

Participation Following Sudden Access[#]

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Abstract

This paper employs the German reunification “experiment” to study how sudden access to previously unavailable financial products, supported by knowledgeable practitioners, influences participation. Findings provide new perspectives on participation and inertia. Controlling for characteristics, East Germans experienced a jump in securities participation to a level comparable to West Germans’ participation immediately following reunification, and to an even higher level for consumer debt, while exhibiting inertia in previously accessible products. They showed no signs of subsequent retreat. Lower financial resources are the most important characteristic explaining lower East German participations in all asset classes, while expectations and peer effects are important drivers of the high East German debt participation. Average income among the new peers has had larger effects on East than on West German participation in both securities and consumer debt.

Keywords: Household finance, asset market access, stockholding, household debt, consumer credit, social interactions, counterfactual analysis, German reunification.

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1. Introduction

Financial innovation provides sudden access to products that were not available to households before, and a challenge to the financial sector to market and manage new products. Recent history contains numerous examples of positive and negative experiences with products that were new to both sides of the market. These include mutual funds, defined-contribution retirement accounts, home equity loans, and structured products,¹ which provided opportunities to consumers, but also gave rise to various “misselling” scandals.² The response to such experiences with new products has been broad-spectrum intervention in the market for new financial products, including product bans, controlled access based on previous user experience, and financial sector regulations intended to separate advice from sale of products (such as the “fee only” advice introduced in Germany in 2015). Studying a counterfactual, in which sudden access was provided by a knowledgeable and well-incentivized financial sector, can help disentangle the challenges posed by novelty on the two sides of the market, advance our understanding of inertia in portfolio adjustments, and provide input for a more focused future approach to regulation and dissemination of the benefits from financial innovation. German reunification is a useful “natural experiment” for studying such a counterfactual.³

¹ The merits of product sale bans are usually evaluated in the context of highly complex or rapidly evolving new products, such as structured products, that are unfamiliar even to the financial sector at large, and for which complexity is associated with larger hidden markups (see Celerier and Vallee, 2014).

² Mutual funds and defined-contribution pension accounts were major drivers for the spread of stockholding in the US, and Kenneth Arrow (1987) argued persuasively that increased access to stocks offering an equity premium can have important effects on reducing wealth inequality. Consumer credit through home-equity loans was advertised in the US in the 1990s, but the recent US financial crisis then led to sharp increases in bankruptcy rates of home owners. The risk of mis-selling to customers, the conflicts of interest confronting financial advisors, and shortcomings in financial advice have been the subject of a growing literature on financial advice and its effects on financial behavior of households with different observable characteristics. Early contributions to this work are Inderst and Ottaviani (2009), Hackethal et al (2012), Mullainathan et al (2012), and Bhattacharya et al (2013).

³ This large-scale natural experiment has been used to analyze other economic phenomena. Fuchs-Schündeln (2008) examines the effect of reunification on saving rates, while Fuchs-Schündeln and Schündeln (2005) use the ‘experiment’ to assess the importance of self-selection into occupations as a

Following German reunification in 1989, the subset of the German population living in East Germany was given sudden access to “capitalist” financial products (such as securities and consumer credit) long available in the West, by a financial sector well-informed about such products and well-incentivized not to take advantage of its new customers.⁴ The effect of sudden access on participation can be assessed comparing East to West German behavior, controlling for household characteristics. Interestingly, East Germans continued to have access to other products (such as savings accounts and life insurance), allowing one to compare their behavior across the two product types – newly available vs. well-established products - over time, in light of the literature that finds widespread inertia in the population with respect to participation status and to portfolio rebalancing.⁵

We are able to ask a number of questions. Is wider financial product access even relevant to people who previously lacked access? Do they take advantage of the new opportunities, or are they stuck in non-participation through the by now well-established portfolio inertia? Is their response to newly and to previously accessible

partial substitute for precautionary wealth holdings. Redding and Sturm (2008) and Burchardi and Hassan (2013) analyze the cost of remoteness and the economic impact of social ties, respectively, based on this experiment. Gebhardt (2013) uses this experiment to test the proposition that allocations of asset ownership that expose a party to ex-post expropriation reduce this party’s ex-ante relationship-specific investments. For an overview, see Fuchs-Schündeln and Hassan (2016).

⁴ The latter is implied by the long horizon of the new relationship and supported by statements of the German Central Bank over the years. See below for evidence on the actual behavior of the financial sector in the period under consideration.

⁵ Brunnermeier and Nagel (2008) find inertia with respect to adjusting portfolio shares using PSID data. Biliias, Georgarakos, Haliassos (2010) find considerable inertia in stockholding participation in the general population of US households through periods of stock market boom and bust, using PSID and Survey of Consumer Finances data. Calvet, Campbell, Sodini (2009) establish aggregate sluggishness despite considerable heterogeneity in active rebalancing behavior among different wealth and education groups. Abel, Eberly, and Panageas (2013) model portfolio inertia in the context of inattention induced by observation costs, extending to portfolio choice the concept of Reis (2006) and Sims (2003), and find that time-dependent rebalancing rules are optimal. Alvarez, Guiso, Lippi (2012) introduce physical adjustment costs for durable goods consumption in addition to financial asset observation costs and find that a combination of a time- and state-dependent rebalancing rule is optimal. Pagel (2018) builds a model with “news utility” in which inertia is induced by aversion to bad news, while Olafsson and Pagel (2018) find supportive empirical evidence from Iceland.

products consistent with our current understanding of portfolio inertia, does it refine or challenge this notion? Importantly, we answer these questions in the context of a knowledgeable and likely well-motivated financial sector, in which the products are new to the consumer side, but not to the supplier side. Our findings have implications for the literatures on asset and debt market participation, on portfolio inertia, and on regulation of product access and of financial sector incentives and practices.

We first document differences in participation patterns between East and West Germans following reunification, differentiating between products newly available to East Germans, namely securities and debt, and products previously available, namely saving accounts and life insurance. We then decompose these East-West differences into “covariate effects” and “coefficient effects”. Covariate effects capture differences in observable characteristics between East and West Germans: to what extent can the different behavior be simply explained by differences in characteristics? Coefficient effects, on the other hand, document differences in behavior controlling for characteristics: to what extent do households with the same characteristics behave differently, depending on whether they lived in East or West? We estimate both effects year-by-year, allowing for changes over time in household characteristics and in how these are linked to participation behavior (coefficients). We then probe further into each of the two effects. On covariate effects, we distinguish the roles of covariates related to household resources, demographics, and sentiment including peer comparisons. We also examine whether significant parts of our estimates of coefficient effects can be explained through additional data on characteristics that relate to sociability, trust, and risk preferences, but are available only for some survey waves.

Following reunification, East Germans exhibit higher participation in consumer debt and lower participation in securities than West Germans. For assets previously

accessible to East Germans, we find greater participation rates, both initially and for a number of years following reunification, but eventually they drop below participation rates of West Germans.

Decomposing average behavior in a covariate and a coefficient effect, we present a number of striking new findings. First, controlling for their characteristics, East Germans experienced a jump in securities participation immediately following reunification to a level comparable to that of West Germans. Thus, the lower stock and bond market participation of East Germans is entirely explained by their different characteristics, with their financial resources being the most important ones. This is all the more notable, given the fact that East Germans were subjected to years of propaganda against capitalist products.⁶ Second, they experienced either a jump or a dramatic increase in participation in previously inaccessible consumer debt, from zero to levels above those of West Germans, even controlling for differences in characteristics.⁷ Third, similarly, also controlling for characteristics they reduced their participation in previously available assets only gradually, even while rapidly embracing newly available instruments. Our results thus confirm substantial participation inertia in previously available financial products, which is consistent with existing literature on portfolio inertia and inattention, while pointing to jumps following sudden access provided by a knowledgeable and well-incentivized financial sector. Fourth, regardless of whether overall covariate effects are positive, as in the case of stock market participation, or are estimated as small or insignificant, as in the case of consumer debt, different aspects of household characteristics still play an interesting,

⁶ For example, stocks were equated to ‘weapons of capitalism’ by the regime of the German Democratic Republic (Laudenbach et al., 2018).

⁷ Since we observe consumer debt only from 1997 onwards, we cannot determine whether the participation in consumer debt increased continuously between 1990 and 1997 or jumped right at reunification.

albeit conflicting, role. Financial resources always point to lower participation of East Germans, while sentiment and demographics tend to point to rather higher participation. Overall, our econometric analyses confirm relationships of participation probabilities with household characteristics typically stressed in the existing participation literature. Fifth, average income among the newly established group of West and East German peers following reunification has had a larger effect on East German than on West German financial behavior. Sixth, occasionally available data on attitudes towards financial or general risk, trust, and sociability bear relationships to participation consistent with the existing literature, but they hardly reduce the estimated size of coefficient effects that we find.⁸

Section 2 describes the data and Section 3 the time-varying participation patterns of East and West Germans in securities and consumer debt after East Germans gained sudden access to these instruments. Section 4 decomposes these East-West differences in participation following sudden access into covariate and coefficient effects. Section 5 probes further into the results, through an analysis of the importance of different characteristics for participation differences, examination of the interplay between sudden access and portfolio inertia, as well as robustness to consideration of further household characteristics relating to trust, sociability, and risk preferences. Section 6 offers concluding remarks.

2. The Data

The German Socio-Economic Panel (GSOEP) is a longitudinal panel study of private households, established in West Germany in 1984 and carried out annually.⁹

⁸ On trust, see Guiso, Sapienza, and Zingales (2008) and on sociability see Hong, Kubik, and Stein (2004).

⁹ A detailed description of the survey can be found in Wagner et al. (2007).

