

Coppola, Michela; Börsch-Supan, Axel

Conference Paper

The German SAVE Study: Design, selected results and future developments

Beiträge zur Jahrestagung des Vereins für Socialpolitik 2011: Die Ordnung der Weltwirtschaft: Lektionen aus der Krise - Session: Wealth Surveys in Germany: New Perspectives for Research on Household Finance and Wealth, No. F15-V1

Provided in Cooperation with:

Verein für Socialpolitik / German Economic Association

Suggested Citation: Coppola, Michela; Börsch-Supan, Axel (2011) : The German SAVE Study: Design, selected results and future developments, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2011: Die Ordnung der Weltwirtschaft: Lektionen aus der Krise - Session: Wealth Surveys in Germany: New Perspectives for Research on Household Finance and Wealth, No. F15-V1, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft

This Version is available at:

<https://hdl.handle.net/10419/48733>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

The German SAVE Study: Design, selected results and future developments

Axel Börsch-Supan, Michela Coppola

Mannheim Research Institute for the Economics of Aging (MEA)

Abstract: Understanding how households form their long-term saving and investment decisions to shoulder risks not covered by social security systems has been of primary importance in all the countries which, like Germany, introduced major reforms to face the challenges of an aging population. This paper documents the scientific background and the design of the SAVE survey, a panel study developed in 2001 aimed at analyzing households' saving behaviour. Few selected results of particular relevance for the analysis of the private old-age provision in Germany are also presented. Ultimately, the future development of the SAVE-project is sketched. It will contribute to answer the new questions that challenge researchers as well as policymakers, after the financial crisis and now that the reforms of the social system in Germany have been implemented.

Acknowledgments: The SAVE survey has been funded by Deutsche Forschungsgemeinschaft (DFG, the German National Sciences Foundation) through the Sonderforschungsbereich 504, dedicated to Mannheim University's Program on Behavioral Economics. We are extremely grateful for the generous and long-term support by DFG.

1. Introduction

Understanding how people make long-run decisions, especially provisions for old age, is a question of central importance to scientists such as economists and psychologists. The ongoing reform of the pension system and the introduction of participant-managed defined contribution plans in Germany as well as in many other western countries make these questions even more important for policymakers, who need to correctly understand the saving behavior of households to design successful policies.

Economic theory gives a lot of structure to understand saving behavior, summarized in this chapter. Nonetheless, many questions remain unanswered by current saving theories. That is, why we need the more modest attitude and first collect data, observe actual behavior, and learn from what we have observed.

In Germany, the data situation for analyzing households' financial behavior has been particularly limited, as the existing databases do not record detailed data on both financial variables (such as income, savings and asset holdings) and sociological and psychological characteristics. For example, the German Socio-Economic Panel (GSOEP), a yearly panel maintained by the German Institute for Economic research (*DIW*), contains rich data on households' behavior, and some binary indicators of saving and asset choices, but it covered the quantitative composition of households' asset only in 2002 and 2007, making it difficult to track in detail changes in the asset portfolios or in the amount of wealth. The official Income and Expenditure survey (*Einkommens- und Verbrauchsstichprobe, EVS*) conducted by the Federal Statistical Office, offers detailed quantitative information on income, expenditure and wealth, but it has no information on psychological and behavioral aspects of the households, the survey is conducted only every five years, the sample is non-random and has no panel structure.

The SAVE survey, initiated in 2001 and produced by the Mannheim Research Institute for the Economics of Aging (MEA), aims to bridge this gap. It collects detailed quantitative information on traditional variables (such as income, earnings and asset holdings) as well as the relevant socio-psychological aspects of a representative sample of German households. The richness of the data, as well as the extremely short time after which the data are made available for analysis to the research community, make the SAVE survey a unique and particularly appropriate source of up-to-date information to better understand saving behavior and to tailor public policies.

