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Working Paper

Maintenance of and innovation in long-term panel studies: the case of the German Socio-Economic Panel (GSOEP)

DIW Discussion Papers, No. 276

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Wagner, Gert G.; Schupp, Jürgen (2002): Maintenance of and innovation in long-term panel studies: the case of the German Socio-Economic Panel (GSOEP), DIW Discussion Papers, No. 276, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at: https://hdl.handle.net/10419/18260

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Discussion Papers

2/6

Jürgen Schupp and Gert G. Wagner

Maintenance of and Innovation in Long-term Panel Studies: The Case of the German Socio-Economic Panel (GSOEP)

Berlin, February 2002



German Institute for Economic Research

Opinions expressed in this paper are those of the author and do not necessarily reflect views of the Institute.

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www.diw.de

ISSN 1619-4535

Maintenance of and Innovation in Long-term Panel Studies: The Case of the German Socio-Economic Panel (GSOEP)

By Jürgen Schupp and Gert G. Wagner

Abstract

The availability of panel data on the basis of micro data has become an indispensable component of the infrastructure of empirically oriented social scientists and economists. This is also a consequence of the fact that, for a panel survey, the quality of both content and methodological analyses increases with each new wave. Especially the number of events which can be analyzed increases (e.g., social and regional mobility, life-course transitions like changing employment, occupational careers, family events and even death). In the USA, the "Panel Study of Income Dynamics (PSID)" has been running since 1968. In principle it was the prototype for the German Socio-Economic Panel Study (SOEP), which was started in 1984. However, the SOEP has its own features, e.g. the surveying of all adult household members, which made the SOEP itself a role model for all of the other panel studies which followed over the course of time. Survey data comparable to the SOEP which are easily assessable for researchers exist, for example, in Great Britain, the Netherlands, Russia, Hungary, Switzerland, and since 2001 in Australia.

Key Words: Panel analysis, survey research, longitudinal studies

1 Goals and Purpose of the SOEP

Established in the 1980s, the German Socio-Economic Panel Study (SOEP) is one of the main tools for social science and economic research in Germany. The SOEP facilitates pure academic research in the areas of micro-analytical social and economic

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The SOEP was originally a project of the Special Research Unit "Sfb3: Micro-analytical Foundations of Social Policy," which was financed by the German Science Foundation (DFG) at the universities in Frankfurt, Mannheim and Berlin, including the *DIW Berlin* (Hujer and Wagner 1985, Hauser et al. 1994). When the activities of the Special Research Unit came to their scheduled conclusion in 1990, the entire responsibility for the SOEP project was transferred to the *DIW Berlin*, which is an independent, non-partisan, and non-profit research institute. Since 1990 the SOEP has been supported at the *DIW Berlin* by major funding from the DFG. The DFG was granted the technical, organizational and financial control of the project by a resolution of the Federal-State Commission for Education Planning and Research Support (BLK).

research as well as micro econometrics. Equally, the SOEP is an important source for social monitoring and policy analysis.

The SOEP data are made available in user-friendly form ("scientific use file") to all independent researchers in the Federal Republic of Germany upon request and, in addition, worldwide to all independent research institutions.² Analysis of the data is supported by an extensive Internet and online service. Today the SOEP is also widely used by international organizations like the IMF, the ILO and the OECD.

Data are distributed not by a data archive, but by the SOEP group itself, because only this group can provide a sufficient level of assistance and effective support for the evaluation of the data. Because SOEP data operation is publicly financed, the data are released to users at "marginal" cost (CD-ROM and printed materials) plus delivery (currently DM 50 or €25).