The GSOEP consists of two questionnaires: one is at the household level, and the other one collects information on each member of the household. In the spring of 1990, a representative sample of East Germans was added to the survey. Additionally, new households from both East and West Germany were added in subsequent refreshment samples. We include all subsamples into our final sample with the exception of the high income subsample.¹⁰

The GSOEP includes a question on where individuals lived before the fall of the Berlin Wall in 1989. We identify individuals as East Germans if they indicate that they lived in East Germany (GDR), including East Berlin, before 1989. Similarly, we identify individuals as West Germans if they indicate West Germany (FRG) including West Berlin as their residence before 1989. Thus, “East” and “West” consistently refer to residence before reunification in our analysis, independent of the current residence. All other observations are dropped; in particular, all households whose household head was born after 1989 or lived in another country before 1989 are not part of the final sample.

The asset participation data in the survey are recorded at the level of the household. The questionnaire asks which assets the respondent or any other person in the household possessed last year. The list of possible answers includes: savings account (*Sparbuch/Spargirokonto*), building-savings contract (*Bausparvertrag*), life insurance (*Lebensversicherung*), bonds (*Festverzinsliche Wertpapiere*), stocks (*andere Wertpapiere*), company assets (*Betriebsvermögen*), and none of the listed.¹¹ However,

¹⁰ The high income sample (Sample G of the GSOEP) is unique in that it does not have an analogous benchmark in any other major German survey, be it panel or cross-section. This is why this sample is not included in the overall standard weighting scheme of GSOEP (for further details see <http://www.diw.de/documents/dokumentenarchiv/17/38951/dtc.354256.pdf>).

¹¹ We do not investigate building-savings contracts, which are fairly unique German products, and company assets, which are closely linked to self-employment.

it is only since 2000 that stocks and bonds are separately listed.¹² Before that year, both asset types were included under the common header securities (*Wertpapiere*). Note that this change in the question coincides with a jump in the participation rate for securities, i.e. stocks and bonds, from 31 (23) percent in 1999 to 39 (31) percent in 2000 for West Germans (East Germans). This might well be due to the more detailed design of the question. The consumer debt data are recorded at the household level as well, starting only in 1997. The question reads (with slight changes over time): “Do you have to use a certain amount of your income for paying back loans that you took out for major purchases or other expenses?”¹³

We carry out our analysis at the household level including individual characteristics, e.g. gender, from the household head’s individual questionnaire. The head of the household is defined as the person who knows best about the general conditions under which the household acts, and is supposed to answer the household questionnaire in each given year.

2.1. Data transformations

Most questions refer to the situation in the respective survey year; however, some questions refer to the previous year, in particular the asset participation question. Therefore, we require households to participate in the survey for two consecutive years, in order to have a complete picture of the situation in a given year. All statistics use weights, provided by GSOEP, to account for panel attrition and the sampling scheme. All nominal variables are in € and are adjusted to represent purchasing power in 2000. In accordance with the residence in the observation year, inflation rates are taken from

¹² The change occurs in the questionnaire 2001, i.e. refers to participation in the year 2000.

¹³ Mortgage payments are explicitly excluded in this question.

the CPI in East or West Germany until the year 1999, and from a common CPI from 2000 on.

Peer income is constructed in the following way: All household heads (both East and West Germans) are grouped in four age groups (25-35, 36-45, 46-65, and above 65) and three educational groups. We construct the educational groups according to the International Standard classification of Education (ISCED-1997).¹⁴ All individuals in the first group have completed general elementary schooling (*Haupt-/Realschulabschluss*) at most. Individuals in the second group have higher educational attainment in the form of a high school diploma (*Abitur /Fachhochschulreife*), vocational training, or kindred. The third group represents individuals with a tertiary education degree, i.e. completed college education (*Fachhochschule, Universität, Promotion*). Average income is computed for each possible combination of age and education groups. Finally, an individual's "peer income" is then set to the average income of the respective age and education group (excluding the individual's own income).

2.2. Sample size

We use 1991, the first full year after reunification, as our starting date.¹⁵ The final sample consists of 158,000 observations for the years 1991 to 2009, namely 112,000 observations for West Germans and 46,000 observations for East Germans. Yearly observations vary between 6,000 and 7,000 in the 1990s, and amount to around 10,000 in the 2000s. East Germans represent around 2,000 of those yearly observations in the 1990s and around 3,000 in the 2000s. When we include income growth

¹⁴ A detailed description can be found in the GSOEP documentation: http://www.diw.de/en/diw_02.c.238110.en/generated_variables.html

¹⁵ German reunification happened on October 3, 1990. Also, for the years 1990 and 1989 we do not have information on asset income, which we use as a proxy for wealth in a robustness check.

expectations, the sample size is further restricted, since we need at least three consecutive observations to observe the full set of covariates.

3. Observed participation following sudden access

In this section, we document the evolution of participation in two financial instruments, securities and consumer debt, for two groups of households, based on whether the head of household reports having lived in East or in West Germany prior to 1989. East Germans were provided with access to securities and consumer debt right after reunification, but neither asset class was available to them prior to reunification. Participation rates are computed using survey weights and are reported for all periods in our sample for which they are available.¹⁶

The upper two panels of Figure 1 plot participation rates, separately among West German and East German households, in each of the two product classes between 1991 and 2009 (starting in 1997 for consumer credit). Sudden access of East Germans to securities led to a jump in participation in these products from zero prior to reunification to 12.5% in 1991, which was about half the participation rate of West Germans. Observed participation grew over time, reaching 23% by 1999, and decreased somewhat after the burst of the internet bubble in 2001.¹⁷ The upward and downward trends of observed participation rates in securities by East Germans largely match the trends in participation among West Germans, with somewhat faster growth at the start, and faster decline towards the end of the period (after 2005). Thus, East German

¹⁶ We can observe participation in the two types of securities, bonds and stocks, separately after year 2000.

¹⁷ As described in the data section, the sharp increase between 1999 and 2000 might be at least partly due to the change in the question asked and should thus be interpreted carefully (we indicate this change in the question with a vertical line in the figure).

participation in securities market lags behind the West German one over the entire sample period, with the difference first decreasing and then increasing again.¹⁸

The common upward trend in securities market participation in the first period matches the international experience of increases in financial risk taking and especially in stock market participation of households during the 1990s (see Guiso et al, 2001). Existing literature attributes this increase in financial risk taking that took place in both Europe and the US in the 1990s to a combination of good stock market performance, dropping transactions costs, and spread of equity culture resulting from growing realization that social security systems will be unable to provide pension benefits at previous levels as a result of the demographic transition. A German peculiarity in this time period was the initial public offering of Deutsche Telekom, the formerly public German telecommunication company, in late 1996, and additional equity issuance until 2000. Both were accompanied by mass advertisement and induced many Germans to invest in stocks for the first time in their life.

When we look at observed participation rates in bonds and stocks separately (available from 2000 onwards and not reported here), we find that participation rates were higher in stocks than in bonds for both groups. West Germans had higher participation than East Germans throughout, but East Germans exhibited a somewhat larger decline in stock market participation following 2006 than did West Germans.

Apart from securities markets, East Germans also experienced sudden access to consumer credit. We can report participation rates for consumer debt for the period 1997 to 2009 (upper right panel in Figure 1). Although we cannot observe if sudden access gave rise to a participation jump in consumer credit at reunification, it is quite instructive to note that, by 1997, the East German participation rate exceeded that of

¹⁸ In unreported analysis, we find that participation rates in stocks and in bonds are higher for West than for East Germans, regardless of the education group being examined.

West Germans by more than 9 percentage points; and that the sign of the gap remained the same throughout the period of observation. If sudden access to consumer debt did not produce a participation jump in the East, it must have produced a fast pace of growth in participation in the period for which data are not available.¹⁹ The participation gap narrowed somewhat from 2006 onwards, suggesting that in that period East Germans were cutting down on their participation both in securities and in consumer debt more than West Germans.²⁰

Greater tendency to participate in consumer debt should not be identified with greater financial fragility, at least as measured by debt service relative to income. Table 1 shows mean and median ratios of monthly payments on consumer debt relative to household income (a measure of the debt service to income ratio) for individuals with positive consumer debt. Regardless of whether the average or the median is used, West German ratios were higher than East German ones until 2004. The ranking gets reversed from 2005 on, but differences remain small.²¹

Summarizing, we find a jump in participation under sudden access to securities, and a massive participation increase (possibly involving a jump) under sudden access to consumer credit.²² However, the two cases exhibit a difference when comparing to participation of West Germans, who had continuous access to both product classes:

¹⁹ Lower stocks of consumer durables in the East than in the West at reunification could have led to a higher demand for consumer durables in the East in the first years after reunification. What is interesting for our analysis is that East Germans made use of consumer debt to satisfy this potentially higher demand. See also footnote 25.

²⁰ For both East and West Germans, participation rates in consumer debt exhibit a stark rise between 1998 and 1999, and a remarkable fall between 2003 and 2004. The only noticeable difference in the wording of the question between these years is that in 2005 (i.e. relating to participation in 2004), the exclusion of mortgage payments from the question is explicitly stated not only at the end, but additionally at the beginning of the question.

²¹ We also run a regression on the joint East and West samples with the debt-to-income ratio on the left hand side, and the explanatory variables used in Tables 2 to 5 on the right hand side, plus year fixed effects and an East dummy. The East dummy coefficient is negative and significant, indicating that East German debt-to-income ratios are lower also after controlling for observable characteristics.

²² Note that, in both cases of continuous and of sudden access, the (West German) financial sector is highly knowledgeable and experienced in all four product classes examined.

