line represent the East (West) German cumulative distribution function and the sample mean, respectively. The vertical lines resemble the conditional means reported in Table 3. Up to the 40-percent-quantile we find little differences between East and West Germans for total risky assets. However, for higher quantiles West Germans hold systematically more risky assets. Moreover, the difference tends to increase in the quantiles of the distribution. As the figure also reveals, the effect for total risky assets is primarily due to differences in external risky asset holdings.

Our preliminary descriptive analysis allows us drawing several conclusions. First, the stockholding puzzle seems not to be an artifact of survey research. Even when using German real world bank customer data, only a comparatively small fraction of all bank customers holds risky assets. Second, while the percentage of bank customers holding some sort of risky asset in his or her portfolio is similar in East and West Germany, the composition of risky assets seems to differ. Savings bank customers living in West Germany more often hold external mutual funds, stocks and bonds. They also tend to hold much more wealth in these assets. However, the samples of bank customers living in East and West Germany strongly differ in some of their properties. Customers living in the western part of Germany exhibit higher gross wealth than their East German counterparts, and, on average, they are younger and less likely to receive social transfers or to live in rural districts. Thus, a purely descriptive analysis is incapable of answering the question whether the observed differences in investment behavior are driven by different sample characteristics or in fact by differing preferences. In order to answer this question we proceed with a more advanced empirical analysis in the following subsections.

4. The Decision to Hold Risky Assets at the Extensive Margin

In our empirical analysis we start out with studying the decision to hold risky assets at the extensive margin. In order to do so we construct a dummy variable for the participation in the risky asset market:

$$P(Risky)_i = \left\{ \begin{array}{ccl} 1 & : & Risky > 0 \\ 0 & : & else \end{array} \right\} \tag{1}$$

Following the same procedure we construct participation dummies for risky internal and risky external assets.

Risky Assets

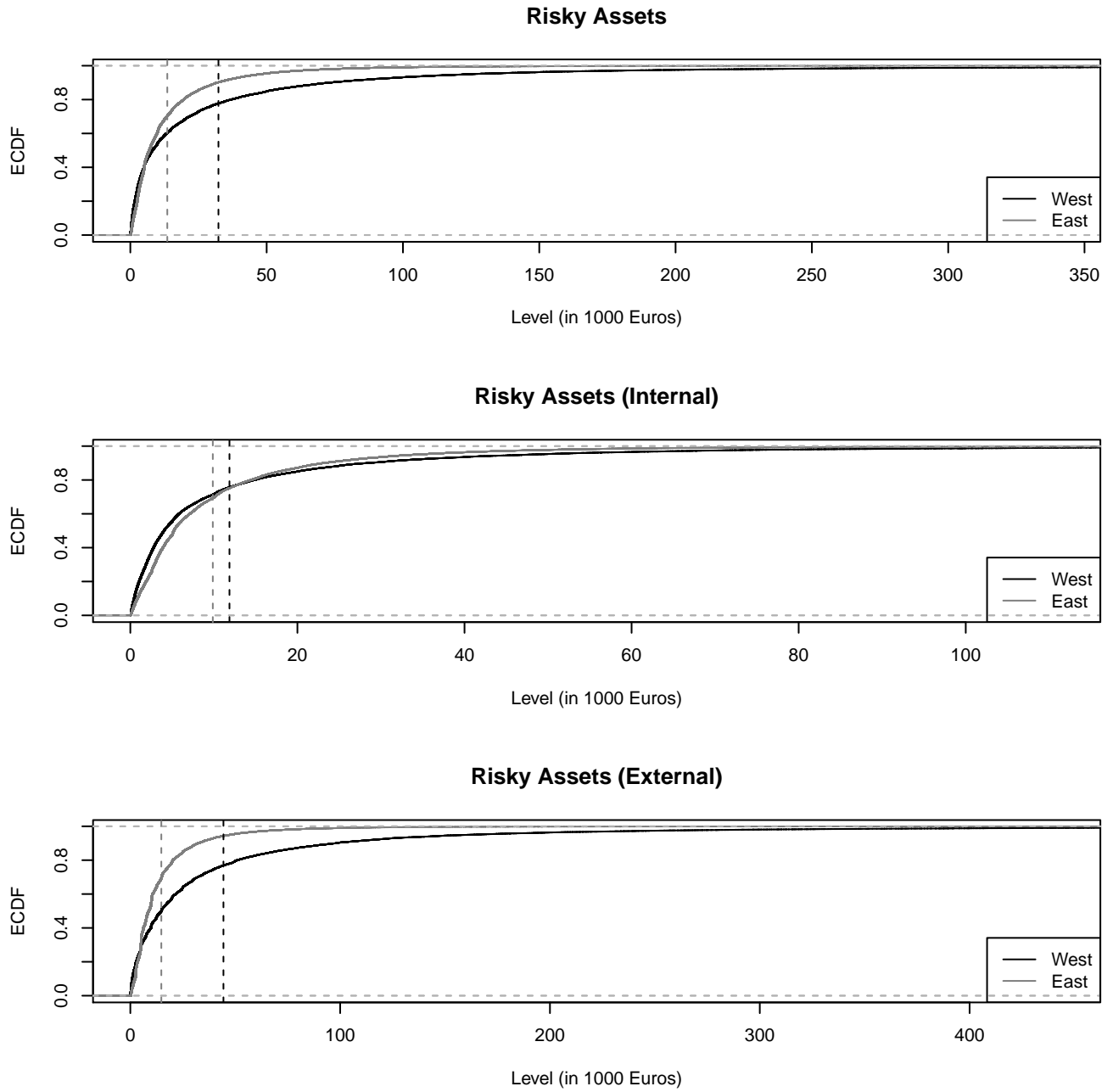**Risky Assets (Internal)**

Risky Assets (External)

Figure 1: Empirical Cumulative Distribution (Conditional on Ownership)

We then regress the three constructed dummy variables on a number of control variables within a logit estimation approach and estimate the model with the maximum likelihood technique. The choice of our control variables follows the earlier summarized literature and data availability. First, we control for the socio-demographic issues gender ($Male$), employment/social status ($Transfer$), age (age dummies)[24] and the characteristics of the living area ($Area_{mixed}$, $Area_{rural}$, reference group: $Area_{urban}$). We also control for income ($Income$) and gross financial wealth (GFW).[25] As usual in the literature, both variables enter the regression equation in logarithms. Finally we control for liabilities ($Liab_{10,000}$, $Liab_{100,000}$, $Liab_{high}$, reference group: $Liab_{zero}$).[26]

As discussed in the introduction, at least the elderly East Germans have lived under completely different institutions than the West Germans for almost 40 years. It is thus interesting to study whether the differences in institutions have left their traces in bank customers' portfolio behavior. In order to study this question we add a dummy variable for East Germans ($East$) to our regressions. Somewhat problematic, we have no information on the place of birth of bank customers and we also do not know in which of part of Germany the customers have been living throughout the period of German division. As comparable studies such as the one by Fuchs-Schündeln and Masella (2015) one the effects of socialist education we thus cannot rule out that a significant share of bank customers living nowadays in East Germany is originally from West Germany and has moved to East Germany (and the other way round). Moreover, the younger bank customers have lived under the same institutional circumstances in reunified Germany. While it is well possible that their portfolio behavior is shaped or at least influenced by the experiences of their families and friends, which they collected in the earlier existing systems, one might nevertheless expect that the own experiences made under the institutions in reunified Germany nowadays play the predominant role. Thus, even when the formerly differing institutions in the two parts of Germany had an influence on portfolio behavior it might be hard to disentangle them in our data. However, when we in fact find differences in between bank customers living in East and West Germany this might be interpreted as a very strong indication for the existence, strength and persistence of these effects.

The estimation results are summarized in Table 4. The results for any sort of risky asset are reported in column (1), those for risky internal assets are shown in column (2) and the findings for risky external assets in column (3). In order to get an impression of the strength of the effects we report marginal effects for an individual with mean/median characteristics. We also report regionally clustered standard errors and significance levels.

Altogether, our estimations deliver plausible coefficients for the control variables. We find male bank customers in general to exhibit a significantly higher probability to hold risky assets than their female coun-

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[24]The large number of available observations allows us employing the earlier mentioned dummy approach. As discussed earlier, in order to disentangle age and cohort effects, we implicitly assume the absence of cohort effects, see Ameriks and Zeldes (2004) and Campbell (2006).

[25]As the left hand variable refers to one asset class included in gross financial wealth, we correct gross financial wealth in each regression for the asset class the left hand variable belongs to. Thus, GFW differs in between estimations for different asset classes.

[26]In order to control for unobserved bank heterogeneity one could consider to include bank fixed effects. However, as each bank is located either in East or West Germany, the resulting identification of the East coefficient would rely on "moving" customers whose bank and residence are in West (East) and East (West) Germany, respectively. We therefore refrain from including bank fixed effects.