To communicate information about the data quickly, the SOEP distributes information *about* the data.³ The SOEP homepage, on the web since 1994, is maintained by the group itself, at http://www.diw.de/gsoep and includes the quarterly SOEP NEWSLETTER. Moreover, special Internet-based information services on the *DIW Berlin* server are made available for specific inquiries.⁴

2 Concept of the Survey

In principle, the universe of the SOEP sample includes the entire resident population of Germany. As the SOEP started before reunification, the first sub-sample of the SOEP in 1984 was conducted only in West Germany. Unfortunately, it was not possible to include institutionalized households in the first wave of the survey in a representative

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Variables sensitive to data-protection issues, such as highly localized geographic codes, are available at the *DIW Berlin* to all interested researchers in the framework of a scholar-in-residence program (which is co-funded by the SOEP project).

The importance of the Internet for the process of SOEP data release is growing constantly. For reasons of data protection, however, all SOEP data are released *only on encrypted*, *password-protected CD-ROMs*.

These include *SOEPinfo* (an interactive information system on the structure and content of the SOEP and for assistance in automatically generating retrieval command files in SAS, SPSS, Stata and TDA), *SOEPlit* (a literature database with bibliographical information on all publications based at the SOEP), and *Listserver* (a list server soep-l@diw.de as a discussion forum for the exchange of information relevant to the SOEP). In addition to these resources, the SOEP group offers a central e-mail address (hotline) for questions from data users (soepmail@diw.de). Questions are either answered directly or forwarded to the relevant specialized project staff member. In addition to the Internet, a telephone hotline is available to assist in resolving user problems.

manner.⁵ Nevertheless, by following up respondents, a panel takes into consideration those who left private households for institutionalized households; over the course of time, the institutionalized population has been included in the SOEP.

The main random sample "A" included around 4,500 households in 1984. In order to allow separate analyses of the five groups of labor migrants most strongly represented in the Federal Republic of Germany at that time, they were over-sampled in the study with a total of 1,400 households in a disproportional random sample approach. This random sample "B" was itself subdivided into 5 sub-groups.

In order to observe the massive societal and economic changes in East Germany, along with their respective impacts, the first wave of the East German sample was collected in June 1990, *before* the currency, economic, and social union in Germany occurred. This sample covered about 2,200 households.

Since the SOEP started in 1984, Central Europe, and especially Germany, have experienced large-scale immigration which cannot be covered by any ongoing longitudinal survey. In order to correct for this bias, it made sense to supplement the SOEP for immigrants explicitly. For this reason, sample "D" was collected in 1994/95 for about 500 households of immigrants who had arrived since 1984.

In 1998 a "supplementary random sample" was started as a test. This sample fulfilled a number of aims: (1) stabilization of the number of cases in the SOEP for cross-sectional and longitudinal data, (2) allowing for analysis of "panel effects" and (3) allowing for analysis of "representativeness."

It became evident that such a supplementary sample could be integrated in a user-friendly manner into the ongoing "old samples" (including the problems of weighting; see Spiess/Rendtel 2000). Thus the methodological basis was established for significantly increasing the sample such that a further supplementary sample could be started in the year 2000. The launch of this new sub-sample implemented a recommendation of the advisory board of SOEP from 1998 to enlarge *significantly* the sample size of SOEP in order to increase the value of the study for policy analysis by

Moreover, higher rates of attrition during the course of the SOEP were expected for this population due to re-migration.

This is the case for all other surveys in Germany as well.

Sample "A" thus also includes households headed by a foreigner not belonging to the nationalities covered by sample "B," albeit on a negligible scale (e.g., Dutch, Swiss).

allowing the changes for relatively small groups of the population to be analyzed on the basis of sufficient numbers of cases.

All the surveyed persons in the SOEP participate voluntarily and without direct monetary compensation. Because of this, the measures of "panel maintenance" to ensure the stability of the SOEP sample are very elaborate and differentiated. Each household receives a small gift from the interviewer and a brochure which presents interesting results and press coverage. After the interview has taken place, each respondent also receives a lottery ticket by snail mail. The mailing of the ticket reminds a respondent that he belongs to the "SOEP family." In addition it is a device to ensure that the interviewers do indeed carry out the interviews with the intended respondents, as a respondent who was not in fact interviewed would be surprised and suspicious. A permanent hotline was set up at the survey institute 10 and at the DIW Berlin as an instrument for reassuring respondents during the field period.