East German participation in securities following sudden access jumps to a lower level than that of West Germans; while East German participation in consumer credit rises (possibly involving a jump in the unobserved period) to a higher level than that of West Germans. The first might indicate some inertia, while the second points against it. Yet, the question remains whether the observed patterns really reflect different behavior, and thus inertia, or are driven by different characteristics of East and West Germans. Decomposing East-West differences in participation following sudden access can shed further light on this, and it is to such decompositions that we now turn.

4. A decomposition of participation differences following sudden access

In this section, we decompose the observed differences in participation rates into differences in household characteristics relevant for participation, as opposed to differences in behavior of households with otherwise similar characteristics that happened to have lived in East or West Germany before reunification. The former, arising from differences in participation-relevant characteristics, is attributed to what are known in the literature as “covariate effects”; the latter, arising from different behavior of East and West households with similar characteristics, is attributed to “coefficient effects”. Both terms refer to a participation regression (in our case, a probit model) for the base group (here West Germans) that makes the latent variable (utility differential between participation and non-participation) a function of observable characteristics (“covariates”), denoted by X_{it} , and of the sign and magnitude of coefficients, b_t . The decomposition is based on year-by-year regressions and allows for time variation in coefficients.

4.1. Lessons from the underlying participation regressions

We first present estimates of marginal effects that provide an overall picture of the relationship between characteristics and participation in the West and East subsamples. Tables 2 and 3 report participation regressions of West and of East Germans in securities, and Tables 4 and 5 in consumer debt, pooling all available survey years and allowing for year and state fixed effects.

Specifically, we include as regressors a gender dummy, four age categories (20-34, 35-49, 50-65, and above 65), and marital status (single, married, and divorced). Furthermore, we control for household composition by including categorical variables for the number of adults (1, 2, and 3 and above) and children (0, 1-2, and 3 and above). The three categories "at most general schooling", "completed high school", and "completed college" describe the household head's educational attainment. We capture the labor force status and occupation of the household head, distinguishing between retired, unemployed, not in the labor force, apprentice, self-employed, blue collar, white collar in financial sector, white collar in non-financial sector, and civil servant. We also control for (the logarithm of) household monthly net income. We proxy for wealth through a dummy variable that indicates homeownership. Asset amounts (and, as a result, household wealth) are not regularly reported in GSOEP.²³ We have also run specifications that control for asset income, either in levels or in categorical form. Since results using this proxy for wealth (available on request) were not materially different from those that did not include the proxy, and since asset income is endogenous to the participation decision, we report results from specifications that do not include a financial wealth proxy. Finally, we add three proxies for consumer sentiment, namely whether the household head reports being concerned about the general economic

²³ They are only reported in 2002 and 2007.

development, and about the household's own economic situation,²⁴ plus our constructed measure of the level of average peer income. Reunification significantly changed the peer groups for both East and West Germans. As explained in Section 2.1, we focus on changes in the broader circle of peers following reunification, namely both East and West Germans of comparable age and education to the respondent. The idea behind including the average peer income as a control is that relative income ("external habits" or "exogenous effects" in the recent peer effects literature) induce households to adjust their consumption, saving or borrowing, in order to keep up with their peers financially.²⁵

For both West and East Germans, the estimated signs and statistical significance of marginal effects are consistent with the existing participation literature. Moreover, qualitatively the associations between household characteristics and participation are for the most part similar in both East and West, indicated by the same sign of the coefficients in East and West samples, but there are differences in estimates, and occasionally in sign and significance.²⁶

Specifically, in both samples, variables indicating resources (labor income and the homeownership proxy for household wealth) are positively related with the probability

²⁴ The relevant question is: "What is your attitude towards the following areas – are you concerned about them? General economic development / Your own economic situation." There are three answer categories, namely "very concerned", "somewhat concerned", "not concerned at all". We transform these into a dummy variable that is equal to 1 if the respondent chooses "very concerned", and 0 otherwise.

²⁵ Most existing theoretical models, which are based on an infinite-horizon representative agent, imply greater consumption, less leisure, and greater accumulation of assets to keep up with the Joneses, both now and in the future (Liu and Turnovsky, 2005). Among recent empirical papers, Kuhn et al. (2011) find that winning a Dutch postal lottery tends to influence the probability that neighbors of the winner will buy a new car. Georgarakos et al. (2014) find that those who perceive themselves as earning less than the average of their peers are more likely to borrow and to borrow larger amounts. Bertrand and Morse (2016) show that non-rich households consume a larger share of their current income when exposed to higher income at the top of the local income distribution and provide evidence that the non-rich may have relied on easier credit to finance this consumption increase. Agarwal, Mikhed, and Scholnick (2019) find that the size of a lottery win by one neighbor increases subsequent borrowing and bankruptcies among other neighbors. The neighbors become more likely to engage in visible consumption and in greater exposure to risky financial assets.

²⁶ Our method for estimating and assessing significance of the effects of coefficient differences, described in section 4.2, takes account of the uncertainty surrounding coefficient estimates.

of securities ownership. Households headed by men are more likely to own securities. We capture a lower probability of securities ownership at older age with a flat or somewhat diminishing age profile. Those separated or divorced exhibit a lower tendency to hold securities, consistent with the heavy financial consequences of such life events. Additional household members, whether adults or children, are associated with lower tendency to hold securities, as less of the given resources is available for securities holding. Being more educated, white collar, and working in the financial sector are all positively associated with holding securities, consistent with their being knowledge-intensive assets. Reporting that one is very concerned about one's own economic development is plausibly associated with a lower probability of holding securities, consistent with a precautionary ("temperance") motive. Unlike for West Germans, being a retired or self-employed East German is not found to contribute significantly to participation in securities, while being a civil servant is associated with a lower participation probability. For West Germans, retiree and self-employment status may be acting partly as proxies for wealth, while civil servant status points to a lower background income risk, but such effects may be weaker in the East German sample.

Coefficient estimates in consumer debt regressions are quite intuitive. For West Germans, income is positively associated with the probability that the household has consumer debt, consistent with its greater ability to service it, while homeownership is negatively associated, consistent with the presence of committed related expenditures. There is a negative education gradient, both in terms of educational attainment and in terms of being white collar and working in the financial sector. Concerns about the own or the overall economic situation are associated with greater probability that the household is indebted. We estimate a diminishing age profile, and a greater tendency

to have consumer debt with greater household size and associated consumption needs for given resources. The positive association with separated or divorced status is consistent with the interpretation of this variable as capturing aspects of adverse financial consequences. In the East German sample, we observe qualitatively similar relationships, with some exceptions. Being married is strongly associated with greater tendency to have consumer debt, and being self-employed with smaller such tendency. There is a weaker education and financial education gradient than among West Germans, with white-collar financial sector status not being linked to participation in consumer debt. There is also no correlation with being very concerned about the general economic development.

One characteristic that shows particularly interesting differences in its association with participation between East and West is peer income. For both East and West Germans, the peer group changed significantly through reunification, which makes this an interesting episode to analyze peer effects. Specifically, we find that there is a positive marginal effect of peer income on consumer debt participation, both for respondents who were living in the East and in the West prior to reunification, with the point estimate being considerably larger for East Germans.²⁷ In view of recent peer effects literature (see footnote 25), this finding is consistent with a greater share of East Germans receiving lower incomes than the average of their peers. An analogous exercise for securities finds operative comparison effects only for East Germans and not for West Germans. Thus, it seems that East Germans are more influenced by peer income than their Western counterparts. Moreover, the result that people who perceive themselves as being poorer than their peers are more likely to participate in the stock

²⁷ As separate regressions are run, this allows for different coefficients on all controls in the East and in the West sample, as well as for differences in the configuration of characteristics. Notice also that, in order to avoid the reflection problem, we remove the respondent's income when computing average incomes in the peer group.

market, as we find it for the sudden immersion of East Germans in a pool of higher-income peers, is novel in the stock market participation literature.

The higher income of the West German peers may also have raised income expectations of East Germans (the “tunnel effect”). To control explicitly for this income expectation effect and to examine robustness of our findings, we also report in Tables 2-3 and 4-5 an additional column with regression estimates when including a “perfect foresight” measure of income expectations, namely the ex-post realized income growth over the next two years. Comparing columns (i) and (ii) of each of these tables, we see that the estimated marginal effects of peer income, net of macro effects, are largely unaffected by controlling for expected (perfect foresight) income growth. Perfect foresight income growth is strongly linked to securities participation for both groups, but weakly or insignificantly linked to consumer debt participation.

4.2. Covariate versus coefficient effects: Description of the method

We now derive decompositions into a coefficient and a covariate effect, estimated year by year for each financial instrument, so as to allow for time-varying coefficient differences across the two subsamples. The decomposition of the West-East difference in observed participation rates into the “coefficient” and the “covariate” effect in a particular year is represented by the following equation, where we suppress the time subscript:

$$pr^{West} - pr^{East} = \left\{ pr^{West} - \hat{p}^{Westb,EastX} \right\} + \left\{ \hat{p}^{Westb,EastX} - pr^{East} \right\}, \quad (1)$$

where pr^{West} stands for the participation probability in the West, and pr^{East} in the East.

The key here is the computation of the counterfactual participation rate, $\hat{p}^{Westb,EastX}$.

This is the (cross-sectional) average participation rate that West Germans would exhibit if they related their participation decisions not to their own characteristics but to those

of the East German pool (i.e. the coefficients b_t are taken from a participation regression run on the West German sample, year by year, but are applied to characteristics X_{it} of the East German sample). The first difference term on the right-hand side arises from using East rather than West German characteristics, so it represents the “covariate effect”. Both items in the second bracket refer to East German characteristics, but the counterfactual probability term uses West German coefficients. Since the difference is due to using different sets of coefficients, this second bracket represents the “coefficient effect”.