Table 4: Participation Decision in Risky Assets (Logit Regressions)

	(1) $Risky$ Coef./(SE)/[dydx]	(2) $Risky_{int}$ Coef./(SE)/[dydx]	(3) $Risky_{ext}$ Coef./(SE)/[dydx]	(4) $Risky$ Coef./(SE)/[dydx]	(5) $Risky_{int}$ Coef./(SE)/[dydx]	(6) $Risky_{ext}$ Coef./(SE)/[dydx]
$Male$	0.121***	0.094***	0.175***	0.119***	0.090***	0.176***
	(0.012)	(0.010)	(0.026)	(0.012)	(0.011)	(0.026)
	[0.017]	[0.010]	[0.008]	[0.017]	[0.009]	[0.008]
$Transfer$	-0.860***	-0.828***	-0.616***	-0.859***	-0.824***	-0.614***
	(0.075)	(0.079)	(0.064)	(0.075)	(0.079)	(0.064)
	[-0.095]	[-0.067]	[-0.023]	[-0.095]	[-0.066]	[-0.023]
$Age\ dummies$	yes	yes	yes	yes	yes	yes
$Area_{mixed}$	0.057	0.233***	-0.294**	0.004	0.097**	-0.253**
	(0.048)	(0.074)	(0.132)	(0.039)	(0.044)	(0.124)
	[0.008]	[0.023]	[-0.015]	[0.001]	[0.010]	[-0.013]
$Area_{rural}$	0.043	0.240***	-0.329***	-0.052	-0.006	-0.256**
	(0.056)	(0.072)	(0.104)	(0.077)	(0.089)	(0.123)
	[0.006]	[0.024]	[-0.016]	[-0.007]	[-0.001]	[-0.013]
$log\ Income$	0.061***	0.077***	0.002	0.061***	0.078***	0.001
	(0.013)	(0.012)	(0.015)	(0.013)	(0.012)	(0.015)
	[0.008]	[0.008]	[0.000]	[0.009]	[0.008]	[0.000]
$Liab_{10,000}$	0.181***	0.077	0.399**	0.177***	0.067	0.403**
	(0.038)	(0.103)	(0.166)	(0.032)	(0.096)	(0.166)
	[0.026]	[0.008]	[0.021]	[0.025]	[0.007]	[0.021]
$Liab_{100,000}$	0.428***	0.428***	0.329***	0.423***	0.416***	0.332***
	(0.041)	(0.037)	(0.056)	(0.039)	(0.032)	(0.055)
	[0.067]	[0.051]	[0.017]	[0.066]	[0.050]	[0.017]
$Liab_{high}$	0.590***	0.281***	0.683***	0.590***	0.283***	0.683***
	(0.067)	(0.056)	(0.057)	(0.067)	(0.057)	(0.057)
	[0.096]	[0.032]	[0.041]	[0.096]	[0.032]	[0.041]
$log\ GFW$	0.292***	0.261***	0.544***	0.292***	0.262***	0.544***
	(0.018)	(0.016)	(0.014)	(0.018)	(0.016)	(0.014)
	[0.041]	[0.027]	[0.026]	[0.041]	[0.027]	[0.026]
$Wealth_{RE}$				0.000*	0.001***	-0.000
				(0.000)	(0.000)	(0.000)
				[0.000]	[0.000]	[-0.000]
$East$	0.024	0.232***	-0.214*	0.141	0.533***	-0.306*
	(0.036)	(0.065)	(0.125)	(0.089)	(0.119)	(0.180)
	[0.003]	[0.023]	[-0.011]	[0.019]	[0.049]	[-0.016]
N	1,774,475	1,774,475	1,774,475	1,774,475	1,774,475	1,774,475
AIC	1,618,908.9	1,335,915.0	907,363.9	1,618,577.4	1,334,205.8	907,267.0
Pseudo R^2	0.074	0.061	0.144	0.074	0.062	0.144

We report marginal effects at the mean. Standard errors (clustered on the NUTS III level) in parentheses.

Age dummies included, but not reported.

Gross financial wealth (GFW) excludes the risky asset class belonging to the left hand variable.

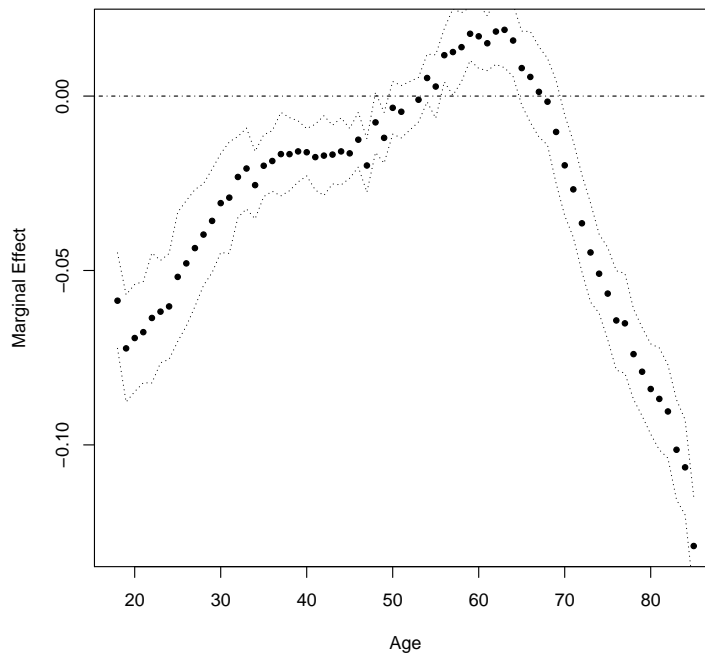* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 2: Marginal Age Effects (*Risky*)

terparts. Customers receiving social transfers have a significantly lower likelihood to hold risky assets. The marginal effect of age on the decision to hold risky assets (relative to a bank customer in the age of 52 years) is shown in Figure 2. The effect of age follows an inversely u-shaped pattern. We refrain from reporting the marginal age effects for every estimation shown in Table 4.[27] However, the pattern is very similar for all estimations. Customers living in mixed or in rural districts in general turn out to have a slightly higher probability of holding any sort of risky assets. While this also holds true for risky internal funds, the opposite result applies for risky external assets. Income is positively related to total risky asset participation. However, the log-linear relationship is only found to be significant for internal risky assets. The likelihood to hold risky assets is higher whenever bank customers also hold liabilities with their bank. As expected, we find gross financial wealth to increase the likelihood to hold any type of risky assets.

When comparing our estimation results for the set of employed control variables to those found in the previous empirical literature, either based on administrative (Calvet et al., 2007) or survey data (e.g. Guiso et al., 2008), our results turn out to be qualitatively similar. Nagelkerke's Pseudo R-Square measure indicates a satisfactory explanatory power of the described logit estimations. Interestingly enough, the regressions explaining participation in the market for risky external assets turns turn out to have much more explanatory power than those for risky internal assets.

For total risky assets, the coefficient of the East dummy turns out to be positive, but the marginal effect is

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[27]The figure shows the marginal effects for model (1) reported in Table 4.

very small and statistically insignificant. However, as the results for internal and external risky assets show, there is an adverse effect for risky internal and risky external assets. While East German bank customers are more likely holding risky internal assets (+2.3 percentage points), they less likely hold risky external assets (-1.1 percentage points). In the light of the fact that both types of assets are only held by roughly ten percent of all savings bank customers, these effects are not only statistically but also economically significant.

One might argue that the fact that we do not have complete information on bank customers' wealth could have an influence on the results. Especially the omission of indicators of real estate wealth might be problematic. East and West German bank customers might differ in the likelihood to own real estate, and, even more severe, real estate prices might differ systematically. In order to get an impression whether our results are affected by this problem we construct an indicator of regional real estate wealth $Wealth_{RE}$ by multiplying regional home ownership rates and regional real estate prices and add this indicator to our estimation equations.[28] The referring estimation results are shown in columns (4), (5) and (6) of Table 4. In fact, the inclusion of the real estate wealth variable turns out to have some effect on the estimation results. For total risky assets, the estimated coefficient for the East dummy increases, but remains insignificant. For risky internal assets the coefficient of the East dummy increases strongly and remains to be highly significant. For risky external assets the coefficient of the East dummy becomes more negative and again remains significant. Thus, the inclusion of a control variable for regional real estate wealth delivers the same qualitative results but generates even more pronounced differences between East and West German bank customers.

Altogether, we conclude that East and West German bank customers do not differ systematically in their decision to hold any sort of risky asset, a finding which is in line with the results reported in Fuchs-Schündeln and Haliassos (2015). However, our disaggregated analysis detects systematic and economically meaningful differences between East and West German bank customers with respect to their willingness to hold risky internal and risky external assets. While East Germans exhibit a tendency to invest into funds issued and managed by their own savings bank, West Germans rely more often on externally managed funds and direct holdings of bonds and stocks.

As explained earlier, we have no information where the bank customers in our dataset lived before German Reunification. Lacking this information, we assumed that the current living place was also the living place before German Reunification. Obviously this assumption does not hold true as after German Reunification migration between East and West Germany took place. Thus, our dataset of East German bank customers likely also includes some individuals from West Germany and the other way round. One might suspect that as a consequence existing differences between East and West Germans are harder to identify in our somewhat mixed up dataset. When we follow this line of argument, the true differences between East and West Germans might be even larger. However, we might also suspect that especially individuals with low levels of risk aversion decided to migrate. Again, this would be unproblematic when the share of the population which migrated in both directions would have been similar. However, in the first years

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[28]Regional home ownership rates were taken from the 2011 Mikrozensus, regional house prices were provided by the Bulwiengesa company on request.

after German Reunification much more East Germans moved to West Germany than the other way round. Thus, our results might be driven by the fact that as a consequence of East-West migration the share of bank customers with low levels of risk aversion has increased in West Germany. The data shown in Table 5 indicates that this is unlikely to be the case. Normally, bank customers have their bank account with a savings bank which is close to the bank customers living place. Bank customers living in West Germany but holding a bank account with an East German savings bank likely moved some time in the past from East to West Germany (see column (3) in Table 5). Comparing the portfolios of these bank customers with those of East German bank customers which also live in East Germany (column (2) in Table 5) allows us judging whether our results are in fact likely driven by those bank customers which moved from East to West Germany. When comparing movers to stayers we find that movers less likely hold risky internal and risky external assets. And even conditional on holding risky assets at all, the amount held in either risky internal or risky external assets is at least similar. In the light of these findings it is at least unlikely that our results are in fact driven by East-West migration.