2. The questionnaire

Designing a questionnaire is particularly difficult for the highly sensitive items in household finances. The main variables of interest in the SAVE survey, such as household wealth and indebtedness, are even from a theoretical point of view hard to quantify. For normal households, financial concepts are often unclear or very complicated. Hence, the researchers at the Mannheim Research Institute for the Economics of Aging (MEA) spent a long time and used all available experience to structure and phrase questions in a way to avoid respondents from giving wrong answers or, in the worst case, to quit the interview.

We departed from the survey instruments and the experiences made by other surveys, most significantly the U.S. Survey of Consumer Finances (SCF), the Banca d'Italia Survey on Household Income and Wealth (SHIW), the Dutch CentERpanel, and the U.S. Health and Retirement Study (HRS). For household composition and similar socio-economic background variables, we consulted the German Socio-Economic Panel (GSOEP). The "Soll und Haben" survey has been used to refine certain wordings of questions and their associated answering scales.

Researchers at MEA then cooperated with the Mannheim Center for Surveys, Methods and Analyses (ZUMA), TNS Infratest Social Research (Munich), Psychonomics (Cologne) and Sinus (Heidelberg) to optimize the wording of the questions in terms of an intuitive correct understanding.

The result of this effort was questionnaire designed such that the interview does not exceed 45 minutes on average. It consists of six parts, briefly summarized in table 1. In the wave 2009 the questionnaire has been considerably extended with two extra modules (module *3a* and *5a* in table 1) aimed at providing researchers with relevant data to specifically analyze possible causes and effects of the financial crisis that developed in 2008.

Table 1: Structure of the SAVE questionnaire

<i>Part 1:</i>	Introduction; determining which person will be surveyed in the household
<i>Part 2:</i>	Basic socio-economic data of the household; health questions (since 2005)
<i>Part 3:</i>	Qualitative questions on saving behavior, income and wealth
<i>Part 3a:</i>	Extended module on financial literacy and cognitive ability (new in 2009)
<i>Part 4:</i>	Quantitative questions on income and wealth
<i>Part 5:</i>	Psychological and social determinants of saving behavior
<i>Part 5a:</i>	Module on financial and economic crisis (new in 2009)
<i>Part 6:</i>	Conclusion: interview-situation

The first part consists of a short introduction that explains the purpose of the study and describes the precautions taken with respect to confidentiality and data protection. As the questionnaire deals with very personal topics, this introduction was considered important to make the respondent more comfortable with the sensitive questions. The part also ascertains the household's composition.

The second part asks questions on the socio-economic structure of the household such as age, education, and participation in the labor force. Since 2005, this part also inquires about the health situation of the respondent and his/her partner.

Part three contains qualitative and simple quantitative questions on saving behavior and on how the household deals with income and assets, including which type of investments are selected for one-off injections of cash, how regularly savings are made. It also includes questions about the subjective importance of several saving motives, about saving decision processes (specifically rules of thumb), attitudes towards consumption and money. An extra module (part 3a in table 1) has been added in the survey 2009: it extensively deals with respondents' degree of financial and cognitive ability, considerably extending the basics questions covering this topic included in previous versions of the survey.

The most critical part of the survey is the fourth part. It includes a comprehensive and detailed financial account of the household, touching therefore very sensitive items. Respondents are asked questions on their income from various sources, holdings of different assets, private and company pensions, ownership of property and business assets, and debt.

The survey instrument then eases out with questions about psychological and social factors. This fifth part concerns expectations about income, the subjective assessment of the economic situation of the household, health, life expectancy and general attitudes to life. The extra unit inserted in 2009 (part 5a in table 1) deals specifically with the financial and economic crisis with specific questions investigating households' investment strategies, saving plans, specific expectations and beliefs as well as their reactions to the fiscal packages implemented by the government in response to the crisis. Finally, the sixth part concludes with an open-ended question about the interview situation and general comments. At this point,¹ German law also requires that respondents are asked about their consent to keep their addresses to have the possibility of conducting a further survey in the future.