From an economic point of view, the first bracket shows the part of the participation difference that is due to a different configuration of characteristics in the East versus the West population. For example, part of the explanation for lower stockholding rates among East rather than among West Germans arises from lower incomes in the East, and this is attributed to covariate effects. On the other hand, there are differences in participation behavior between West and East Germans of the same observable characteristics, i.e. in the way that West and East Germans link their characteristics to their participation decision. Since the link is made through the coefficients on characteristics, it is referred to as the “coefficient effect”. We interpret such coefficient effects as mainly reflecting differences in household behavior, rather than differential treatment of East and West Germans by the financial sector. If consistent discrimination against East Germans by the financial sector, or more generally taking advantage of the newcomers from the East, could be substantiated despite the fact that it was illegal, this would run against our interpretation. We have undertaken extensive search into various public and private sector publications of the time in order to find references to instances of discrimination or banking fraud targeted

at East Germans. This search delivered no such evidence but pointed instead to a number of success stories on the supply side.²⁸

To construct the counterfactual participation probability and derive the decomposition for any given observation year, we first run a participation probit regression for the relevant financial instrument in the West German sample in that year and obtain the coefficients for the West. We are able to control for a range of household characteristics, as described above. Once the probit coefficient estimates for a particular year are obtained, we draw (randomly and with replacement) vectors of household characteristics in that year from the East German sample, thereby respecting any tendency of them to co-vary.²⁹ For each East German household drawn, we use the West German coefficient estimates of that year to compute the probability of participation that this East German household would exhibit in that year if it behaved like a household from the West. Once we compute these counterfactual probabilities for all East German households drawn, we average them to compute the counterfactual probability of participation in that year, $\hat{p}^{West | b, East, X}$.

We also compute 95% confidence intervals by bootstrapping both the sample of West Germans with replacement and running the corresponding probits; and the sample of East Germans, both for each year. This double bootstrap captures uncertainty in probit coefficient estimates, as well as randomness of the East German households

²⁸ Specifically, the publications we have reviewed include: Bundesbank speeches, Bundesbank Monthly Reports (Monatsberichte), corporate publications from banks active during that time, news reports, and publications of banking sector associations and consumer protection associations. The Bundesbank notes positive contributions of West German banks quickly moving into East Germany in the context of the introduction of the D-Mark and of offering East German customers a wide range of previously unavailable products. Some corporate publications also mention success stories from the introduction of the new currency. We only found references to one banking scandal: Bankgesellschaft Berlin leveraged public equity to undertake high risk loan and mortgage operations, while offering unrealistic return promises. It failed due to falling prices of investment holdings and fraudulent refinancing practices. The negative effects, however, fell largely on the finances of the city of Berlin, which was the ultimate guarantor.

²⁹ The number of draws corresponds exactly to the sample size.

drawn. Specifically, we draw with replacement 100 West and East samples from the respective original West and East sample of each year. We estimate one probit for *each* West sample, and we use the 100 sets of estimated coefficients together with the corresponding 100 draws from the East to obtain 100 realizations of the covariate and the coefficient effects in that year.³⁰ Finally, we examine whether zero lies in the 95% confidence interval of these estimated coefficient and covariate effects, in which case they are not statistically significant at the 5% level in that year.

4.3. Estimates of coefficient and covariate effects

Figure 2 shows, in its four panels, the West-East participation differences in the four financial instruments shown in Figure 1 (dark lines), but also how these observed differences are decomposed into those that arise from differences in a variety of household characteristics taken as a whole (blue lines labeled “covariate effect”), and from differences in the relationship of participation to these characteristics (red lines labeled “coefficient effect”), as explained above.³¹ The light dotted curves indicate 95% confidence intervals around the estimated effects.

The top panel uncovers a striking difference between the decomposition of participation in securities and consumer debt to which East Germans gained sudden access. In the case of securities, the observed East German jump to a lower participation rate than that of West Germans reflects entirely a difference in their underlying characteristics: coefficient effects are statistically insignificant, both initially and for

³⁰ Thus, to each bootstrapped West sample, we assign one bootstrapped East sample.

³¹ When we run the decomposition analysis, we can only include observations for which we have all the relevant control variables used in the participation regressions. By contrast, in the descriptive statistics, we use all observations. Therefore, the total East-West difference in participation can slightly differ in the descriptive statistics and in the decomposition analysis.

most part of the observation period, becoming significant only after 2005.³² Thus, while the observed participation rate in securities market of East Germans is lower than the one of West Germans, this can entirely be explained by their different characteristics. Controlling for these, the behavior of East Germans mimicked the one of West Germans already in the first year after reunification.³³

Interestingly, coefficient effects turn significant in favor of West German participation in securities around the time leading up to the recent financial crisis: for given characteristics, East Germans became progressively less likely than West Germans to be holding securities. Recent work by Laudenbach, Malmendier, and Niessen-Ruenzi (2018) has stressed the presence of propaganda against stocks in the East based on them being “weapons of capitalism”. Our findings suggest that this propaganda did not prove capable of discouraging entry of East Germans into the securities market following reunification, but they do not rule out that identification of stocks with capitalism may have contributed to the quicker dismissal of stocks by East Germans in this later period.

The other case of sudden access, namely consumer debt, involves an even bigger adjustment in participation than securities. We saw that East Germans became persistently more likely to participate in consumer debt markets than West Germans following sudden access, but Figure 2 indicates that this is not at all attributable to East German characteristics. One might conjecture that this behavior is due to poorer economic conditions of East Germans, but our decomposition analysis finds exactly the

³² In unreported breakdowns by cohort, we find this pattern for each cohort, except for the oldest one, born before 1930, where the difference is split between coefficient and covariate effects. In splits by educational attainment, we find coefficient effects to be largely insignificant regardless of educational attainment. This is more consistently so for stocks in particular (for the period in which we can observe them).

³³ Decomposition between the two types of securities, stocks and bonds, is possible from 2000 on. This confirms that the persistent shift in the relative tendency to participate in securities noted here reflects behavior towards stocks rather than bonds, where the pattern is erratic.

opposite: covariate effects are statistically insignificant throughout the period, and practically the entire observed difference in participation probabilities can be attributed to coefficient effects, i.e., a greater tendency of East Germans to have consumer debt outstanding compared to their West German counterparts of similar observed characteristics.³⁴

This first set of decompositions suggests that sudden access is followed by a jump (or a rapid substantial increase) in participation, at least to a level consistent with East German household characteristics, in the case of debt even to a higher level. This is quite striking, given the lack of access opportunities for East German households prior to reunification, as well as the lack of interaction with neighbors holding, or financial sector representatives marketing these instruments. This new finding, that sudden access to financial instruments can lead to participation jumps even beyond levels consistent with the relative characteristics of newcomers (as in the case of consumer debt), will be contrasted next to the significant inertia found in existing literature on household portfolio adjustments.

4.4. The interplay of access and portfolio inertia

Our findings on the quick rise in participation following sudden access to financial instruments in the presence of a knowledgeable financial sector are at first hard to reconcile with existing literature on portfolio inertia.³⁵ This literature has documented a widespread tendency to maintain the same participation status vis a vis a particular asset (or debt), but it has focused on standard cases, in which households

³⁴ In unreported separate analysis of groups with different levels of educational attainment, we find exactly the same patterns even for the highest levels of such attainment. This suggests that the drivers of these East-West differences do not diminish with literacy and information collection and processing ability, which are typically associated with higher educational attainment.

³⁵ For papers in this literature, see footnote 5.

had continuous access to the financial instrument examined. Is the quick participation in securities and consumer debt by East Germans due to some generic peculiarity in East German behavior or can it plausibly be attributed to sudden, rather than continuous, access?

Our approach to answering this question is to study East German behavior in two financial instruments that were continuously accessible under both regimes, namely savings accounts and life insurance policies. If we find that East Germans exhibit only gradual adjustments to continuously accessible instruments, as do West Germans with respect to all instruments (continuously available to them), then the (near) jump of East Germans in securities and consumer debt can plausibly be linked to sudden access.

Initially, as the lower two panels of Figure 1 show, East German participation in savings accounts and life insurance policies exceeded that of West Germans, consistent with the popularity of these asset classes in the East.³⁶ These products became increasingly unpopular among both groups over our period of observation. For East Germans, the diminishing trend in participation was smooth, but went further than it did for West Germans: by the end of the period, East German participation in either product fell short of participation among West Germans. For life insurance, the shortfall of East German participation was particularly pronounced in the mid-2000s.

Thus, sudden access to securities and consumer credit did not produce a sudden exit from financial products previously held by East Germans, namely savings accounts and life insurance. The persistence in participation that we find in the bottom panel under continuous access is consistent with existing literature on inertia, as is the behavior of their West German counterparts who had continuous access to all products.

³⁶ It should be noted that life insurance policies in the East tended to be smaller in value and more targeted towards covering funeral expenses, compared to those typically held in the West.

Decompositions of covariate and coefficient effects highlight the importance of coefficient effects in accounting for these participation trends. In the bottom two panels of Figure 2, we see that coefficient effects account fully for the gradual elimination and eventual reversal of the difference in West-East participation in savings accounts. Coefficient effects also play an important role in the diminution of participation differences in life insurance, although there is a small contribution of covariate effects to higher participation rates among West Germans. This small contribution remains stable over the period of observation and does not account for the gradual diminution of participation by East Germans.

All in all, East Germans took advantage of newly accessible financial instruments, securities and consumer debt, quickly, but they reduced their participation in continuously available instruments, savings accounts and life insurance, only gradually and for reasons largely unrelated to the evolution of their characteristics relative to those of West Germans following reunification. While inertia with respect to continuously available instruments is consistent with existing literature on participation inertia, our findings suggest that jumps or very fast adjustments are possible when households suddenly gain access to financial instruments through a knowledgeable and well-incentivized financial sector. We conjecture that well-publicized sudden access focuses their attention on the new products, while the knowledgeable financial sector provides the necessary guidance.