Every individual 16 years of age or older in the household is surveyed in all samples. For the first survey wave of the random samples "A" and "B," information was collected on 12,245 respondents. A total of 16,252 individuals lived in the 5,921 households randomly sampled and interviewed in 1984. Data on the 3,928 children living in these households who had yet to reach survey age were obtained by asking an older member of the household.

Sample "C," included 2,179 private households in its first wave in 1990, with 6,131 household members, 4,453 of whom were 16 years or older and answered the survey questions themselves. As of 1995 random sample "D" included 522 households with 1,078 surveyed individuals and 517 children. Random sample "E" began in 1998 with 1,067 households, in which 468 children were living and 1,932 individuals were surveyed directly. Sample "F" consists of 10,890 adult respondents and 2,993 children living in 6,058 households as of 2000.

All in all, 24,586 adult individuals participated in the SOEP survey in 2000, who lived in 13,258 households with 6,659 children under 16 years of age (cf. figure 1).

As far as the availability of individual events is concerned, for long-term panel studies the potential for information is cumulative. After 15 years, the SOEP could

For first results on this issue see Landua (1991). In the framework of the CHINTEX Project, systematic analysis is being performed on panel effects. For preliminary results see Neukirch (2001).

In the field the study is called "Leben in Deutschland" (Living in Germany).

identify about 1,400 deaths, 1,100 relocations abroad (predominantly re-migration of immigrants) and around 10,000 incidences of completed episodes of unemployment (see figure 2 for the development of employment periods in samples A and B).

3 Survey Methods and Instruments

As a rule, data for the SOEP are collected in face-to-face interviews using completely standardized survey instruments, with an interviewer conducting an oral interview or the respondents filling in the questionnaires themselves with final supervision by the interviewer. In households with "old friends" who have participated in the SOEP for a long time, interviews administered by phone without a visit by an interviewer are performed on a limited scale. In this cases respondents fill in the questionnaires by themselves with phone support from the fieldwork organization.

This mix of methods is necessary in Germany to ensure that respondents remain willing to participate over the long term. Since 1998, "Computer Assisted Personal Interview" (CAPI) methods have been introduced gradually to complement the conventional "paper and pencil" questioning technique. This survey method was introduced for the first time in the old SOEP sub-samples in 2000 with the consequence that the percentage of self-completed interviews could be reduced (see table 1). Information about the mode of the interview is stored together with the survey data and thus interview artifacts can be analyzed by every researcher using SOEP data.

In order to ensure the success of the long-term aim of the SOEP, a high value is placed on the quality of field work in terms of methodology and surveying techniques. The efforts put into designing the survey instruments and following up on the respondents ensure a high rate of longitudinal continuity, in contrast to ordinary cross-sectional studies.

Interviews are performed using three different versions of the questionnaire, each of which was designed to be flexible enough to suit the mix of methods specific to the SOEP and its peculiarities.

Household questionnaire: The "reference person" ("head of household") provides information about the household as a whole (e.g., housing situation, receipt of transfers,

The field work of the survey is done by Infratest Sozialforschung, Munich.

See Schräpler/Wagner (2001) for details.

information about household members needing long-term care and about children under 16 years. The duration of the interview is approximately 15 minutes.

Individual Questionnaire: Each person 16 or older¹² completes an individual personal questionnaire each year with a duration of approximately 35 to 40 minutes.¹³

Biography Questionnaires: Basic biographical information on the respondents is collected once in the first years when the person is interviewed, lasting approximately 15 minutes. Since 2000 the questionnaire is twofold: a standard biographical questionnaire for adults and a special youth questionnaire about childhood for 16/17-year-old respondents.