3. Sample design

The SAVE survey started in 2001 and 2003 with a set of experiments: in 2001 different interview modes were tested, while in 2003 it was investigated the willingness to participate in a long-term panel study on financial matters (Börsch-Supan and Essig, 2005).

The main scientific *SAVE Random Sample* started in 2003 (Figure 1) and after the refreshment in 2005, it has been conducted on a yearly base. The 2003 random sample of SAVE was drawn by a multiple stratified multistage random route procedure (Heien and Kortmann, 2003). Since this turned out to be costlier than expected, the *refreshment to the random sample* in 2005 used a large sample drawn from the community-based German population registers (“Einwohnermeldeamtsstichprobe”) in a multistage procedure.

At the same time, SAVE includes also a third sample, the so-called *TPI Access Panel*. It consists of a standing panel of household surveyed at regular intervals, operated by the company TNS Infratest TPI (Test Panel Institute, Wetzlar). The Access Panel is characterized by well-known response behavior and a well-defined distribution of core socio-demographic characteristics such as gender, residence in West or East Germany, age, marital status, household size, occupational status (employed, unemployed, pensioner) and professional status (employee, self-employed, civil servant), which mimic the distribution in the Mikrozensus. However the non-randomness in the sample selection might bias the distribution of other characteristics, such as the willingness to cooperate. Such unobserved

¹ This is, at the end of a tiring interview, of course not an ideal moment which leads to substantial initial attrition. The consensus for being contacted in the future, however, is asked only the first time the interview is conducted: in the following years the consensus is presumed and the question is not repeated. Therefore, since 2007, the question is not anymore in the questionnaire.

characteristics may be correlated with items of research interest, such as participation in state-sponsored old-age savings schemes, and hence create sample selectivity.

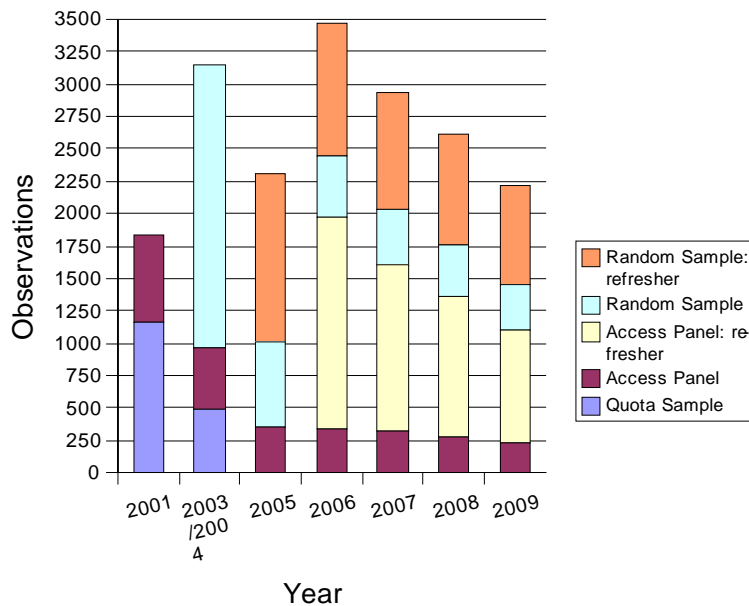


Figure 1: SAVE sample design

Past analyses reveal however a wide concordance of results between the three subsamples. We therefore continued the Access Panel with its higher willingness to participate in the panel, rather than doubling up the random sample, but keep the samples separate to retain the ability to further perform selectivity checks.

4. Response and cooperation rates

The cooperation rate in SAVE is above the European average although lower than in the United States.² That is typical for scientific surveys in Europe: the participation is much lower than in the USA and has dramatically declined over the recent years. The Italian Survey of Household Income and Wealth (SHIW), which can be at best compared with SAVE, had for example a peak response rate of 46.7% in 1995. It declined to 36.6% in 1998, 27.5% in 2000, and 25.7% in 2004.³ The new Spanish Survey of Household Finances (EFF) achieved a

² The ratio between the gross sample (*i.e.* all the households set to be interviewed) and the net sample (*i.e.* all the households actually interviewed) is called *response rate*. It contains neutral failures (such as invalid addresses) and non-neutral failures (such as refusal to participate) which potentially create selectivity biases. The ratio of completed interviews in the gross sample minus neutral failures is called *cooperation rate*.