5. Probing into sudden access further: Finer decompositions and additional characteristics

We now seek to shed additional light into the striking new result on sudden access to financial instruments. First, we decompose the covariate effects into three subsets of

variables, in order to understand potentially conflicting influences of characteristics on relative participation of West and East Germans that may be masked by the combined effects. Secondly, we will examine whether part of the differences assigned to coefficient effects by our benchmark specification can be explained by some further characteristics (covariates) stressed in the participation literature but not incorporated into our benchmark analysis for reasons of data availability.

5.1. A finer decomposition of covariate effects

In Section 4.3., we find that differences in household characteristics, taken as a whole, explain participation differences between West and East Germans in securities fully, but play hardly any role in explaining differences in consumer debt. Given the variety of characteristics for which we are able to control, it is useful to look further into these and distinguish among groupings of characteristics. We consider the following three groups of household characteristics:

- a. *Demographics*: gender, age, marital status, number of adults, and number of children
- b. *Resources*: log income, home ownership, occupation, education
- c. *Sentiment*: concerns about the economy in general, concerns about the own economic situation, and log income of peer group.

Figure 3 decomposes covariates into these three categories and then computes the covariate effects associated with each category. We perform the decomposition of covariate effects as follows (full details are in the Appendix. We draw a sample of West German households equal in number to the sample of East Germans we have. We use East German values (from randomly assigned households) to replace only the demographic characteristics included in (a), leaving all other characteristics at their

West German values. We then compute and plot the covariate effects for participation differences between this constructed sample of “hybrid” West Germans and the sample of East Germans. These are shown as circles in Figure 3. We then restore the full set of West German characteristics and replace only those under “Resources” with corresponding characteristics of East Germans. We use this second collection of “hybrid” West Germans and the sample of East Germans to compute the covariate effects associated with resources. We indicate those as diamonds on the graphs. Finally, we restore West German characteristics once again and repeat the exercise with the sentiment variables. The covariate effects computed in this way are plotted as squares.³⁷

The upper left panel of Figure 3 indicates the relative contributions of the three groups of variables in generating the positive covariate effects in favor of West German participation in securities following reunification that fully explain the observed gap in West-East participation. The pattern of the plots confirms what one might expect, namely that West Germans were more likely to participate in securities mainly because of their superior resources, while demographic covariates were pushing in the opposite direction for most of the observation period. Interestingly, the estimated role of sentiment variables suggests that these contributed to greater West German participation in the first half of the observation period, but after the turn of the century they played a much smaller role and, if anything, in the direction of encouraging greater participation by East rather than West Germans.

The upper right panel of Figure 3 goes beyond the overall zero estimated covariate effects for participation in consumer debt and suggests that sentiment variables (squares) were pushing for greater participation among East rather than among West Germans, but were largely neutralized by resources being less conducive to getting

³⁷ Note that results do not add up exactly to the total estimated covariate effects for reasons indicated in the Appendix.

consumer credit (diamonds in the figure). Two of the sentiment variables relate to concerns about the own and the general economic future, and both are positively linked to debt participation for both West and East Germans, though the coefficient on the question of concerns about the general economic development is not significant for the latter. Another one of the sentiment variables is average peer income, which has tended to be higher than own income for East Germans faced with new peers from the West. As mentioned above, in our regressions of participation in consumer credit (Tables 4 and 5), relative income of peers bears a positive and statistically significant relationship to debt participation, consistent with existing literature on peer effects.

The bottom two panels of Figure 3 provide an illustrative decomposition of participation differences in previously accessible assets that are attributable to covariates. This suggests that the overall pattern of any existing covariate effects is primarily attributable to resource variables. This notwithstanding, sentiment variables (including peer income) are particularly conducive to East German participation in life insurance policies throughout the period of observation. This would be consistent with an interest of East Germans in relative living standards even in the event of premature death of the major income earner.

5.2. Robustness: further household characteristics

By definition, coefficient effects capture differences in West-East behavior controlling for observable characteristics. A positive approach interprets them as reflecting differences in how observable characteristics are linked to behavior. A skeptical approach considers them as unexplained differences. In this section, we make use of some additional observable characteristics, which are available only for a small subset of survey waves, and we examine whether and how inclusion of these

characteristics changes our estimates of coefficient and covariate effects for the years in which they are available.

Tables 6 and 7 present new estimates of coefficient and covariate effects, alongside the corresponding benchmark estimates, after including as characteristics variables reflecting preferences towards financial risk, general risk taking, sociability, and trust. The literature has documented some differences in risk aversion, trust, and sociability between East and West Germans (see e.g. Heineck and Süßmuth, 2013, Rainer and Siedler, 2009, Dohmen et al., 2011, Bauernschuster et al., 2011). For each of the three years in which at least one of these variables is reported (2003, 2004, 2008), we include as many of these variables as available and recompute coefficient and covariate effects, as well as their 95% confidence intervals through bootstrapping.

For 2003, we observe sociability and trust. The trust controls are comprised of a set of three categorical dummy variables that capture whether the respondent strongly agrees, agrees, disagrees, or strongly disagrees (with one omitted category) to the statement: “On the whole one can trust people”. This concept of trust is analogous to what is typically analyzed in the trust literature (e.g., see Guiso, Sapienza, and Zingales, 2008). The sociability variable is a continuous variable that measures how many self-reported close friends a respondent has.³⁸ Sociability has been found to correlate with higher stock market participation (Hong, Kubik, and Stein, 2004), consistent with fixed-cost participation models and with recent work on peer effects that stresses the importance of knowledge transfer from peers alongside possible imitation or “endorsement” of peer behavior.³⁹ As Tables 6 and 7 show, inclusion of these variables in the regressions for securities and for consumer debt shifts some mass from estimated

³⁸ Sociability has also been analyzed in the context of its expression in self-reported activities (such as church going, voluntarism, etc.). The sociability measure available in our data is more direct and arguably less culturally biased.

³⁹ See Banerjee et al. (2013), Bursztyn et al. (2014), Bailey et al. (2018), Haliassos et al. (2019).

coefficient effects towards covariate effects, without changing the sign or significance of either. In other words, trust and sociability are confirmed as being relevant for financial behavior, but their omission in the years for which the data are not available is unlikely to influence our perception of the sign or magnitudes of coefficient or covariate effects.

In the third and fourth rows of Tables 6 and 7, we report estimates for 2004, when a measure of financial risk preferences is available (but not the trust and sociability measures). The financial risk variable is measured as the answer, on a scale from 0 to 10, to the question: “How would you rate your willingness to take risks in financial matters?”. 0 means extremely risk averse and 10 means “fully prepared to take risk”. We convert the answers into 10 categorical dummy variables (with one omitted category). Inclusion of this additional control for willingness to take financial risks leaves our benchmark estimates of coefficient and covariate effects for 2004 virtually unchanged.

In 2008 (fifth and sixth rows of the tables), the sociability and trust variables are again available, but this time we can also observe self-reported preferences towards general (as opposed to financial) risk taking. Specifically, general risk attitude is measured as the answer, on a scale from 0 to 10, to the question “Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” We follow the same procedure as for financial risk. Inclusion of these three variables shifts some mass from coefficient to covariate effects only in the case of securities and by an amount even smaller than what we found for 2003, despite the additional inclusion of the risk aversion variable.

All in all, our experimentation with additional controls, when available, shows that our benchmark results are quite robust, both in terms of sign and of size, with additional variables rendering only a small reduction in “unexplained” coefficient effects.

6. Concluding Remarks

This paper employs the “experiment” of German reunification and several waves of GSOEP data to study how sudden access to previously unavailable financial products through a well-motivated financial sector, experienced in those products, influences participation both in the newly available financial products and in previously available ones. West-East differences in behavior are analyzed for previously unavailable instruments to East Germans (securities and consumer debt) and for accessible ones (savings accounts and life insurance).

We estimate time-varying West-East differences in participation behavior and analyze how these are related to the different configurations of characteristics in the two subpopulations (covariate effects) versus different relationships between given characteristics and behavior (coefficient effects). We then probe further into each of those. On covariate effects, we distinguish the roles of covariates related to household resources, demographics, and sentiment including peer comparisons. On coefficient effects, we examine whether significant parts of our estimates can be explained through further data on characteristics available only for some survey waves.

In the raw data, East Germans exhibit higher participation in consumer debt and lower one in securities than West Germans. For assets previously accessible to East Germans, we find greater participation rates, both initially and for a number of years following reunification, but eventually they drop below participation rates of West Germans. We confirm econometrically links of asset and debt participation to

household characteristics typically stressed in the existing participation literature, as well as substantial participation inertia in previously available financial products, consistent with existing literature on such inertia and inattention.