Table 5: Asset Market Participation of East German Bank Customers living in East and West Germany

	(1)	(2)	(3)
Bank location	East	East	East
Living place	East or West	East	West
	Mean	Mean	Mean
$Risky$	0.20	0.20	0.16
$Risky_{int}$	0.14	0.14	0.13
$Risky_{ext}$	0.08	0.08	0.05
$Risky(>0)$	13,560	13,552	12,176
$Risky_{int}(>0)$	9,873	9,873	7,866
$Risky_{ext}(>0)$	14,764	14,749	18,912
N	1,417,205	1,416,869	15,099

5. The Decision to Hold Risky Assets at the Intensive Margin

5.1. Estimation Strategy

Most of the existing literature analyzing the demand for risky assets focuses on the share of risky assets in total assets (e.g. Guiso et al., 1996, Heaton and Lucas, 2000, Guiso et al., 2004, Ameriks and Zeldes, 2004, Cocco, 2005, Cocco et al., 2005, Calvet and Sodini, 2014). However, if the available data does not allow to draw a complete picture of individual wealth (as it is often true for bank account data) it is more reasonable to use the level of risky assets as explanatory variable. A prominent example for this approach is Perraudin and Sørensen (2000). As outlined earlier, our bank dataset likely draws an incomplete picture on individual wealth. We therefore follow the latter described strategy and study the level of risky asset holdings rather than asset shares.

As a consequence of the earlier described stockholding puzzle, a large share of bank customers in our dataset does not hold any risky asset at all. Thus, we deal with a heavily censored dataset. Moreover,

one might expect that the effect of the control variables on risky asset demand is non-linear. To tackle these problems adequately, Miniaci and Weber (2002) have proposed to use censored quantile regressions to estimate determinants of risky asset demand.[29] In the subsequent empirical analysis, we start out with estimating conditional linear regression models. In order to account for possible non-linearities we then proceed with censored quantile regressions. As it is usual in the related literature, we make use of the same set of control variables as in the analysis of the extensive decision to hold risky assets.

5.2. Conditional Ordinary Least Squares Estimations

In a first step of our analysis, we estimate conditional OLS regressions to explain risky asset holdings. In order to do so, we drop all bank customers from the dataset, not holding the risky asset under consideration at all. The estimation results are shown in Table 6. The first column shows the results for any type of risky asset. The second column contains the results for risky internal assets, the third for risky external assets.

Many of the employed control variables turn out to be insignificant in the estimation aiming at explaining total risky asset holdings. An inspection of columns (2) and (3) indicates that this finding is likely the consequence of the fact that the determinants of risky internal and external asset holdings differ to quite some extend.[30] For only three control variables we find the same systematic influence on holdings of risky internal and external assets. More wealthy individuals tend to hold more risky internal and external assets. Highly indebted bank customers, i.e. bank customers with debt of more than 100,000 €, also tend to hold more risky assets. This finding sounds peculiar at first sight. However, quite likely the highly indebted bank customers use the credit to finance real estate, a sort of wealth we do not have more precise information on. For debtors in the range of in between 10,000 and 100,000 €, we find the opposite effect. These bank customers tend to hold less risky internal and external assets.

For our variable of central interest, the East dummy, we find a negative coefficient in all three regressions. However, the estimated coefficient is comparatively small and turns out to be insignificant for internal risky assets. We find a huge and highly significant effect for risky external assets. On average, a West German bank customer holding risky external assets at all, holds roughly 27,000 € more of this asset type than his or her East German counterpart.

In order to test the stability of the reported results we repeat the estimations under the inclusion of the earlier described real estate wealth variable. The results under inclusion of $Wealth_{RE}$ are reported in columns (4), (5) and (6) of Table 6. The estimation results remain qualitatively unaffected.

5.3. Censored Quantile Regressions

Parametric models as e.g. ordinary least square estimations capture the effect on the conditional mean of a dependent variable. However, this comes at the price of failing to capture the effects in different parts of the conditional distribution. Intuitively, it seems plausible that individuals with a high level of asset demand might react differently to changes in the control variables than individuals holding less of the referring asset.

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[29]For applications of this method in the household finance context see Hochguertel (2003) and Guiso et al. (1996).

[30]Note that the explanatory power (in terms of adj. R squared) of the regression explaining total risky asset holdings is lower than the one of the two regressions explaining risky internal or risky external asset holdings.

Table 6: Risky Asset Holdings (Conditional OLS)

	(1) Risky	(2) $Risky_{int}$	(3) $Risky_{ext}$	(4) Risky	(5) $Risky_{int}$	(6) $Risky_{ext}$
Constant	-799.35	-2,084.98	-20,766.27	-2,294.50	-3,048.00	-20,105.06
	(12,629.71)	(2,156.04)	(28,023.25)	(13,708.44)	(2,657.40)	(29,436.74)
Male	575.51	664.49***	-336.19	567.04	658.19***	-332.31
	(391.67)	(166.59)	(556.87)	(396.97)	(169.65)	(563.65)
Transfer	-123.43	-587.81*	515.05	-161.38	-609.03*	542.21
	(1,229.82)	(325.79)	(1,429.26)	(1,205.38)	(328.80)	(1,376.75)
Age dummies	yes	yes	yes	yes	yes	yes
$Area_{mixed}$	-3,048.98***	-361.96	-3,039.32***	-3,432.48***	-619.24	-2,872.72***
	(512.64)	(1,593.27)	(947.15)	(324.76)	(1,593.36)	(986.72)
$Area_{rural}$	-1,547.30	1,729.54	3,758.10	-2,204.23	1,290.10	4,034.27
	(2,635.74)	(1,651.70)	(5,132.32)	(2,308.86)	(1,528.20)	(4,866.42)
log Income	129.76	-206.76**	150.17	133.62	-204.37**	146.99
	(519.03)	(93.49)	(1,013.26)	(521.37)	(92.38)	(1,018.61)
$Liab_{10,000}$	193.02	-1,195.34***	1,281.04*	178.57	-1,200.59***	1,296.12**
	(486.38)	(418.47)	(669.21)	(470.24)	(410.76)	(645.91)
$Liab_{100,000}$	-3,151.00**	-1,988.51***	-3,705.94**	-3,163.23**	-1,998.54***	-3,704.29**
	(1,250.02)	(386.93)	(1,504.98)	(1,249.33)	(384.06)	(1,510.35)
$Liab_{high}$	48,296.40***	3,766.56***	74,556.20***	48,303.28***	3,764.68***	74,550.11***
	(11,115.40)	(887.48)	(13,180.67)	(11,117.97)	(884.92)	(13,197.60)
log GFW	3,240.79***	1,701.11***	5,834.09***	3,243.70***	1,701.31***	5,834.21***
	(810.55)	(120.47)	(1,877.04)	(812.33)	(120.59)	(1,876.89)
$Wealth_{RE}$				2.56	1.68	-1.14
				(2.42)	(1.43)	(3.50)
East	-16,680.02***	-2,236.36	-27,032.91***	-15,829.80***	-1,678.82	-27,412.67***
	(528.70)	(2,034.91)	(918.62)	(749.56)	(2,291.62)	(1,341.37)
N	344,855	244,242	156,761	344,855	244,242	156,761
AIC	8,789,442	5,487,347	4,107,709	8,789,441	5,487,328	4,107,711
Adj. R^2	0.022	0.071	0.024	0.022	0.071	0.024

Standard errors (clustered on the NUTS III level) in parentheses.

Age dummies included, but not reported.

Gross financial wealth (GFW) excludes the risky asset class belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

An adequate solution to estimate the effect on the entire distribution and to deal with possible heterogeneity and outliers is to employ quantile regressions.

The pioneering work of Koenker and Bassett (1978) incorporates a linear model into the minimization of the sum of absolute deviations. The latter can be used to calculate sample quantiles

$$Q_\tau(y_i|x_i) = x_i'\beta_\tau + e_i \tag{2}$$

with $i = 1, ..., n$ and $\tau = (0, 100)$. The parameter vector β is estimated separately for each conditional quantile. The minimization procedure concerns the piecewise linear absolute value function

$$\min_\beta \frac{1}{N} \left\{ \Sigma_{y_i \geq x_i'\beta_\tau} \tau \left| y_i - x_i'\beta_\tau \right| + \Sigma_{y_i < x_i'\beta_\tau} (1-\tau) \left| y_i - x_i'\beta_\tau \right| \right\} \tag{3}$$

which can be solved via linear programming (Koenker and Hallock, 2001) [31] The technique does not assume any specific error distribution. Furthermore, conditional quantiles are less prone to be affected by outliers.

As a consequence of the stockholding puzzle, our data on risky asset demand is heavily censored at zero. Powell (1984, 1986) proposes a robust way of dealing with censoring in the quantile regression context. He extends the standard quantile regression approach to the non-negative dependent variable case. The approach is again independent of the concrete error distribution. In order to obtain a unique solution, some weaker requirements have to be fulfilled. The regressors have to be non-collinear. Moreover, the conditional regression quantiles to be estimated have to contain a fraction of non-censored observations with sufficient informative variation. As Powell (1984) points out, large samples and at least the upper quantiles should meet these criteria.[32] The case of left-censored data is given by

$$Q_\tau(y_i|x_i) = \max \left\{ x_i'\beta_\tau + e_i, 0 \right\} \tag{4}$$

The maximum takes either the censored value of zero or a non-censored value.

The application of the described method includes the highly complex computation of non-differentiable and non-convex distance functions (Fitzenberger and Winkler, 2007). In this context multiple local optima can occur. As Fitzenberger (1997) points out, most algorithms perform quite poorly for high degrees of censoring in the context of this approach. As a consequence, we use a different approach of dealing with our high degree of censoring in this rich data environment. More precisely, we employ the three-step censored quantile regression approach proposed by Chernozhukov and Hong (2002). It is computationally less complex as the necessary steps include a parametric regression and the minimization problems to be solved are convex.

In a first step the censoring probability is estimated parametrically. As we have estimated this probability already in the first step of our analysis we can recur to the referring results (see Section 4). Only observations with a sufficiently small censoring probability are kept in the subsample (J_0). The uncensored subsample

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[31]For an overview on quantile regression algorithms and computational efficiency, see Fitzenberger (1997).

[32]Powell (1984, 1986) also shows under which circumstances the estimator is consistent and asymptotically normal. The presented method holds for fixed censoring, which is the case in our left-censored context.