³ See the Methodological Notes of the Banca d'Italia (1991 - 2006). The response rates refer to the refresher samples taken from 1989 through 2004.

response rate of 25.8% in 2002.⁴ In the U.S. American SCF, the response rate in 1995 was 66.3%, about the same in 1998, and slightly increased to 68.1% and 68.7% in 2001 and 2004, respectively.⁵ Other surveys in the U.S., for example the U.S. Health and Retirement Study (HRS), feature however a decline in response rates (from over 80% in the 1990s to about 69% in 2004).

In the first *SAVE 2003 Random Sample*, the strictly defined response rate was 45.8%, while the cooperation rate was 46.1% across the entire sample, see table 2.

Table 2: Unit response rate in the SAVE 2003 and 2005 random samples

	2003 Random Sample	2005 Refresher Sample
Sampling scheme	Random route	Population registers
Cooperation rate	46.1%	39.5%
Response rate	45.8%	35.4%

A possible explanation for the substantially lower response and cooperation rates in 2005 can be that potential respondents were asked to stay in a panel at least until 2008 even before we interviewed them in the first wave. We aimed this way at minimizing panel attrition at the expense of a lower initial response rate

Panel mortality, defined as the loss of observations from one wave to the other, includes actual mortality as well as other reasons such as the moving of a person to an unknown or unreachable destination, illness, refusal to further participate, etc. Since German law prescribes that at the end of wave, respondents have to be asked whether their address may be stored for potential future interviews, refusal may take place twice: at the end of an interview as well as before the beginning of a successive interview.

Panel attrition rates tend naturally to decrease over time, as reluctant respondents drop out of the sample in the first waves. The effect is well visible in the early Italian SHIW, where from 1989 to 1995 the panel response rate increased from 23.3% to 77.8%. In 2002 and 2004,

⁴ See Bover (2004). The response rate refers to the overall sample of the first wave in 2002.

⁵ See Kennickell and McManus (1993) and Kennickell (2000, 2003, and 2005). The response rates refer to the cross-sectional area probability samples taken in 1992 through 2004.

the panel response rate had stabilized at around 75%.⁶ While this natural selection improves the stability of the sample, it may induce self-selection bias, because people who remain in the sample may not be representative of people who drop out.

Table 3 shows the development of the panel and our learning process from 2003 to 2009. After the first interview in 2003, more than a third of the successful respondents refused to give permission to retain their addresses for future contact. Of those, who gave permission, only 47% successfully completed a second survey, while 13% dropped out “neutrally” and 36.7% refused after the break of two years.

Table 4: Retention in the SAVE panel: 2003 through 2009

	2003 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009
No permission to keep address	37.2%	11.6%	0.00%	0.00%	0.00%
Cooperation rate	57.9%	90.5%	91.0%	95.5%	92.3%
Response rate	50.4%	88.9%	89.6%	93.4%	90.7%

Note: rates refer to the Random Sample

Source: Heien and Kortmann (2005- 2009)

After the 2005 wave, we introduced small presents (value between 5 and 10€) and money (20 €) as incentives.⁷ Respondents were informed about the scientific results in a small brochure and received a greeting card for Easter. Moreover, new panel members were explicitly asked to be prepared to stay in the panel at least until 2008. The high response rates attained in the last waves of the survey and the stability of the sample size highlight the effectiveness of these strategies.

5. Item nonresponse

Beside the complete denial of an interview, respondents might prefer for various reasons not to answer some questions. For the vast majority of variables in SAVE, this is not a problem. For example, hardly anyone refuses to answer detailed questions about socio-demographic conditions or about expectations. However, mainly due to privacy concerns and cognitive burden, there are higher rates of item non-response for detailed questions about household financial circumstances.