We present a number of striking new findings. First, controlling for their characteristics, East Germans experienced a jump in securities participation immediately following reunification to a level comparable to that of West Germans. Thus, lack of previous access to these assets did not prevent East Germans to make use of them as much as their West German counterparts, as soon as they became available. Second, they experienced (either a jump or) a dramatic increase in participation in previously inaccessible consumer debt, from zero to levels above those of West Germans, even controlling for differences in characteristics. These two findings on abrupt changes in participation following sudden access are new to the participation and portfolio inertia literature. Third, East Germans did exhibit portfolio inertia by gradually reducing their participation in previously available assets (savings accounts and life insurance) even in the face of such rapid adjustment to newly available financial instruments. The combination of the two findings suggests that sudden access on a broad scale and through an experienced financial sector can induce participation jumps among people who exhibit portfolio inertia with respect to continuously available financial instruments. Fourth, overall covariate effects may be estimated as small or insignificant, but different aspects of household characteristics may still play an interesting, albeit conflicting, role. Lower resources are a strong driving factor of lower participation in the East, but are, in the case of consumer debt, counteracted by differences in expectations and peer income that predict significantly higher participation. Fifth, average income among the newly established group of West and East German peers following reunification has had a larger effect on East German than

on West German financial behavior. The asymmetric finding on consumer debt is consistent with recent peer effects literature and the fact that a greater share of East German households had labor incomes below the average of their peers. Sixth, occasionally available data on attitudes towards financial or general risk, trust, and sociability bear relationships to participation consistent with existing literature, but they hardly influence the estimated size of coefficient effects that we have presented.

Stockholding and consumer debt are both risky financial instruments. Households jeopardize their wealth and risk financial distress through inappropriate use of either of these. Suddenly opening up access to such risky instruments for people who have not held them before, and who were subjected to systematic propaganda against them or otherwise impeded in knowledge acquisition, could have resulted in financial disasters and over-indebtedness. Continued participation, as well as available evidence on financial distress indicators, suggest that this did not happen on any noticeable scale.

Received wisdom on widespread portfolio inertia might have led us to expect only gradual take-up of newly accessible financial instruments, or very rapid retreat after premature entry. Neither was observed in this unusual counterfactual of sudden access and a knowledgeable and well-incentivized financial sector. The budding study of regulation of household financial behavior may find this to be useful input for striking the right balance between limiting household product access and ensuring the soundness of financial sector incentives and practices in financial innovation.

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Appendix: Notes on the decomposition of covariate effects

We decompose the covariate effect into three components:

- d. *Demographics*: gender, age, marital status, number of adults and number of children;
- e. *Resources*: log income, homeownership, occupation, education;
- f. *Sentiment*: concerns about the economy in general, concerns about the own economic situation, and log income of peer group.

In order to construct observations that differ between East and West only with respect to the chosen covariate grouping we take the following steps:

- a. Draw as many West German observations with replacement as we have original East German observations
- b. Randomly match each West German observation with an East German observation
- c. Replicate these pairs three times, so that the matching remains the same across changes in subsets of characteristics (demographics or resources or sentiment)
- d. For each West German observation drawn, replace only the relevant attributes (one of: demographics or resources or sentiment) with the corresponding attributes of the East German counterpart in the pair

Example: For the demographics segment, we keep all resources and sentiment variables at their West German values, while replacing the demographics variables with the respective East German values.

We can call this a “hybrid observation”, as it synthesizes characteristics from a West and an East German household.

- e. With each sample of hybrid observations, we predict the participation rates after running the probits on the full West German sample, and we calculate the average over all hybrid households.
- f. We then repeat the exercise 100 times with a new random draw of West German observations and a new random match between East and West German households each of the 100 times, to ensure that our results are not driven by the peculiarities of a specific random matching.
- g. We subsequently use the mean of the average predicted participation rates across the 100 repetitions to calculate the covariate effect, as the difference between the average participation rate in West Germany and the mean of the average predicted participation rates of the hybrid observations. We apply East weights to the entire hybrid observations in order to weight properly the subset of characteristics taken from the East sample in computing the covariate effect.

Overall, this decomposition serves as an illustration of what roles the three different sets of covariates (demographics, resources, sentiment) may play in the total covariate effect. Note that the three “partial” covariate effects do not necessarily add up to the total covariate effect. This is due to two reasons:

- a. As a result of the nonlinear nature of probit, the matching of East and West German observations (despite being random and using 100 repetitions) affects the predicted participation rates. The constructed (hybrid) observations are not designed to incorporate any typical relationship across covariate segments that exists in the true East German population, and this affects the predicted participation probabilities. By contrast, such relationships are automatically present when using the full set of covariate values for observations from East Germany.
- b. Secondly, despite running unweighted probits, we use weights (as laid out above) to calculate the predicted participation rate of the hybrid observations. By attaching East German weights to the hybrid observations, we also end up using these weights for the non-replaced covariates coming from the West German household sample. This introduces some difference between the average participation probabilities of West Germans (which weight all West German characteristics with West German weights) and the average participation probabilities of the constructed (hybrid) households. This difference reflects the use of East German population weights on the full set of characteristics of each hybrid household rather than differences in the values of the covariates. This difference may also prevent the estimated covariate effects for each group of characteristics from adding up to the total covariate effect.

TABLE 1: Consumer Debt Servicing Ratio (monthly)

Year	Mean		Median	
	West	East	West	East
1997	0.1705	0.1475	0.1271	0.1191
1998	0.1715	0.1339	0.1250	0.1090
1999	0.1652	0.1467	0.1269	0.1178
2000	0.1685	0.1480	0.1316	0.1178
2001	0.1582	0.1449	0.1214	0.1194
2002	0.1550	0.1495	0.1244	0.1202
2003	0.1608	0.1496	0.1250	0.1200
2004	0.1671	0.1474	0.1294	0.1250
2005	0.1403	0.1548	0.1105	0.1167
2006	0.1307	0.1380	0.1064	0.1154
2007	0.1461	0.1406	0.1000	0.1129
2008	0.1384	0.1523	0.0962	0.1056
2009	0.1268	0.1347	0.0980	0.1066

Note: This table contains the ratio of consumer debt repayments to net household income (both at monthly frequency), conditional on having positive consumer debt. The first two columns show the mean by year over all West/East German households, the next two columns the median by year. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 2: Securities Participation Regressions, West Germans

Dependent variable:	Securities participation	
	(i)	(ii)
peer income (log)	-0.057 (0.0445)	-0.057 (0.0444)
income growth		0.0586 *** (0.0052)
income (log)	0.2054 ***	0.2261 ***
male	0.017 **	0.0153 *
age 35-49	-0.008	-0.005
age 50-65	-0.016	-0.009
age 66+	-0.035 **	-0.026 *
married	-0.004	-0.004
separated/divorced	-0.064 ***	-0.063 ***
2 adults	-0.054 ***	-0.057 ***
3+ adults	-0.124 ***	-0.13 ***
1-2 children	-0.051 ***	-0.051 ***
3+ children	-0.131 ***	-0.132 ***
retired	0.0521 ***	0.0518 ***
unemployed	0.024 **	0.0218 *
not in labor force	0.1082 ***	0.1018 ***
apprentice	-0.004	-0.019
self employed	0.0381 ***	0.0311 **
white collar in financial sector	0.2708 ***	0.2638 ***
white collar in non-financial sector	0.0948 ***	0.0905 ***
civil servant	0.0682 ***	0.062 ***
completed high school	0.1209 ***	0.1182 ***
completed college	0.2366 ***	0.226 ***
own house	0.0894 ***	0.0868 ***
very concerned about general econ. development	-0.002	-0.002
very concerned about own econ. development	-0.094 ***	-0.091 ***
state-year fixed effects	yes	yes
pseudo R-squared	0.1538	0.1566
observations	87708	87708

Note: This table represents marginal effects from a probit regression of securities market participation on relevant characteristics, using the West German sample 1991-2007. Column (ii) adds income growth as an explanatory variable to the regression of column (i). Marginal effects are constructed keeping all other variables at their actual levels and averaging over all individuals. Peer income and income growth are constructed as described in the main text. Standard errors are clustered at the household level and reported in parentheses. *** indicates significance at the 1 percent significance level, ** at the 5 percent level, and * at the 10 percent level. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 3: Securities Participation Regressions, East Germans

Dependent variable:	Securities participation	
	(i)	(ii)
peer income (log)	0.162 ** (0.0727)	0.1632 ** (0.0721)
income growth		0.0636 *** (0.0147)
income (log)	0.2286 ***	0.2556 ***
male	0.0327 ***	0.031 ***
age 35-49	-0.071 ***	-0.067 ***
age 50-65	-0.04 **	-0.032 *
age 66+	-0.075 ***	-0.066 ***
married	-0.018	-0.019
separated/divorced	-0.078 ***	-0.076 ***
2 adults	-0.054 ***	-0.06 ***
3+ adults	-0.088 ***	-0.098 ***
1-2 children	-0.021 **	-0.023 **
3+ children	-0.137 ***	-0.139 ***
retired	0.0128	0.0136
unemployed	0.0155	0.0157
not in labor force	0.0677 ***	0.0615 **
apprentice	0.0389	0.0341
self employed	0.0184	0.0116
white collar in financial sector	0.1405 ***	0.1287 ***
white collar in non-financial sector	0.0285 **	0.0241 *
civil servant	-0.042	-0.052 **
completed high school	0.0642 ***	0.062 ***
completed college	0.1136 ***	0.1053 **
own house	0.0287 ***	0.0269 ***
very concerned about general econ. development	-0.007	-0.007
very concerned about own econ. development	-0.064 ***	-0.061 ***
state-year fixed effects	yes	yes
pseudo R-squared	0.1435	0.1477
observations	37842	37842

Note: This table represents marginal effects from a probit regression of securities market participation on relevant characteristics, using the East German sample 1991-2007. Column (ii) adds income growth as an explanatory variable to the regression of column (i). Marginal effects are constructed keeping all other variables at their actual levels and averaging over all individuals. Peer income and income growth are constructed as described in the main text. Standard errors are clustered at the household level and reported in parentheses. *** indicates significance at the 1 percent significance level, ** at the 5 percent level, and * at the 10 percent level. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 4: Consumer Debt Participation Regressions, West Germans