J_0 is then used in the second step to run a standard quantile regression. The consistent estimates are used to predict the model with the initial complete sample. We then build a new subsample J_1 containing only predictions exceeding the censoring point. We therefore (asymptotically) select only observations which - conditional on the referring independent variables - deliver predictions above the censoring threshold. In the third step this subsample is used for an additional standard quantile regression. The now larger set of information increases the efficiency of the estimation.

The presented estimator by Chernozhukov and Hong (2002) is distributionally equivalent to the Powell (1986) approach. This means that the developed inference procedures hold for this method. It should be noted that the underlying probability model makes the model more restrictive, even though the model is allowed to be misspecified. Moreover, it keeps the main features of censored quantile regressions. The presented method has been successfully applied to different issues. Chernozhukov and Hong (2002) analyze the determinants of extramarital affairs, whereas Fack and Landais (2010) used it to study the impact of tax incentives on charitable giving. To the best of our knowledge, it has not been applied to the analysis of household asset demand yet.

In the following we apply the described three-step procedure to our cross-section of risky asset holdings. In the first step, we preserve the (unlikely) censored observations via our previously used logit specification.[33] The remaining steps follow the described process by Chernozhukov and Hong (2002). Throughout the procedure we use the same set of control variables, but decrease the dimension by approximating gross wealth by its logarithmic value. Furthermore the set of age dummies is replaced with a second order age polynomial.[34] Due to heavy censoring we concentrate our analysis on the quantiles in between 75% and 99%. Lower quantiles would induce singularity issues due to a degenerated design matrix.[35]

Due to the non-parametric nature of the applied estimation technique we report the estimation results in diagrams. On the vertical axis of the diagrams we report the estimated effect for the conditional quantile, the horizontal axis reports the referring conditional quantile. The dark solid curve is the connection of the distinct censored quantile regression estimates. The dashed lines report 95% confidence intervals which are based on asymptotic normality.

All employed control variables exhibit non-linearities. Thus, the employed estimation approach seems to be justified and turns out to be superior to simple OLS estimation. Due to space restrictions, we refrain from reporting the results for all control variables here,[36] but concentrate on the results for the East dummy.

The results for the East dummy are shown in Figure 3. In the upper part of the figure we show the

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[33] In order to construct a conservative sample we follow Chernozhukov and Hong (2002) and aim at excluding another ten percent of the subsample J_0. A similar procedure is applied in step 2. However, here the percentage of excluded observations has to be smaller.

[34] Gross wealth is the financial wealth aggregate less the risky assets under consideration. Due to single observations for individuals holding all wealth in the asset under consideration we conduct a sinus hyperbolicus transformation. Following this procedure is common in the literature (see e.g. Christelis, Georgarakos and Haliassos 2013) and helps avoiding matrix singularity for lower quantiles.

[35] Chernozhukov and Hong (2002) suggest the interior point algorithm by Portnoy and Koenker (1997). We use the algorithm provided in the "quantreg" R-package by Koenker (2015). Moreover, we bootstrap the standard errors via 200 replications of the implemented Markov Chain Marginal Bootstrap (MCMB) procedure (He and Hu, 2002).

[36] A complete documentation of the estimation results for the control variables can be found in the Appendix.

Risky Assets

Risky Assets (Internal)
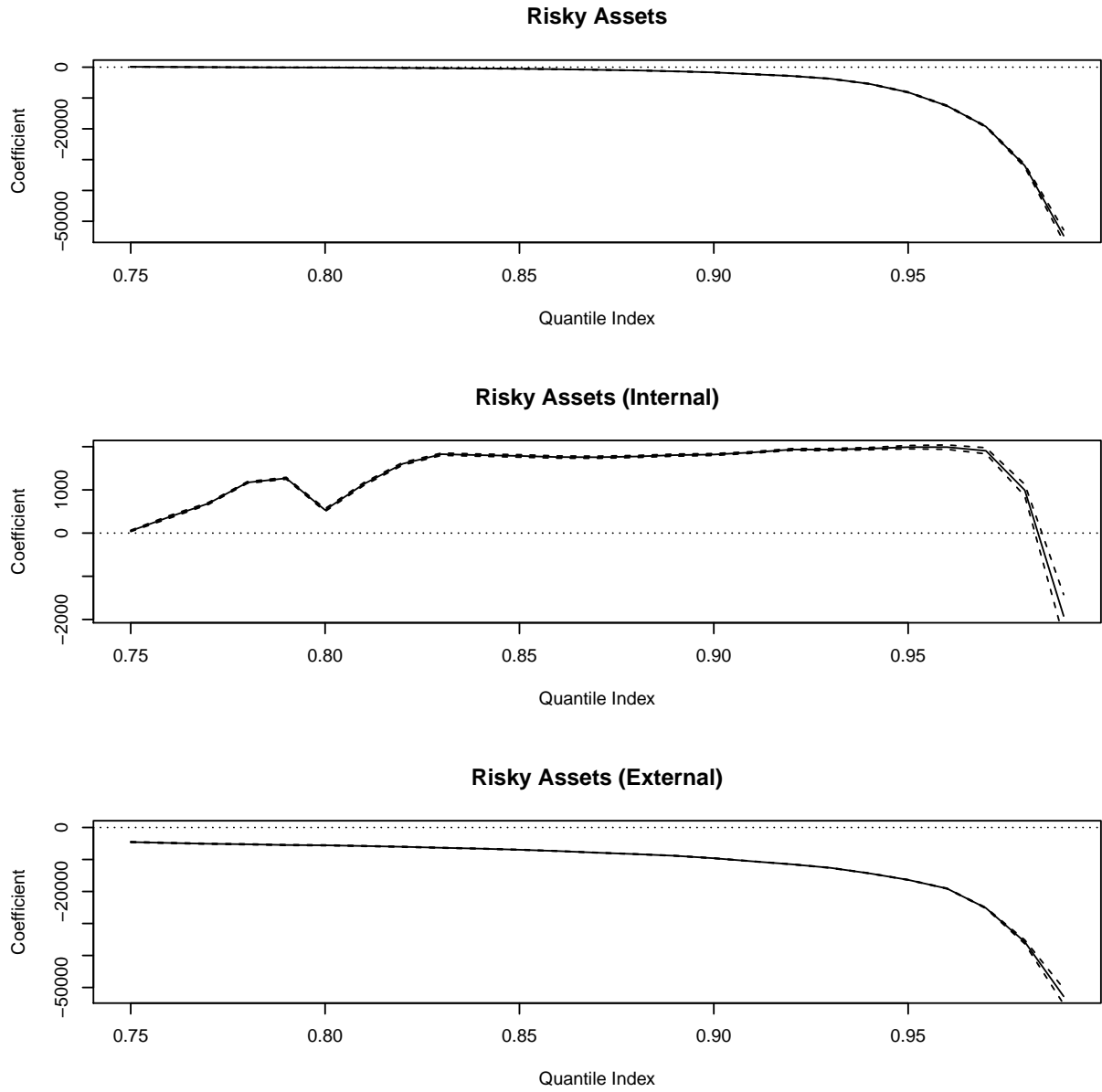

Risky Assets (External)

Figure 3: Effect of East Dummy on Risky Asset Holdings (Censored Quantile Regressions)

results for the regression explaining total risky asset holdings. The middle (lower) part of the figure reports the corresponding results for risky internal (external) assets. As depicted in the upper part of Figure 3 we find that, ceteris paribus, savings bank customers living in East Germany hold a systematically lower amount of risky assets. The effect is significantly negative for all displayed quantiles. While the effect is comparatively small for the conditional quantiles in between 75 and 90%, the effect increases strongly in the upper conditional quantiles and amounts to more than 50,000 € in the highest quantile. The middle part of Figure 3 indicates that East Germans tend to hold more risky internal assets for all displayed quantiles up to 98%. However, the effect is comparatively small and amounts to slightly less than 2,000 € at maximum in all conditional quantiles in between 75 and 97%. In the highest quantiles, we observe a reversal of the effect. Among the bank customers with the highest conditional risky internal asset holdings, West Germans tend to hold roughly 2,000 € more of these assets. The most pronounced difference between East and West German bank customers can be observed for risky internal assets (shown in the lower part of Figure 3). Even in the lowest displayed conditional quantile of 75% West Germans already hold almost 5,000 € more in risky external assets than their East German counterparts. The effect strongly increases over the conditional quantiles and amounts to roughly 50,000 € in the highest conditional quantile.

When repeating the estimation of the models under the inclusion of the real estate wealth variable $Wealth_{RE}$ the estimation results, which are shown in the Appendix, remain virtually unaffected.

6. Experience with and Learning about Institutions

Our previous empirical analysis revealed that 16 years after German Reunification, East and West German bank customers still exhibited systematic differences in their portfolio behavior. While the stockholding puzzle exists in both parts of Germany, in West Germany the willingness to take over risk and to manage these risks on one's own seems to be still more pronounced, a finding which is in line with the study about long-lasting impacts of macroeconomic experiences by Malmendier and Nagel (2011).

The full effect of institutional reforms will typically manifest the earlier, the more quickly the formerly acquired informal institutions fade out. The previously presented evidence indicates that even after a reform of institutions the former institutions have a comparatively long-lasting effect on portfolio behavior. However, to get an impression of how long-lasting the effects of former institutions are, additional empirical evidence is necessary. An obvious way of studying how quickly individuals adapt their portfolio choice behavior to new institutions is to track bank customers' behavior over time. However, due to the fact that our data consists of a cross-section only, this approach is infeasible, here. However, following the approach of Osili and Paulson (2008) we can study whether the individual experiences with the former institutions have an impact on portfolio choice. As explained earlier, in their study of U.S. immigrants Osili and Paulson (2008) found country-of-origin institutions to play a role especially among those immigrants which were old enough at the time of immigration to have collected their own experiences with their home-country institutions whereas no such effect could be detected for young immigrants.