⁶ See the Methodological Notes of the Banca d'Italia (1991 - 2006). The panel response rates refer to the part of the sample that was selected to be re-interviewed.

⁷ For further details on the various incentives handed out to the participants in each wave see Schunk (2006).

In SAVE nonresponse rates for relatively complex items are limited and in line with rates documented in other surveys (Bover, 2004; Hoynes et al., 1998; Juster and Smith, 1997; Kalwij and van Soest, 2006). So for example for the amounts held in items such as stocks or bonds, nonresponse rates are between 11 and 17 percent of the households holding the items. The pattern is quite clear: the less defined the items are (such as “other assets” or “other debt”) the higher is item non-response.

While private old-age provision is reasonably well covered, households know very little about occupational pensions. Total net monthly household income has a relatively high non-response rate of almost 12%. This is mostly due to the necessary addition of items from various sources and across household members; non-response in specific categories, most importantly salary, wages and public pension income, is much lower.

Since deleting all observations with missing items is not a desirable strategy, SAVE provides estimates of the missing values using a variant of the *iterative multiple imputation* procedure developed by Rubin (1987) and Little and Rubin (2000) (for further details, see Schunk, 2008). Similar procedures have recently been applied also to other large-scale socio-economic surveys such as the U.S. American SCF, the Spanish EFF, and the Survey of Health, Ageing and Retirement in Europe (SHARE).

To put it simply, this procedure consists of two steps. In a first step, the conditional distribution of the missing variables is estimated using regression methods on a sample with complete data. It is important to condition on as many variables as computationally possible, to preserve the multivariate correlation structure of the data. In a second step, a Markov-Chain Monte-Carlo method is used to replace the missing items in the full data set by multiple draws from the estimated conditional distribution. In our case, the final user has five complete datasets, with all missing values replaced by imputed values. The differences in the imputed values across those five versions reflect the uncertainty about the “true” missing value.

The procedure has been recently further improved as documented in Ziegelmeier (2009, 2011). In particular the growing panel structure of the SAVE dataset has been used to logically impute missing values that can be easily retrieved from answers given in past waves of the study. Where applicable, this procedure, which relies on the relatively mild assumption that the respondents consistently report the truth over the years, improves notably the quality of the data: in many cases, more than 50% of the missing values can be replaced with proper values.

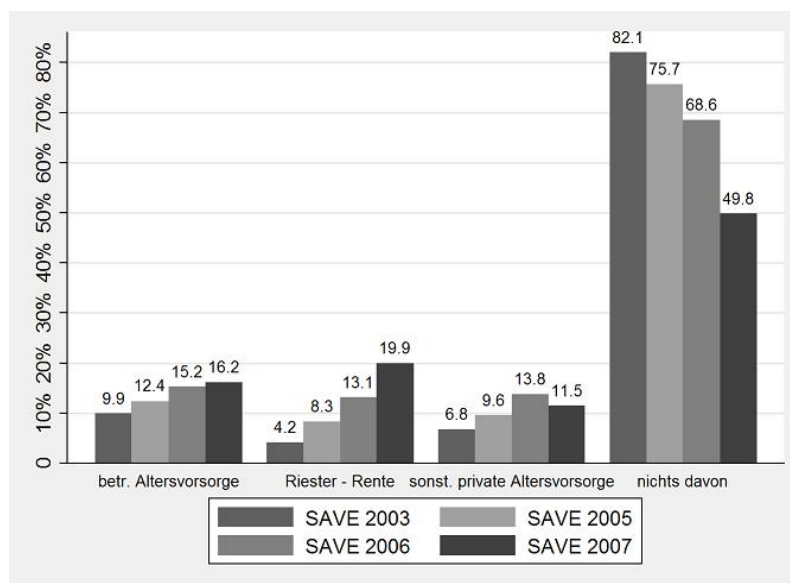
6. Selected results on old-age provision

Börsch-Supan et al. (2009) provide besides a detailed description of the methods also an extensive overview of the insights that can be gained thanks to the SAVE-study. In the following we limit us to a single example of particular relevance for the private old-age provision.