The methodological research which has attempted to identify any kinds of sustainable mode or technology effects¹⁴ or mode effects on attribution¹⁵ caused by CAPI use have yet to yield any significant results (see von Rosenbladt 2000, Schupp 1999).¹⁶

The implementation of the new CAPI technology in sample "E" started with CAPI versions of the individual and household questionnaire. A booklet with all lists and scales had to be added to the set of SOEP survey instruments. In 2000 CAPI was used in the new sub-sample "F" and, for experienced interviewers, it was also allowed to be used in samples A-D as an additional option in the already existing method mix. Finally in 2001, CAPI versions for all retrospective biography questionnaires had been developed.

A major improvement of random route samples which are conducted in Germany was implemented with sub-sample "F." Because the local voter registers (Wählerverzeichnisse) are the basis for drawing sample points, sample points with different shares of non-German citizens are not drawn by probabilities which reflect their weight for the population living within German territory (Wohnbevölkerung). Thus

For temporary dropouts (non-respondents in t-1 who where not able to give the interview but who did not refuse), a short questionnaire is administered to acquire basic labor market and demographic variables for the year that is missing.

That is to say, the year in which the person becomes 17.

For an overview on this kind of discussion see Couper/Nicholls (1998), de Leeuw (1999) and Fuchs (2000).

To date, tests on mode effects have shown no significant non-response pattern in the SOEP; see Pannenberg (2000).

In 1999 CAPI was – finally (Laurie/Moon 1997) - introduced in the BHPS. In contrast to the SOEP, the technology was changed for the sample as a whole. First results also show no mode effects (Laurie 2000).

all standard random route samples (according to ADM standard procedure¹⁷) underestimate the share of foreigners in Germany. In order to overcome this shortcoming, the field-work organization *Infratest* introduced an over-representation of foreigners in the random route of SOEP sub-sample F. The number of addresses which are collected by a random route was doubled, but within the "access addresses" only households with foreigners living in them¹⁸ were interviewed. By means of this procedure the share of foreigners in the sample accurately reflects the share in the universe. However, the structure of the foreigners is still biased, because sample points with a high share of foreigners still have a downward biased probability of being included in the sample. However, this bias can be corrected by re-weighting.

4 Recent Developments and New Directions

In all surveys, all over the world, the far ends of the tails of the income distribution are not covered sufficiently. At the lower end of the distribution, the homeless are not sampled at all, whereas at the top end, the number of cases is too small (even where the willingness to participate in a survey is the same as in all other income groups). In 2000/01 measures to overcome those problems within SOEP were examined.

The conclusion was that the sampling of homeless people would be not only expensive, but there are serious doubts if it would be possible at all.¹⁹ On the other hand, it turned out that the over-sampling of high-income households (with an income in the top 2.5 percentile) would be relatively easy to realize. Although it is not feasible to use addresses of an "access panel,"²⁰ it is possible to use addresses of participants in ongoing telephone surveys who respond to the standard demographic context variables including net household income. In 2002 an additional sub-sample of more than 500 new high-income households will be added to the SOEP family of sub-samples.

Identified as proxy by the name of the household. For details of the derivation of design weights see Spiess (2001).

For details see ADM/AG.MA (1999).

Thus we will wait for the results of pilot projects which are being conducted on behalf of the *Statistisches Landesamt NRW* and the Federal Ministry of Labor and Social Security (BMA), "People in extreme poverty." The latter project also intends to examine the feasibility of a representative survey on extreme poverty on a qualitative methodological level.

See Infratest (2000a) for details. For an overview about access panels as a new kind of sample, Hoppe (2000).