In order to study whether experiences with the former communist institutions in fact play a decisive role in risky asset demand of East Germans we repeat the analysis of the extensive and the intensive decision to hold risky assets for two subgroups of individuals. The first group consists of people aged at least 18

years at time of German Reunification while the second group includes those which were younger than 18 years when Germany was reunified. As one might argue that the definition of age subgroups is somewhat arbitrary and even in the group of the elderly experiences with the former communist system differ to quite some extent, we in addition employ the approach of Alesina and Fuchs-Schündeln (2007) to include an interaction effect of age and the East dummy in our estimation equations.

6.1. The decision to hold risky assets at the extensive margin

Table 7 shows the estimation results for the decision to hold risky assets at the extensive margin. The table summarizes the estimation results of separate logit regressions for the two mutually exclusive subsamples of individuals in the age of below 18 (column (1)) and eighteen and older (column (2)) at the time of German Reunification. In the upper part of the table we display the results for total risky assets (*Risky*), in the middle those for risky internal assets (*Risky$_{int}$*) and in the lower part the findings for risky external assets (*Risky$_{ext}$*). We employ the same set of control variables as before. However, for reasons of clarity we only show the results for the East dummy as well as basic regression statistics.[37] The marginal effect is calculated relative to a benchmark individual of the referring group. Thus, median age and the benchmark individual naturally vary over the two subsamples.

For total risky assets we find no systematic differences between East and West German bank customers. For both age groups the coefficient of the East dummy is not significantly different from zero. For risky internal assets we find no difference between East and West Germans for those bank customers which were in the age of less than 18 at the time of German Reunification. However, there is a strong and highly significant positive effect for those bank customers in East Germany, which were 18 or older at the time of German Reunification. For risky external assets we find a significant negative effect for East German bank customers for both age groups. However, the effect turns out to be more pronounced in the group of people with experiences under the former communist system. While our findings for the decision to hold risky assets at the extensive margin is broadly in line with the findings of Osili and Paulson (2008), we also find differences between East and West Germans in the decision to hold risky external assets in the younger age group, at least for risky external assets.

When including an interaction effect between the East dummy and age rather than forming age groups, we end up with a qualitatively similar result. As it is shown in Table 8 the interaction term turns out to be insignificant for total risky assets. For risky internal assets we find a significantly positive interaction effect, indicating that older East German bank customers more likely hold this type of asset. For risky external assets we find the opposite effect; here, the coefficient of the interaction effect is significantly negative. Thus, the elder bank customers hold less risky external assets than the younger ones. As the older bank customers collected more experiences in the former socialist system, this is a clear indication that the observed difference between East and West German bank customers in fact is a consequence of the former institutional setting.

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[37]The complete results are available from the authors upon request.

Table 7: Participation Decision in Risky Assets for Age Classes (Logit Regressions)

	(1)	(2)
	Age<18	Age≥18
	Coef./(SE)/[dydx]	Coef./(SE)/[dydx]
	Total risky assets (*Risky*)	
East	-0.051	0.032
	(0.098)	(0.045)
	[-0.004]	[0.005]
N	403,203	1,371,272
AIC	268,062	1,348,385
Adj. R^2)	0.066	0.062
	Risky internal assets (*Risky$_{int}$*)	
East	0.008	0.281***
	(0.109)	(0.058)
	[0.001]	[0.030]
N	403,203	1,371,272
AIC	247,958	1,086,255
Adj. R^2	0.061	0.057
	Risky external assets (*Risky$_{ext}$*)	
East	-0.213**	-0.217*
	(0.089)	(0.131)
	[-0.002]	[-0.016]
N	403,203	1,371,272
AIC	73,467	833,173
Pseudo R^2	0.152	0.111

We report marginal effects at the mean.

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included, but not reported.

Gross financial wealth (*GFW*) excludes the risky asset class belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Participation Decision in Risky Assets with Age-East Interaction (Logit Regressions)

	(1) Total risky Assets $Risky$	(2) Risky internal assets $Risky_{int}$	(3) Risky external assets $Risky_{ext}$
Age	-0.001	-0.019***	0.010***
	(0.003)	(0.001)	(0.002)
East	0.197	-0.102	0.152
	(0.209)	(0.118)	(0.141)
Age · East	-0.003	0.006***	-0.006**
	(0.004)	(0.002)	(0.003)
N	1,774,475	1,774,475	1,774,475
AIC	1,646,797	1,353,811	928,759
Pseudo R^2	0.058	0.048	0.124

We report marginal effects at the mean.

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included, but not reported.

Gross financial wealth (GFW) excludes the risky asset class belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.2. *The decision to hold risky assets at the intensive margin*

We now turn to the decision to hold risky assets at the intensive margin. In a first step we repeat the conditional OLS regressions. In a first variant we again estimate the three regression for the two earlier defined age subsamples. The results are shown in Table 9. For total risky assets we find a significantly negative coefficient of the East dummy for both subsamples. However, the effect is much more pronounced among East German bank customers which were at least 18 at the time of German Reunification. The results for risky internal and risky external asset holdings indicate that the effect for total risky assets is almost exclusively the result of risky external asset holdings. For none of the two age classes we find a significant effect of the East dummy on risky internal asset holdings whereas East Germans hold significantly less risky external assets in both age groups. Again, the effect is much more pronounced in the group of East Germans with experiences in the former East German political system.

As a second variant of the conditional OLS we again include an interaction effect of age and the East dummy into the regressions. The results are shown in Table 10. The interaction effect turns out to be significantly negative for total risky assets, for risky internal and for risky external assets. Thus, on average every additional year of experience with the former communist system increases the differences between asset holdings of East and West German bank customers. However, the effect is much more pronounced for risky external assets.

In a second step of our analysis we repeat our censored quantile regression analysis. Again, we first follow the approach to estimate the censored quantile regressions for the two earlier defined age subsamples. The estimation results are visualized in Figure 4.

Basically, the light line describes the results for the subsample of East German bank customers which were in the age of less than 18 at the time of German Reunification whereas the dark line depicts the results

Table 9: Risky Asset Holdings for Age Classes (Conditional OLS)

	(1)	(2)
	Age<18	Age≥18
	Total risky assets (*Risky*)	
East	-3,631.56***	-19,001.97***
	(525.02)	(382.79)
N	46,161	298,694
AIC	1,245,378	7,384,189
Adj. R^2	0.006	0.047
	Risky internal assets ($Risky_{int}$)	
East	-279.71	-2,685.80
	(547.81)	(2,405.28)
N	40,771	203,471
AIC	858,384.52	4,599,297.93
Adj. R^2	0.074	0.060
	Risky external assets ($Risky_{ext}$)	
East	-12,297.37***	-28,279.85***
	(2,495.92)	(831.12)
N	9,040	147,721
AIC	258,532.10	3,730,148.24
Adj. R^2	0.015	0.053

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included, but not reported.

Gross financial wealth (*GFW*) excludes the risky asset class

belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Risky Asset Holdings with Age-East Interaction (Conditional OLS)

	(1)	(2)	(3)
	Total risky assets	Risky internal assets	Risky external assets
	Risky	$Risky_{int}$	$Risky_{ext}$
Age	849.66***	268.51***	808.61***
	(22.52)	(51.73)	(52.52)
East	24252.39***	6493.66***	18737.62***
	(2841.03)	(875.45)	(1836.44)
Age · East	-764.79***	-179.25***	-776.68***
	(42.41)	(52.67)	(25.43)
N	344,855	244,242	156,761
AIC	8,788,190	5,487,141	4,107,600
Adj. R^2	0.026	0.072	0.025

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included, but not reported.

Gross financial wealth (*GFW*) excludes the risky asset class

belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Risky Assets

Risky Assets (Internal)
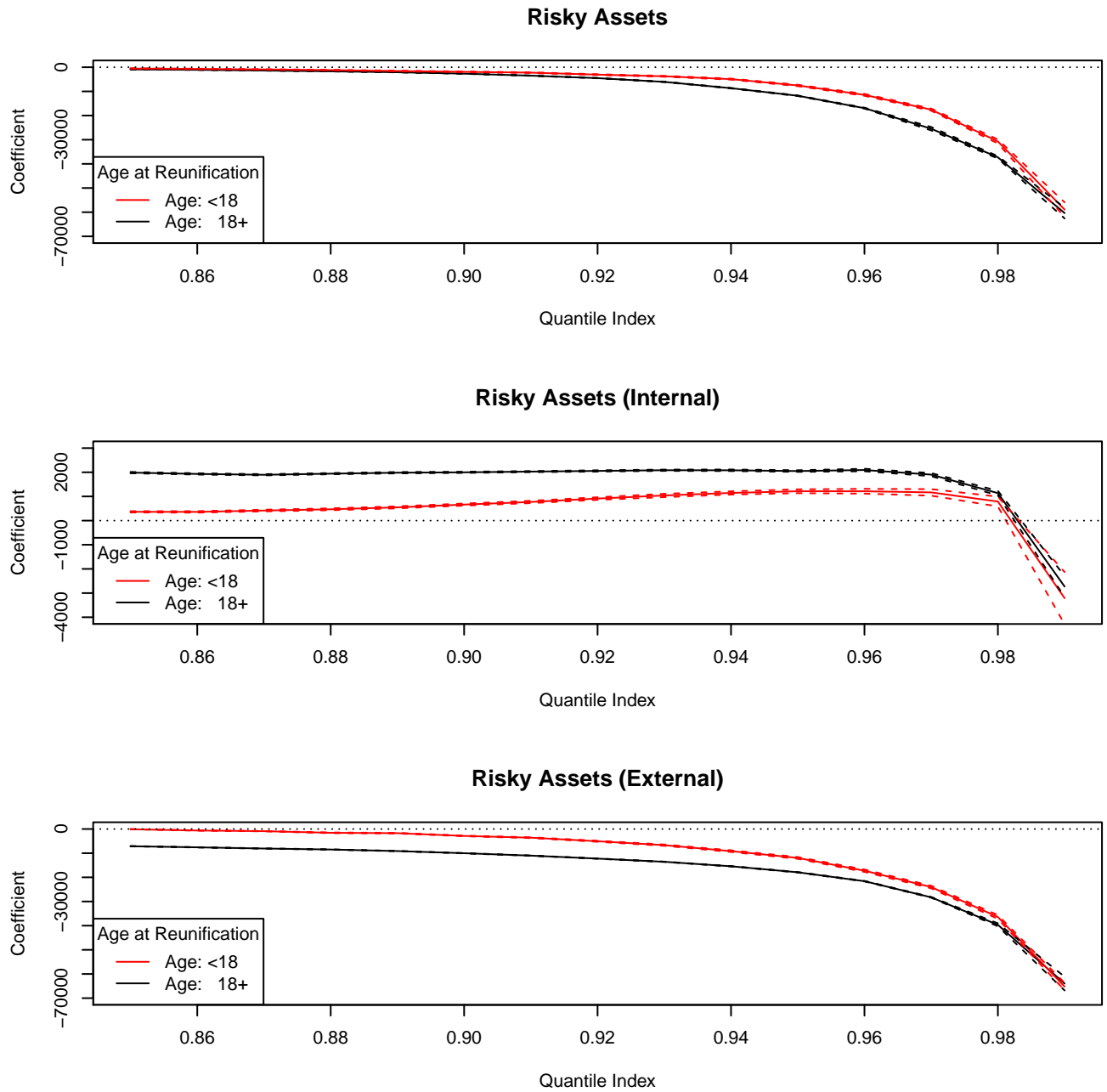

Risky Assets (External)