Dependent variable:	Consumer debt participation	
	(i)	(ii)
peer income (log)	0.1457 *** (0.0381)	0.1451 *** (0.0381)
income growth		0.0067 * (0.004)
income (log)	0.0592 ***	0.0617 ***
male	0.0093	0.0091
age 35-49	-0.058 ***	-0.058 ***
age 50-65	-0.1 ***	-0.099 ***
age 66+	-0.153 ***	-0.152 ***
married	0.0102	0.0101
separated/divorced	0.0527 ***	0.0528 ***
2 adults	0.0143 *	0.014 *
3+ adults	0.0219 **	0.0211 **
1-2 children	0.0206 ***	0.0205 ***
3+ children	0.0403 ***	0.0401 ***
retired	-0.094 ***	-0.094 ***
unemployed	-0.068 ***	-0.068 ***
not in labor force	-0.077 ***	-0.078 ***
apprentice	-0.05 *	-0.051 **
self employed	-0.015	-0.015
white collar in financial sector	-0.036 **	-0.037 **
white collar in non-financial sector	-0.022 ***	-0.023 ***
civil servant	0.0015	0.0007
completed high school	-0.028 **	-0.028 **
completed college	-0.123 ***	-0.123 ***
own house	-0.066 ***	-0.066 ***
very concerned about general econ. development	0.0186 ***	0.0185 ***
very concerned about own econ. development	0.0569 ***	0.0571 ***
state-year fixed effects	yes	yes
pseudo R-squared	0.1126	0.1127
observations	66885	66885

Note: This table represents marginal effects from a probit regression of consumer debt participation on relevant characteristics, using the West German sample 1997-2007. Column (ii) adds income growth as an explanatory variable to the regression of column (i). Marginal effects are constructed keeping all other variables at their actual levels and averaging over all individuals. Peer income and income growth are constructed as described in the main text. Standard errors are clustered at the household level and reported in parentheses. *** indicates significance at the 1 percent significance level, ** at the 5 percent level, and * at the 10 percent level. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 5: Consumer Debt Participation Regressions, East Germans

Dependent variable:	Consumer debt participation			
	(i)		(ii)	
peer income (log)	0.2147	***	0.2142	***
	(0.079)		(0.079)	
income growth			0.0082	
			(0.0056)	
income (log)	0.0694	***	0.0727	***
male	0.0014		0.0012	
age 35-49	-0.076	***	-0.075	***
age 50-65	-0.126	***	-0.125	***
age 66+	-0.181	***	-0.18	***
married	0.0467	***	0.0465	***
separated/divorced	0.0476	***	0.0477	***
2 adults	0.0447	***	0.0441	***
3+ adults	0.0763	***	0.0752	***
1-2 children	0.0235	**	0.0233	**
3+ children	0.0337		0.0332	
retired	-0.13	***	-0.13	***
unemployed	-0.108	***	-0.108	***
not in labor force	-0.09	***	-0.091	***
apprentice	-0.06	*	-0.06	*
self employed	-0.055	***	-0.056	***
white collar in financial sector	0.0137		0.012	
white collar in non-financial sector	-0.031	**	-0.031	**
civil servant	-0.034		-0.036	
completed high school	-0.037		-0.037	
completed college	-0.13	***	-0.13	***
own house	-0.049	***	-0.049	***
very concerned about general econ. development	0.0069		0.0069	
very concerned about own econ. development	0.0592	***	0.0595	***
state-year fixed effects	yes		yes	
pseudo R-squared	0.1149		0.1149	
observations	28572		28572	

Note: This table represents marginal effects from a probit regression of consumer debt participation on relevant characteristics, using the East German sample 1997-2007. Column (ii) adds income growth as an explanatory variable to the regression of column (i). Marginal effects are constructed keeping all other variables at their actual levels and averaging over all individuals. Peer income and income growth are constructed as described in the main text. Standard errors are clustered at the household level and reported in parentheses. *** indicates significance at the 1 percent significance level, ** at the 5 percent level, and * at the 10 percent level. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 6: Coefficient and Covariate Effects with Additional Controls in Selected Years, Securities Participation

	Year	coefficient effect	covariate effect
benchmark	2003	0.2 (-1.26 ; 1.6)	7.4 (5.96 ; 8.83)
w/ sociability and trust	2003	0.1 (-1.61 ; 1.76)	7.5 (5.81 ; 9.18)
benchmark	2004	0.7 (-1.65 ; 3)	7.5 (5.15 ; 9.8)
w/ financial risk preferences	2004	0.6 (-1 ; 2.65)	7.5 (5.49 ; 9.14)
benchmark	2008	4.1 (1.96 ; 5.95)	8.3 (6.35 ; 10.34)
w/ sociability, trust and general risk preferences	2008	4.0 (2.16 ; 6.22)	8.3 (6.09 ; 10.14)

Note: This table represents coefficient and covariate effects for selected years for the benchmark specification and specifications including controls for social capital, trust, and risk preferences. 95% confidence bands are bootstrapped and are shown in parentheses. The trust controls are comprised of a set of three categorical dummy variables that capture whether the respondent strongly agrees, agrees, disagrees, or strongly disagrees (with one omitted category) to the statement: "On the whole one can trust people". The general risk attitude is measured as the answer on a scale from 0 to 10 to the question "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? 0 means risk averse and 10 means fully prepared to take risk". We convert the answers into 10 categorical dummy variables (with one omitted category). The financial risk variable is built correspondingly relating to the question: "How would you rate your willingness to take risks in financial matters?". The sociability variable is a continuous variable that measures the self-reported number of close friends of the respondent. "East" and "West" refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

TABLE 7: Coefficient and Covariate Effects with Additional Controls in Selected Years, Consumer Debt Participation

	Year	coefficient effect	covariate effect
benchmark	2003	-6.7 (-7.97 ; -5.2)	-0.4 (-1.83 ; 0.95)
w/ sociability and trust	2003	-6.4 (-7.91 ; -5.02)	-0.6 (-2.01 ; 0.88)
benchmark	2004	-8.3 (-9.85 ; -6.13)	0.6 (-1.52 ; 2.2)
w/ financial risk preferences	2004	-8.3 (-9.95 ; -6.35)	0.6 (-1.3 ; 2.3)
benchmark	2008	-7.4 (-8.69 ; -5.93)	0.4 (-1.04 ; 1.73)
w/ sociability, trust and general risk preferences	2008	-7.2 (-8.34 ; -5.74)	0.2 (-1.22 ; 1.38)

Note: This table represents coefficient and covariate effects for selected years for the benchmark specification and specifications including controls for social capital, trust, and risk preferences. 95% confidence bands are bootstrapped and are shown in parentheses. The trust controls are comprised of a set of three categorical dummy variables that capture whether the respondent strongly agrees, agrees, disagrees, or strongly disagrees (with one omitted category) to the statement: “On the whole one can trust people”. The general risk attitude is measured as the answer on a scale from 0 to 10 to the question “Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?” 0 means “extremely risk averse” and 10 means “fully prepared to take risk”. We convert the answers into 10 categorical dummy variables (with one omitted category). The financial risk variable is built correspondingly relating to the question: “How would you rate your willingness to take risks in financial matters?”. The sociability variable is a continuous variable that measures the self-reported number of close friends of the respondent. “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

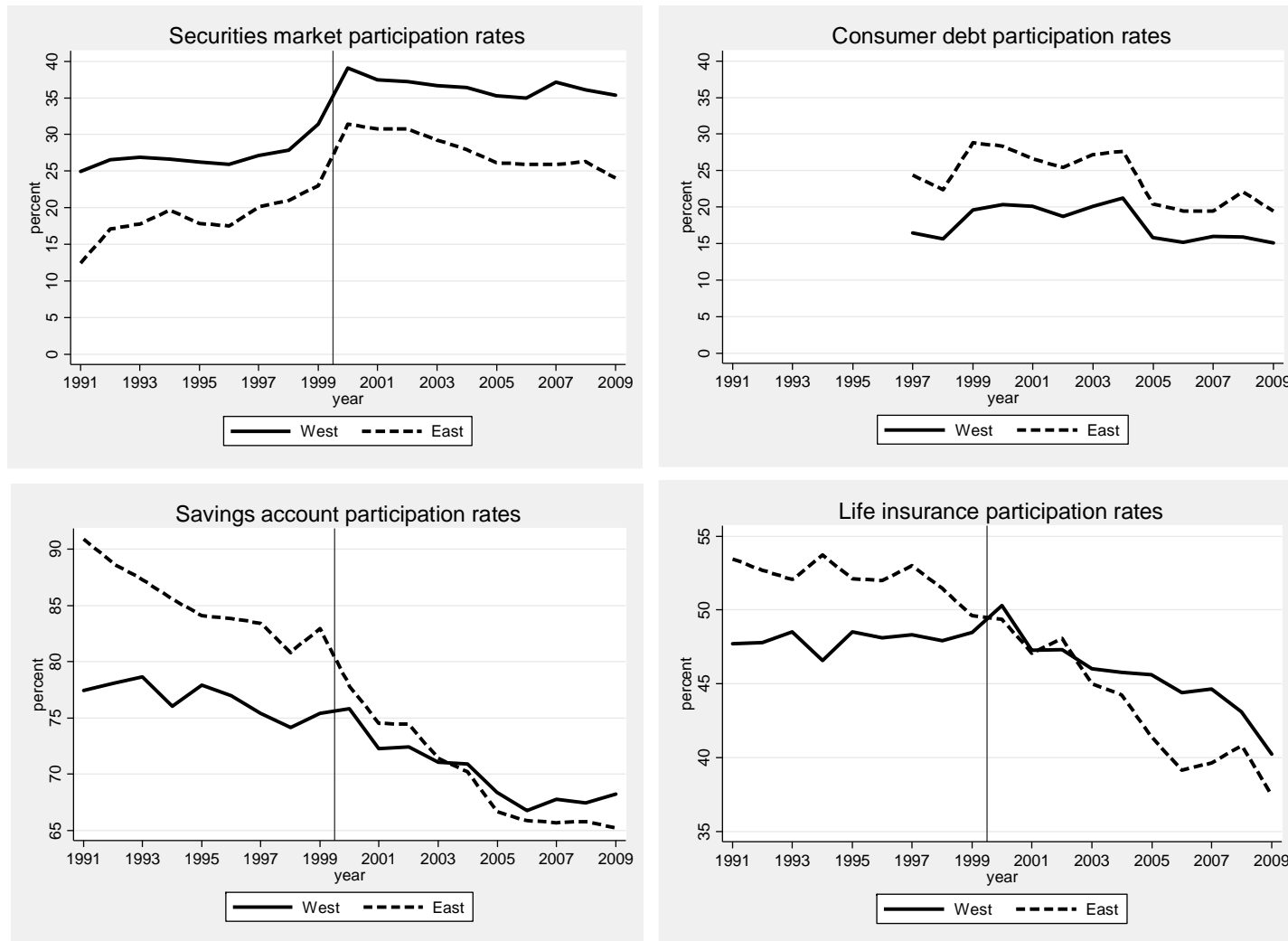


Figure 1: Observed participation rates in each financial instrument by year, West Germans versus East Germans.