Figure 2 plots the percentages of households owning assets specifically designed for old-age provision. From 2003 to 2007, the relative frequency of households owning such an asset increased for all the asset types. The fraction holding company pension plans increased from 9.9% in the sample 2003 to 16% in the sample 2007; the fraction of households with a “Riester-Rente” almost quintupled, moving from 4.2% (SAVE 2003) to 19.9% (SAVE 2007); the fraction of households with other kinds of financial assets designed for old-age provision increased from the 7% in the survey 2003, to the 12% in the survey 2007.

An impressive majority of respondents (82,1%) reported in 2003 not to have retirement assets. The picture, however, notably changed since then: in the sample 2007 only 49,8% of the households still had no old-age provision. The fraction is even lower if the analysis is restricted to households still in the labor force: only 39.8% of the respondents report to have no private (that is neither individuals nor occupational plans) old-age provision. This evidence suggests an increasing awareness of the need to compensate the planned pension reductions in the pay-as-you-go pension system, with own-provided savings.

Figure 2: Shares of Households Holding a Specific Retirement Savings Asset



In general, SAVE shows that the Germans save regularly and in a planned fashion: more than one third of the respondents report to save regularly every month and almost 30% have specific saving targets in mind. German households are still conservative in their assets choice, owning mainly savings accounts and building savings contracts. Young families and richer families, however, appear more willing to invest in a broader range of financial instruments.

7. Future developments of the SAVE-project

Thanks to the substantial improvement in the availability and quality of available data, much has been learnt in the last years on the behavioral aspects of handling risk, uncertainty, and long-term planning. Such knowledge has proved very useful in answering general questions on individuals' reactions to the reforms and on their possible future consequences.

The recent economic and financial crisis, however, questioned the very core of the reforms. It is hotly debated whether, in times of economic turbulence and high uncertainty, it is wise to put more risk on individual shoulders. Where and how large are the gaps in public, employer-provided and own provisions? Will we face the return of old-age poverty, amplified by interrupted employment histories?

While data availability and quality has vastly improved, we still face crucial gaps. We do not have a comprehensive picture of old-age provision. One aspect of this is our little knowledge about the second pillar of occupational pensions. This leaves important questions unanswered, e.g., which households are covered by occupational pension plans, and whether individual and occupational pension plans crowd out each other or are complementary tools. Another crucial gap that is particularly damaging relates to analyses on the household level. Administrative records, e.g., are targeted at individuals. Hence, we know that many women and self-employed men have very small public pension entitlements. We do not know, however, whether their spouses are well covered, e.g. by civil servant pensions. We lack a comprehensive household-based view. A third area of missing knowledge is about the self-employed. Here, we even lack information on the individual level.

The existing SAVE study represents a useful starting point to create an innovative three-way linked employer-employee-record database targeted to the analysis of old-age provision and covering all three pillars of old-age provision at the household level to provide answers to the above questions. In an ambitious project in cooperation with the Institute for Employment Research (IAB) we plan to link the SAVE household survey with (a) administrative records of the Institute for Employment Research (IAB) and the Federal

Employment Agency (BA) and (b) occupational pension information provided by an add-on to the IAB Establishment Panel. Furthermore, we plan to survey individuals not subject to social insurance contributions separately.

The result will be a unique and very powerful data set, available to the entire research community, creating a research infrastructure able to achieve the substantive aim of better understanding long-term risks and households' provisions to cope with them.