Figure 4: Effect of East Dummy on Risky Asset Holdings for Age Classes (Censored Quantile Regressions)

for the bank customers which have been at least 18 years old at that time. Basically, the results for both subgroups are similar. For both age groups of East Germans we find a strong and significant negative effect on total risky asset holdings, which increases in size over the conditional quantiles. However, the effect is more pronounced in the age group which is experienced with the former communist institutions. For risky internal assets we find a slightly positive effect of the East dummy for the conditional quantiles until 98%. In the highest conditional quantile, the effect reverses and becomes slightly negative. Again, the effect turns out to be more pronounced in the age group of experienced bank customers. Finally, for risky external assets we find strongly negative coefficients for the East dummy in both age groups, which further increase over the conditional quantiles. Again the effect is more pronounced in the group of bank customers which collected their own experiences with the former communist system.

We repeated all censored quantile regressions using the interaction approach. The results, which are shown in Figure 5, coincide with our earlier findings.

7. Discussion and Conclusions

Using bank account data of 11 eleven savings banks located in both East and West Germany we studied whether the strong institutional differences between East and West during the time of German division are still visible in portfolio behavior of savings bank customers 16 years after German Reunification. Besides supporting evidence for the well-known stockholding puzzle we end up with the following major results.

First, the decision to hold risky assets at the extensive margin is not influenced by the institutional past when considering total risky assets. Thus, the likelihood that two savings bank customers in East and West Germany hold any sort of risky asset is roughly the same. This result is in line with the analysis of Fuchs-Schündeln and Haliassos (2015), derived from survey data. However, we find a comparatively strong composition effect. While East German bank customers have a significantly larger probability to hold risky internal assets (e.g. mutual funds that are managed by their own bank), the opposite holds true for risky external assets (e.g. stocks, derivatives and externally managed mutual funds). As the Oaxaca-Blinder-Decompositions reported in Table 11 indicate, the observed differences between East and West German bank customers in the likelihood to hold risky internal and risky external assets cannot primarily be explained by the prevailing differences in the socio-demographic characteristics.

Second, we find pronounced differences in the decision, how many assets a bank customer holds (i.e. the intensive decision to hold risky assets). Bank customers in West Germany hold significantly more total risky assets than their East German counterparts. Whenever East and West Germans hold risky internal assets at all, the amount of assets they hold is comparatively similar. However, given they hold risky external assets at all, the amount West Germans hold in risky external assets is much higher. Again Oaxaca-Blinder Decompositions indicate that only a small part of the observed differences between East and West German bank customers can be explained by differences in socio-demographic characteristics, income, liabilities and wealth (see the Oaxaca Decomposition reported in Table 12).

Third, we find differences between East and West Germans to be more pronounced among age groups which were old enough to have collected their own experiences with the former institutions. However, especially for the intensive dimension of (external) risky asset demand we observe strong differences between

Risky Assets

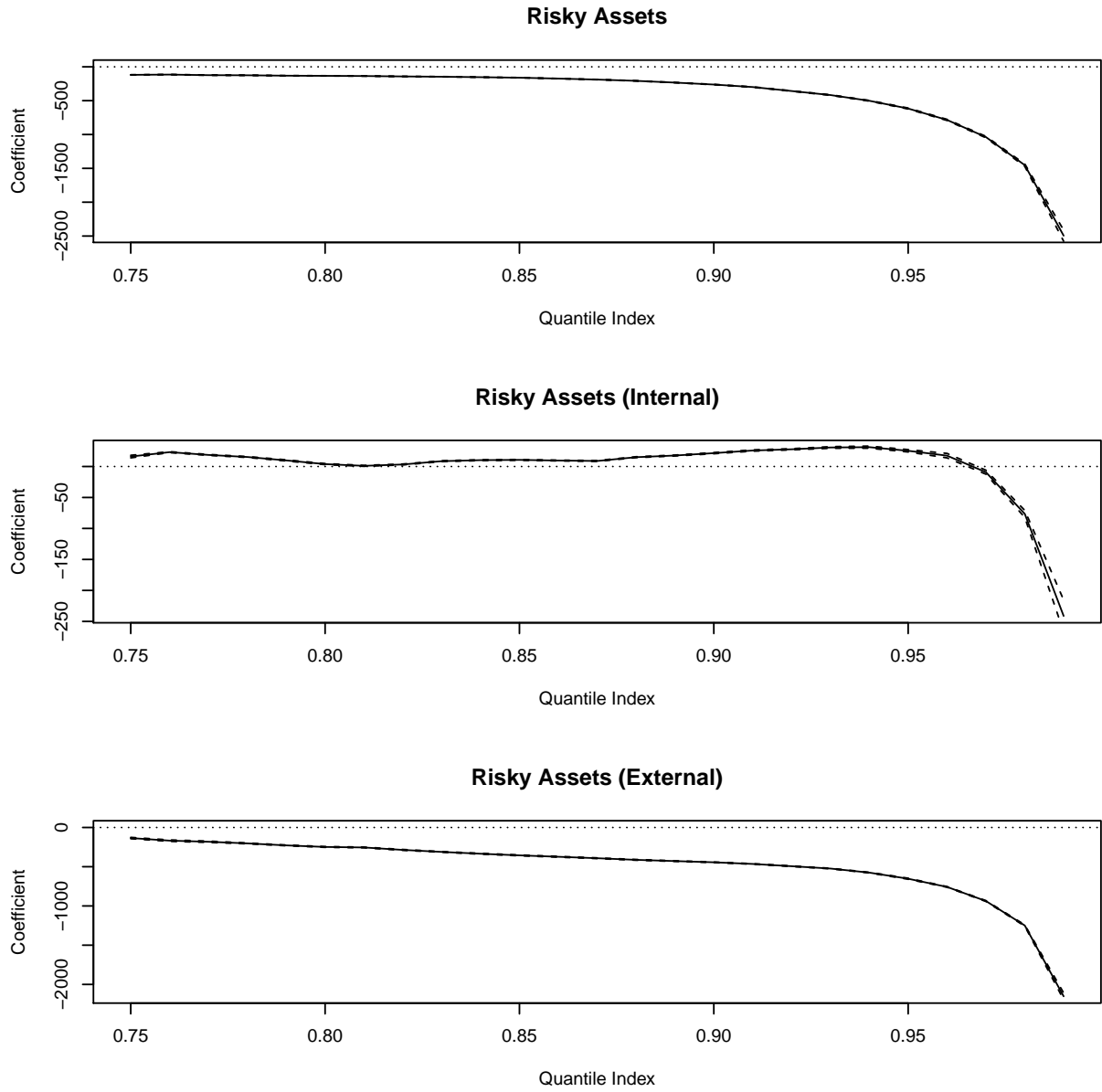**Risky Assets (Internal)**

Risky Assets (External)

Figure 5: Effect of East Dummy on Risky Asset Holdings with Age-East Interaction (Censored Quantile Regressions)

Table 11: Oaxaca Blinder Decomposition for Participation Decision in Risky Assets (Non-Linear, Yun (2005))

	Total risky assets $Risky$	Internal risky assets $Risky_{int}$	External risky assets $Risky_{ext}$
West	0.191***	0.114***	0.108***
	(0.004)	(0.007)	(0.011)
East	0.195***	0.144***	0.083***
	(0.008)	(0.009)	(0.008)
Difference	-0.005	-0.030***	0.025*
	(0.009)	(0.011)	(0.014)
Explained	-0.001	-0.005	0.009
	(0.006)	(0.007)	(0.009)
Unexplained	-0.003	-0.025***	0.016*
	(0.005)	(0.006)	(0.009)
N	1,774,475	1,774,475	1,774,475

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included.

Gross financial wealth (GFW) excludes the risky asset class

belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Oaxaca Blinder Decomposition for Risky Asset Holdings (Conditional OLS)

	Total risky assets $Risky$	Internal risky assets $Risky_{int}$	External risky assets $Risky_{ext}$
West	32,322.97***	11,865.97***	44,375.70***
	(1,691.41)	(1,583.28)	(1,845.74)
East	13,559.66***	9,873.34***	14,764.11***
	(610.35)	(488.48)	(533.88)
Difference	18,763.30***	1,992.63	29,611.58***
	(1,798.16)	(1,656.92)	(1,921.40)
Explained	2,083.29	-243.73	2,578.68**
	(1,424.37)	(929.79)	(1,194.47)
Unexplained	16,680.02***	2,236.36	27,032.91***
	(631.63)	(1,822.44)	(1,181.06)
N	344,855	244,242	156,761

Standard errors (clustered on the NUTS III level) in parentheses.