Source: Computed by the authors using GSOEP data. Note: “East” and “West” refer to households who declare living in Germany or in West Germany, respectively, prior to reunification in 1989.

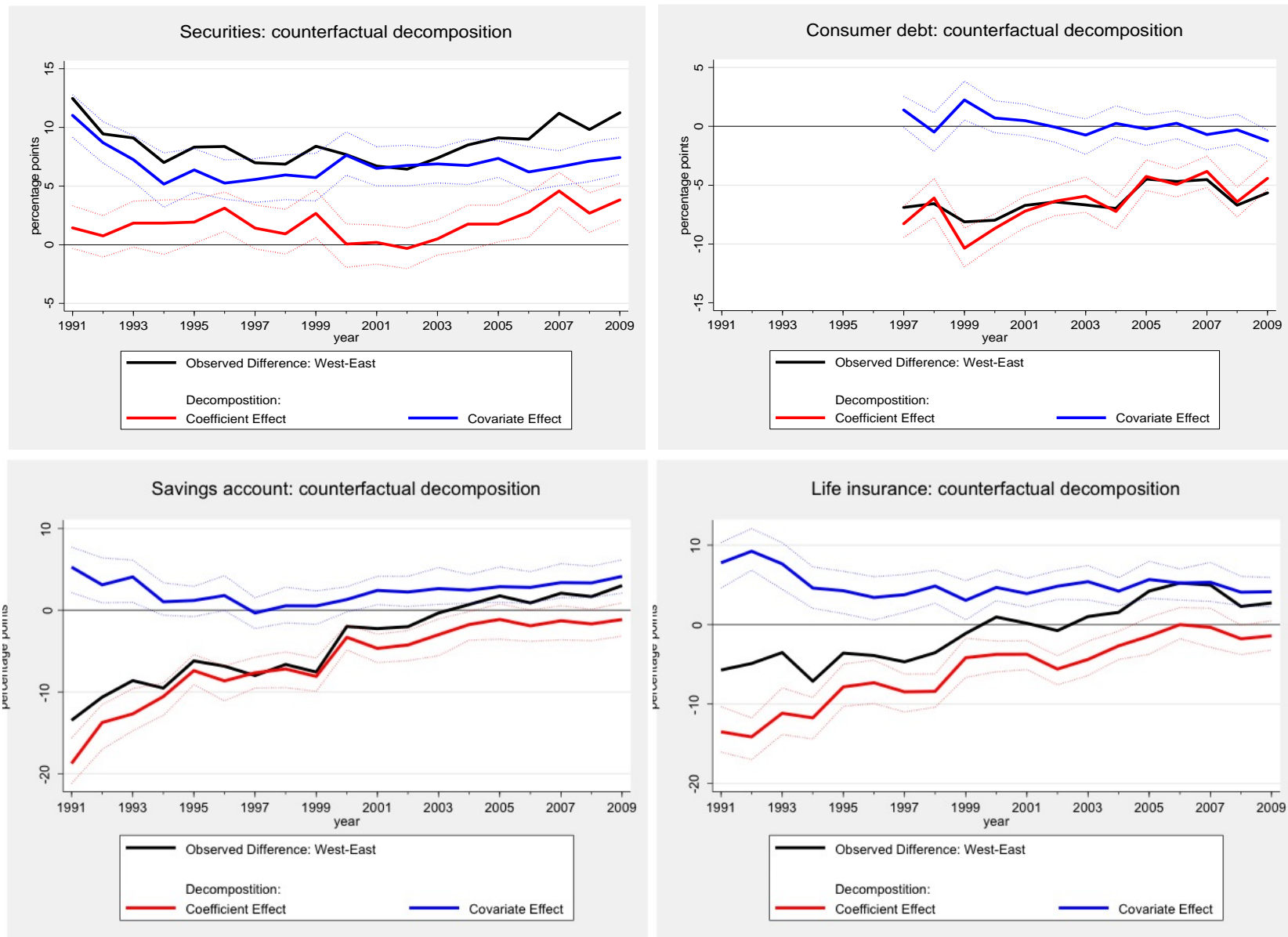


Figure 2: Decomposition of West-East German participation differences into coefficient and covariate effects. For method, see Section 4.2. Note: “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.

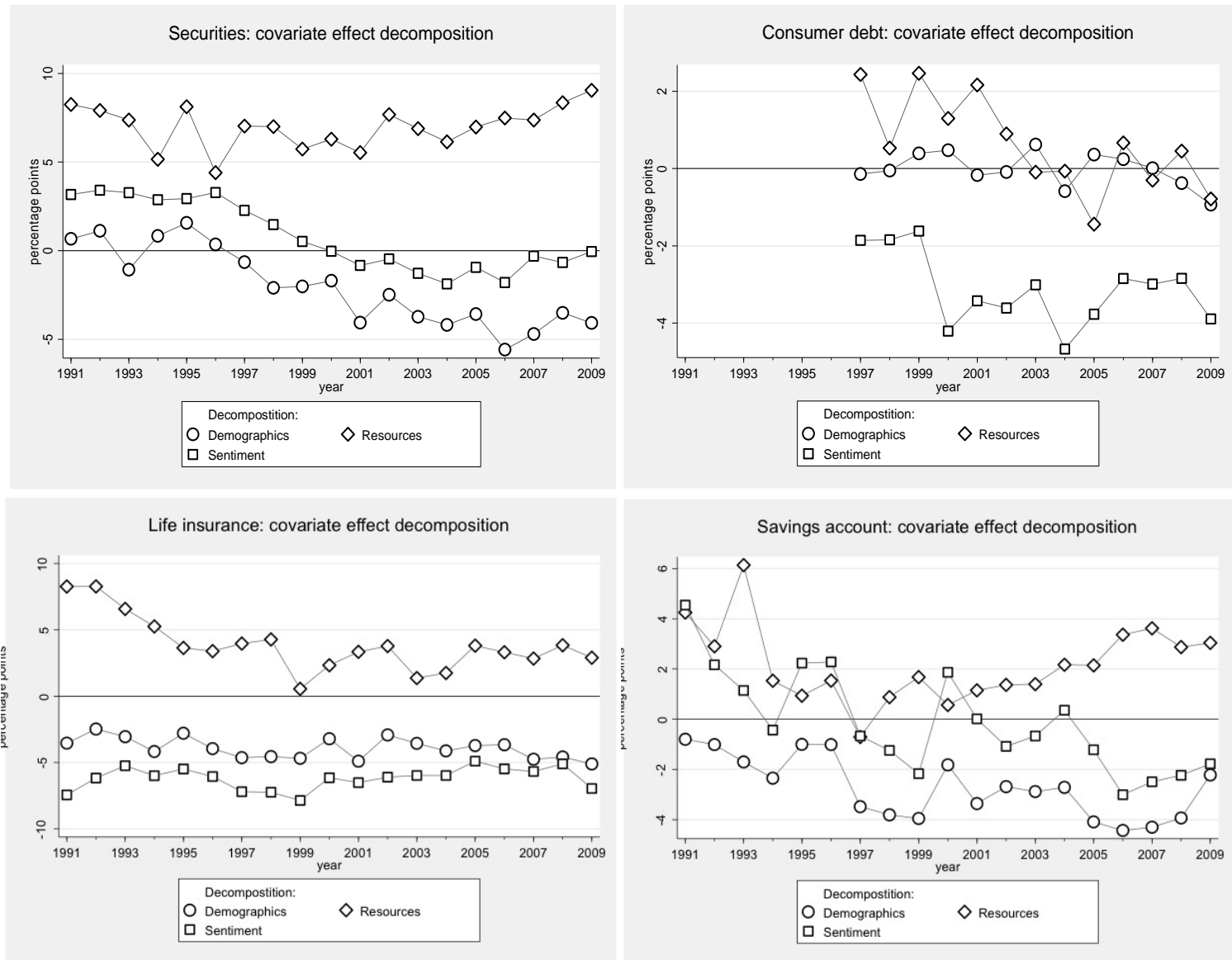


Figure 3: Decomposition of covariate effects in West-East German participation differences in various instruments Sub-components arising from demographic, resource, and sentiment variables, respectively. For method, see Appendix A. Note: “East” and “West” refer to households who declare living in East Germany or in West Germany, respectively, prior to reunification in 1989.