8. References

- Banca d'Italia (1991) Supplementi al Bollettino statistico: indagini campionarie. I bilanci delle famiglie nell'anno 1989, Anno I, No. 26.
- Banca d'Italia (1993) Supplementi al Bollettino statistico: indagini campionarie. I bilanci delle famiglie nell'anno 1991, Anno III, No. 44.
- Banca d'Italia (1995) Supplementi al Bollettino statistico: indagini campionarie. I bilanci delle famiglie nell'anno 1993, Anno V, No. 9.
- Banca d'Italia (1997) Supplementi al Bollettino statistico: indagini campionarie. I bilanci delle famiglie nell'anno 1995, Anno VII, No. 14.
- Banca d'Italia (2000) Supplements to the Statistical Bulletin. Methodological notes and statistical information. Italian Households Budgets in 1998. Year X, No. 22.
- Banca d'Italia (2002) Supplements to the Statistical Bulletin. Methodological notes and statistical information. Italian Households Budgets in 2000. Year XII, No. 6.
- Banca d'Italia (2004) Supplements to the Statistical Bulletin. Methodological notes and statistical information. Italian Households Budgets in 2002. Year IV, No. 12.
- Banca d'Italia (2006) Supplements to the Statistical Bulletin. Sample Surveys. Italian Households Budgets in 2004. Year XVI, No. 7.
- Bover, O. (2004) The Spanish Survey of Household Finances (EFF): Description and Methods of the 2002 Wave, Documentos Ocasionales N.º 0409, Banco de España, Madrid.
- Heien, T., Kortmann, K. (2003) Spar- und Finanzanlageverhalten privater Haushalte (SAVE II). Methodenbericht. Infratest Sozialforschung, München.
- Heien, T., Kortmann, K. (2005) Spar- und Finanzanlageverhalten privater Haushalte (SAVE III). Methodenbericht. Infratest Sozialforschung, München.
- Heien, T., Kortmann, K. (2006) Spar- und Finanzanlageverhalten privater Haushalte . Methodenbericht. Infratest Sozialforschung, München.
- Heien, T., Kortmann, K. (2007) Spar- und Finanzanlageverhalten privater Haushalte 2007. Methodenbericht. Infratest Sozialforschung, München.
- Heien, T., Kortmann, K. (2008) Spar- und Finanzanlageverhalten privater Haushalte 2008. Methodenbericht. Infratest Sozialforschung, München.
- Heien, T., Kortmann, K. (2009) Spar- und Finanzanlageverhalten privater Haushalte 2009. Methodenbericht. Infratest Sozialforschung, München.
- Hoynes, H., Hurd, M., Chand, H. (1998), "Household Wealth of the Elderly under Alternative Imputation Procedures" in Wise, D. (ed.), *Inquiries of Economics of Aging*, The University of Chicago Press, Chicago, pp. 229-257.
- Juster, F.T., Smith, J. P. (1997) Improving the quality of economic data: Lessons from the HRS and AHEAD. *Journal of the American Statistical Association*, 92(440), 1268 – 1278.

- Kalwij, A., van Soest, A. (2006) Item Non-Response and Alternative Imputation Procedures In Boersch-Supan, A., Juerges, H. (eds) The Survey of Health, Ageing and Retirement in Europe: Methodology, MEA Mannheim.
- Kennickell, A. and M. McManus (1993) "Sampling for Household Financial Characteristics Using Frame Information on Past Income", paper presented at the 1993 Joint Statistical Meeting, Atlanta, GA.
- Little, R.J.A., Rubin D. B.(2002), *Statistical analysis with missing data*. Wiley, New York
- Rubin, D.B. (1987) Multiple Imputation for Nonresponse in Surveys. Wiley, New York.
- Schunk, D. (2006) The German SAVE Survey: Documentation and Methodology. MEA Discussion Paper 109 – 2006, Universität Mannheim.
- Schunk, D. (2008) A Markov chain Monte Carlo algorithm for multiple imputation in large surveys. *Advances in Statistical Analysis*, 92(1), 101 - 114.
- Ziegelmeyer, M. (2009) Documentation of the logical imputation using the panel structure of the 2003-2008 German SAVE Survey. MEA Discussion Paper 173 – 2009, Universität Mannheim.
- Ziegelmeyer, M. (2011), Illuminate the unknown: Evaluation of imputation procedures based on the SAVE Survey. MEA Discussion Paper 235-2011. Universität Mannheim.