Full set of control variables included.

Gross financial wealth (GFW) excludes the risky asset class

belonging to the left hand variable.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

younger East and West Germans, which had little possibilities to collect experiences with the former formal institutions themselves. Thus, to some extent, informal institutions seem to be transmitted to younger generations.

We interpret our findings as an indication that the effects of informal institutions on portfolio behavior are quite persistent, as our study bases on data which was collected 16 years after German Reunification. Our results indicate that the effects of reforms of formal institutions on portfolio behavior are more persistent as the results presented in Osili and Paulson (2008) seem to imply. Different from Osili and Paulson's (2008) study of U.S. immigrants we study the portfolio behavior of individuals which experienced a strong institutional change within their country of origin. These individuals live among individuals which themselves are inexperienced with the new institutions. Thus, they primarily communicate with individuals having very similar experiences and also similar informal institutions. Moreover, their peer groups turn out to be very similar to themselves. It seems that these circumstances tend to delay the change in informal institutions, at least in as far as risky portfolio composition and the intensive decision to hold risky assets is concerned.

It is an intriguing question which are the driving forces behind our results. While we cannot provide direct empirical evidence on this issue in this paper, we at least can speculate about them against the background of our results and those reported in the related literature. In line with the results reported in Fuchs-Schündeln and Haliassos (2015) there is little reason to believe that the observed differences between East and West Germans are the result of differences in product familiarity. More likely, differences in the internal locus of control and self-reliability can account for the observed results. As Friehe et al. (2015) report, socialist education left their traces in East Germans' personalities. Especially, East Germans exhibit lower levels of internal locus of control than their West German counterparts. Thus, they in general believe less in the possibility to influence their own future. Similarly, Bauernschuster et al. (2012) find that East Germans show systematically lower levels of self-reliance than their East German counterparts, a fact which can explain why there is much less entrepreneurial activity in East Germany. Personalities evolve strongly in young age. Throughout that time the former German Democratic State influenced school education excessively (Fuchs-Schündeln and Masella, 2015). As a consequence, young adults left school as "products of the regime" (Fulbrook, 2005). Besides school education, parental education played an important role in the former German Democratic Republic. Parents taught their children how to come along with the existing political system, which involved to accept the social rules established by the state and to avoid causing any trouble (Friehe et al., 2015). Self-initiative is unlikely to evolve under such circumstances. Finally, the experiences the citizens of the German Democratic Republic made themselves within the former political system likely shaped their personalities. As Hillman (1994) argues, the experience of central planning is likely crowding out self-reliance. We suggest that as a consequence of these differences in personality, East Germans more often decide to buy mutual funds issued and managed by their savings bank rather than relying on their own expertise in buying stocks and derivatives. And it might also explain why East Germans invest much less wealth in risky external assets even when they in principle, decide to make use of this option. The fact that we still find systematic differences between East and West Germans in the younger age groups which themselves were neither exposed to socialist education nor collected their own experiences in the former political system are likely due to the still effective informal institutions. These institutions

might have been passed on to the younger generation via parental education but also through interaction with social networks in which the former informal institutions still prevail.

Our findings have important implications for financial development of countries reforming their formal and especially their economic institutions. While formal institutions can be changed quite quickly, our results indicate that informal institutions turn out to be highly persistent. The example of Germany is a fruitful lesson in this respect. When Germany was reunified in 1990, West Germany was among the financially and economically most well developed countries. Soon after German Reunification almost all formal institutions were transferred to East Germany. However, although East Germany thus faced a highly favorable starting position into the process of transformation, our results indicate that the informal institutions prevailing in East Germany still differ to a significant extent from those in West Germany sixteen years after reunification. Since the earlier presented empirical evidence indicates that informal institutions are passed along to later generations, we should expect these informal institutions to change only very slowly. Transformation (or more general reform) countries with less favorable starting positions and later starting points of their transformation processes will need long periods of time before the degree of stock market capitalization will reach similar levels as in traditional market economies.

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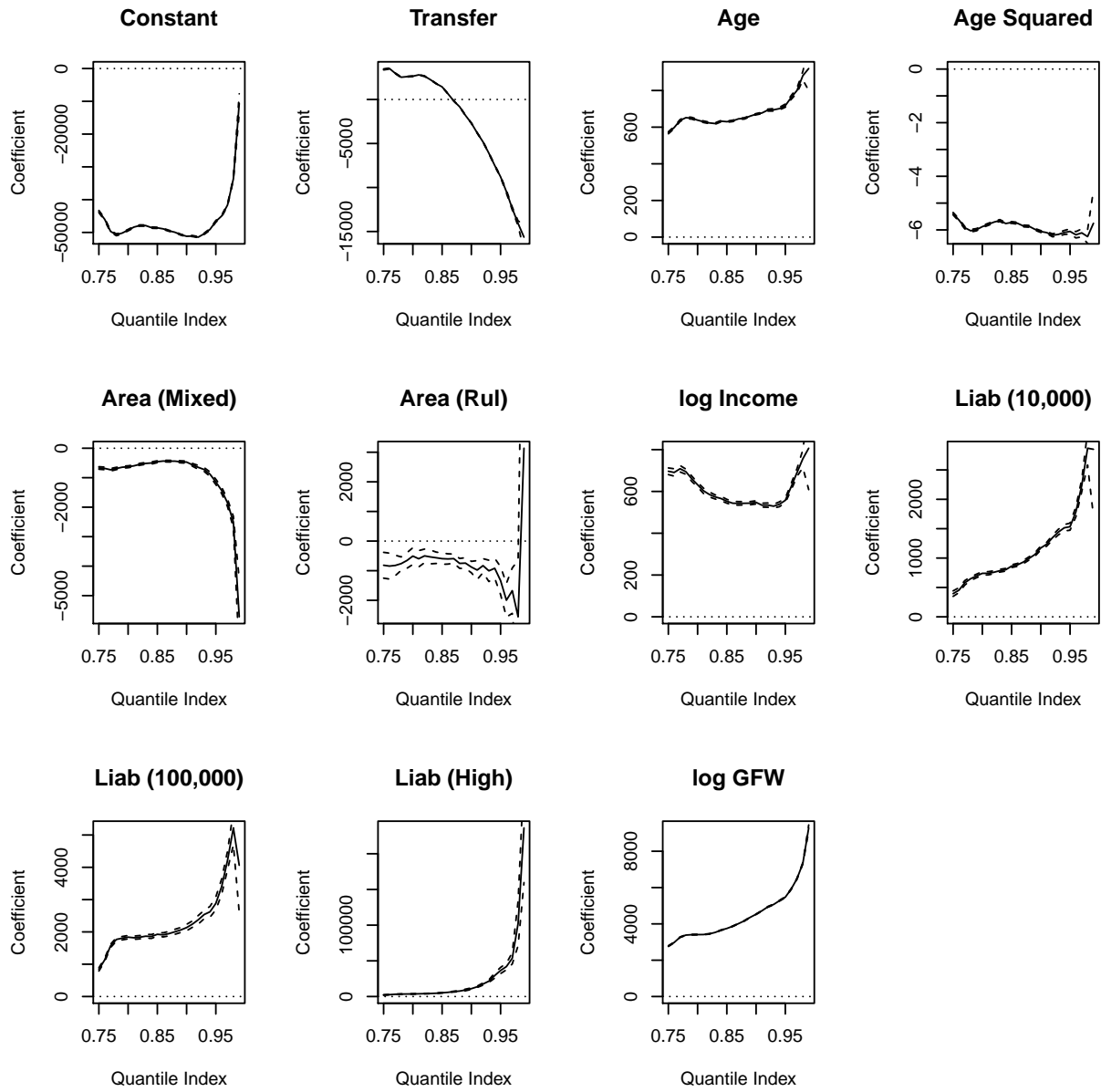
Figure A.1: Determinants of Total Risky Asset Holdings (Censored Quantile Regressions)
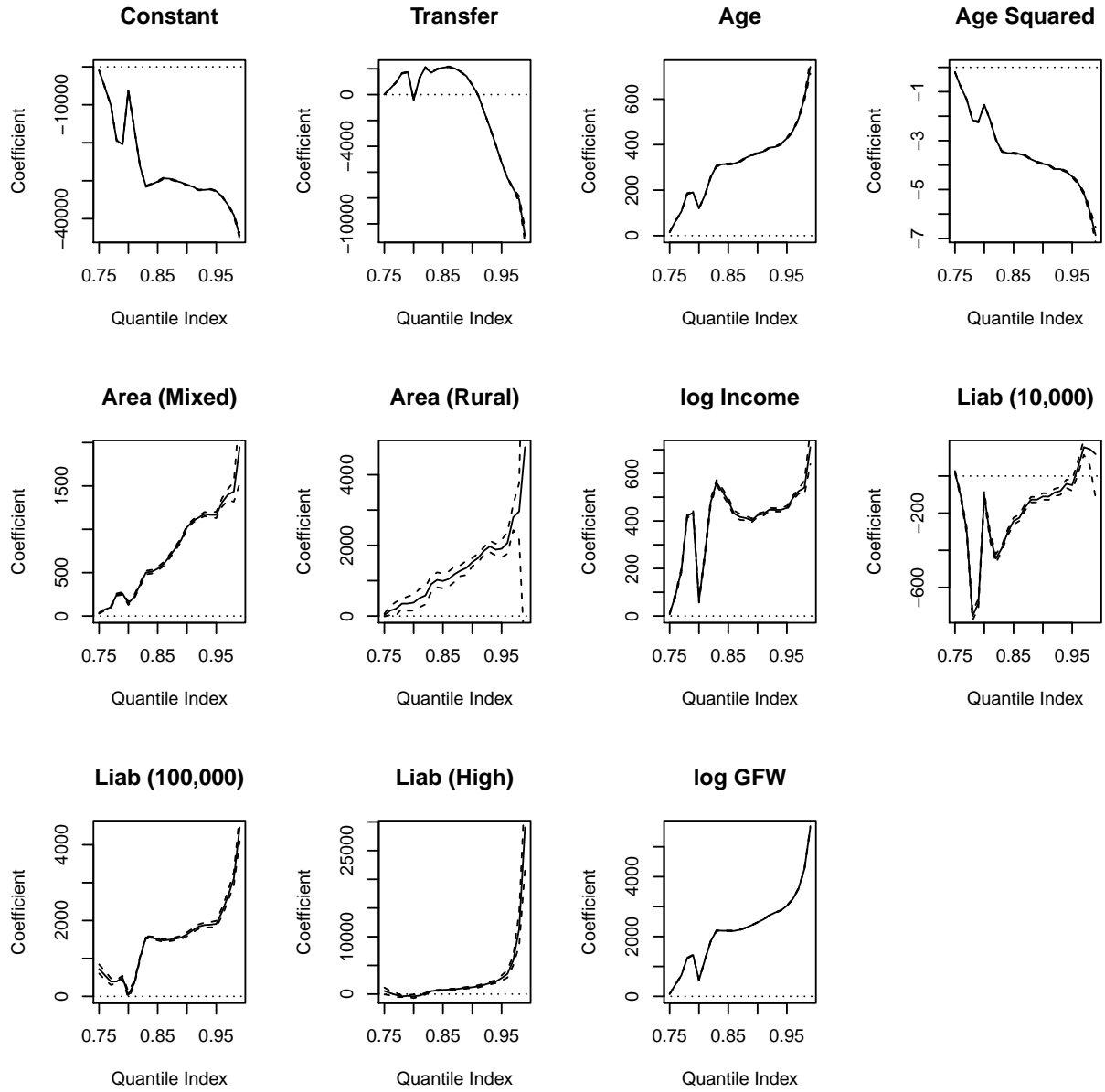
Figure A.2: Determinants of Internal Risky Asset Holdings (Censored Quantile Regressions)
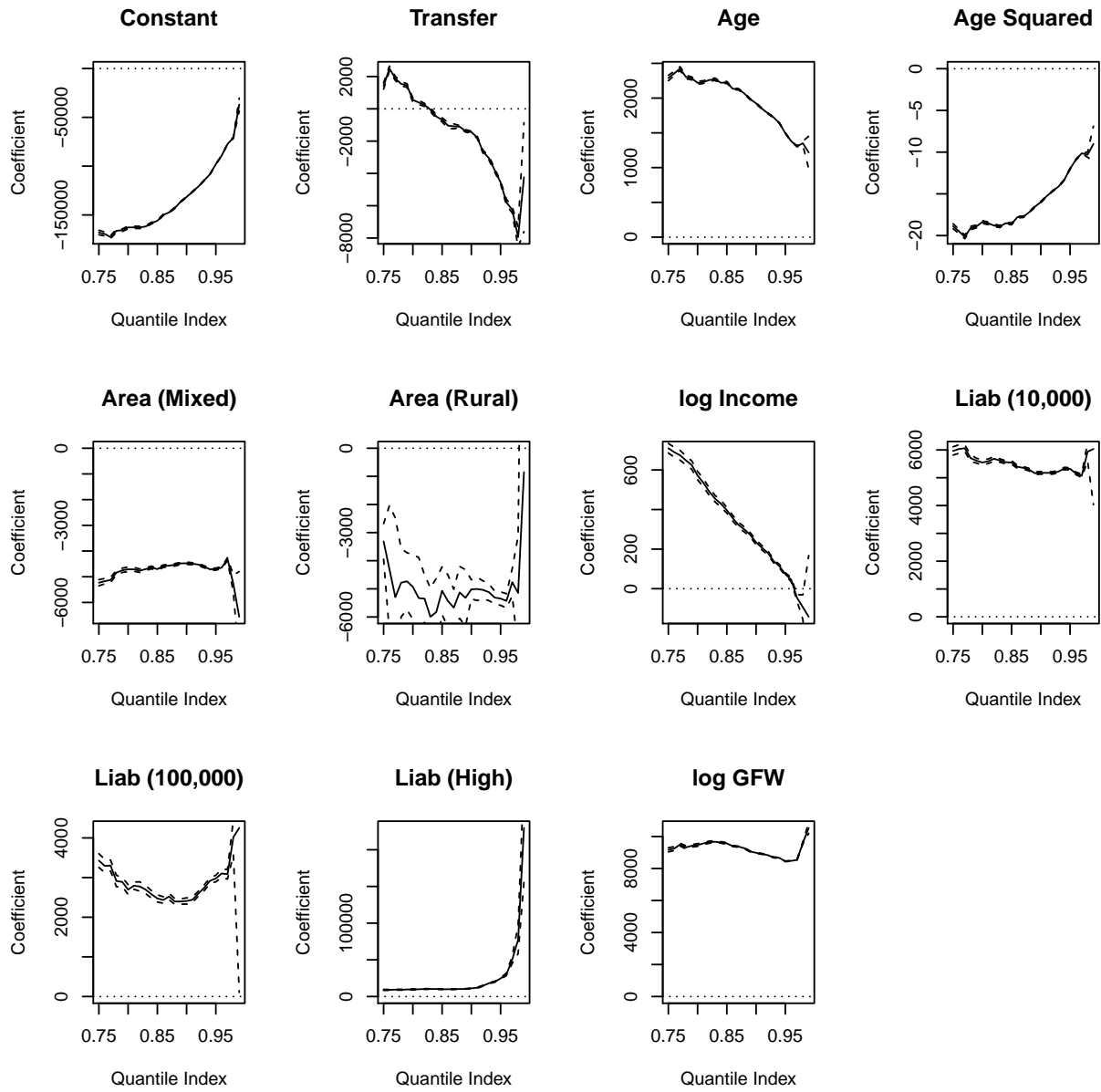
Figure A.3: Determinants of External Risky Asset Holdings (Censored Quantile Regressions)
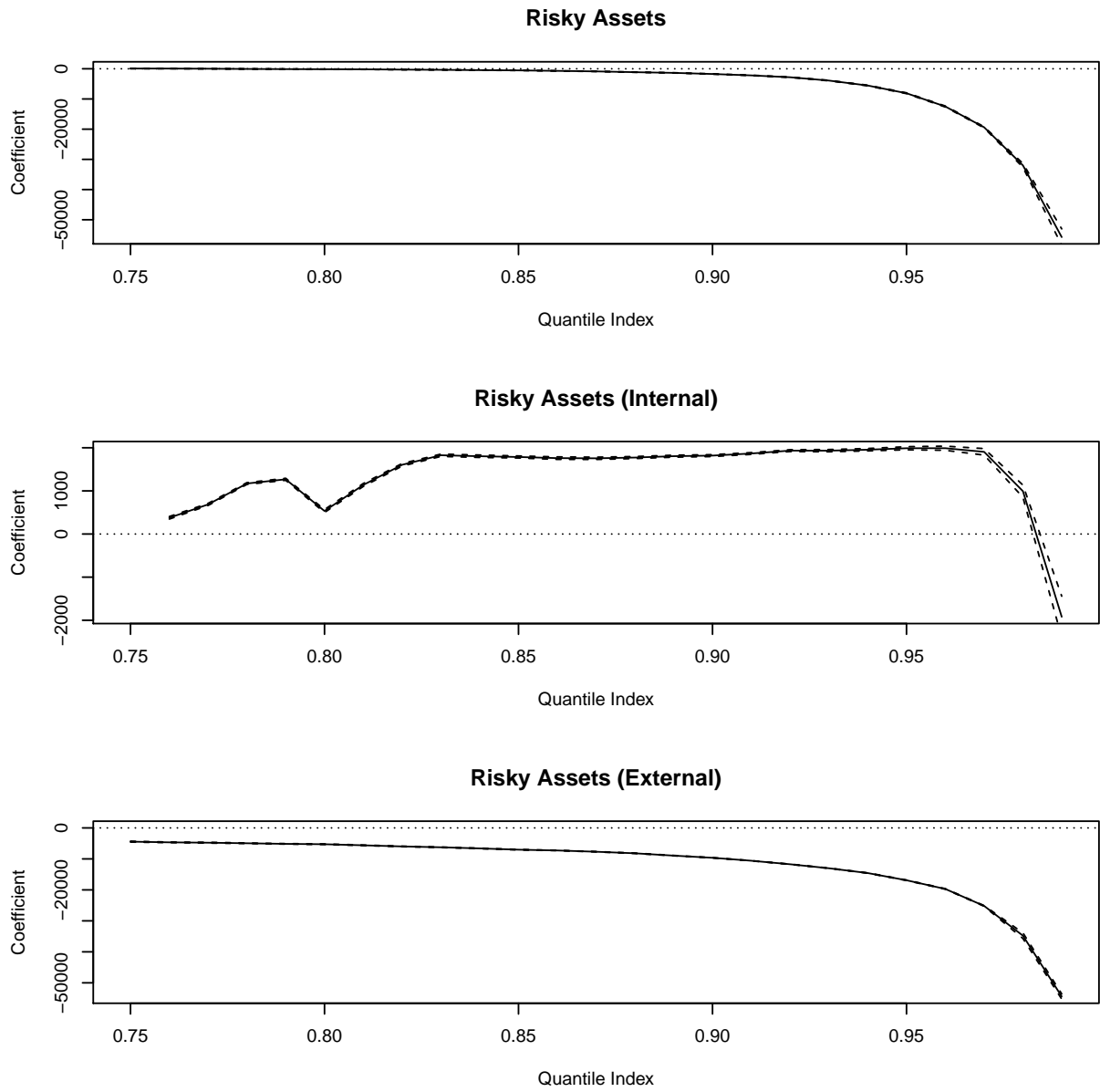
Risky Assets

Risky Assets (Internal)

Risky Assets (External)

Figure A.4: Effect of East Dummy on Risky Asset Holdings with Housing-Wealth Control (Censored Quantile Regressions)

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