Identifying Deaths and Moving Abroad

Respondents who die or move abroad "create" events which are worthy of analysis.²¹ However, it is difficult to survey all events like these, because respondents are more likely to refuse a response just before death (or moving abroad). Thus it is necessary to gather this information by checking the "status" of former respondents. In Germany, this is possible by asking the local municipalities about the status of an inhabitant. Cumulated over time, the information concerning the status of more than 8,000 persons will be updated in 2002. These information will substantially increase the quality of analyses of differential mortality rates and other forms of non-response and will be distributed to all SOEP users in 2003.²²

New Coding Schemes for Industry and Occupation

Due to a lack of funding, up to now it was not possible to completely re-code the classification of occupation (according to the ISCO88 standard) and industry (according to the more detailed and meanwhile common NACE classification). Re-coding at this time could also take advantage of new methods which have been developed by *Infratest Sozialforschung* (in collaboration with the *Statistisches Bundesamt*). This new technology opens up the possibility of instantaneous coding during the interview for all CAPI interviews.

Matching with Register Data

Based on a pre-pretest in 2002, it is planned to match SOEP micro data with employment office register data by asking the respondents for their social security number. This new procedure offers a comparatively superior opportunity for modeling labor market procedures.²⁴ Matching the SOEP employment histories with the official employment statistics would cover about 80% of all employed respondents (excluding civil servants, the self-employed, the marginally employed and family workers). In this

For this kind of analysis, see Voges (1996).

As a further – but expensive – improvement it would be possible to attempt to re-interview "old" dropouts, who did not refuse, but dropped out because they were not able to participate for a while. This would provide an excellent opportunity to analyze panel effects.

The standard coding has been performed by ZUMA, Mannheim since 1984. For the new method see Infratest (1999).

For the holders of register data, e.g. the *Bundesversicherungsanstalt für Angestellte*, the household context of SOEP is of particular interest. In Germany register data provide only information on individuals (e.g. employees, retirees). For example, the Social Security Administration cannot match the data of couples; by means of the SOEP such a match would be possible.

official register, employers report all employment data about the firm's employees (including their exact wages).

The most crucial part is to obtain permission for data matching by means of a formal statement from the respondents, including a detailed description of all information collected in the integrated employment register.

The match with death certificates (*Totenscheine*) would constitute a special match with register data. There are no legal barriers against performing this match, but it would be very expensive because there is no central register of death certificates in Germany. It would be necessary to check the registers of every municipality where one of the SOEP respondents passed away. Possibilities for such a procedure will be sought in 2003.

Internet Surveying

In order to learn more about the possibilities of Internet surveying, the DIW Berlin is collaborating with the NSF Project (USA) "Survey 2001," administered at Clemson University (South Carolina). The study is directed by James C. Witte, a former staff member of the SOEP group at the DIW Berlin.

5 An Example of the Richness of SOEP Data

The SOEP Study is not only of interest because it supplies longitudinal data, however; beyond "hard" facts like employment and income, the SOEP provides data on "soft" facts as well, for example satisfaction with certain domains of life. This feature of the questionnaire allows not only sociological analyses, but also a link to psychological and economic analyses (for an example, cf. Andrew Clark et al. 2001).

Table 2 provides an example for such a interdisciplinary analysis. In Germany there is an ongoing debate as to whether overtime work should be restricted or "transformed" into "working-time accounts," meaning that an employee will be compensated not by money but by flexibility on his annual schedule of working hours. The SOEP allows analysts to determine whether such flexibility would increase employees' satisfaction with their workplace. To this end it can be analyzed whether various patterns of overtime work have different impacts on satisfaction. The table displays the results of a regression which controls for all of the common X variables (age, schooling, labor-market experience) (cf. Pannenberg and Wagner 2001). The left-hand variable is high "job satisfaction," analyzed by means of a binary logit model. The results are shown by

percentiles of income (rows). Comparing the different columns shows that in all income quintiles employees do not appreciate "compensated overtime" through working-time accounts. The change from paid to compensated overtime especially decreases employees' satisfaction.

6 Outlook

SOEP data are supplied together with other panel data for international comparative analyses. In the Cross-National Equivalent Data File (CNEF), SOEP data are provided along with data from the US Panel Study of Income Dynamics (PSID), the British Household Panel Study (BHPS) and the Canadian Survey of Labor and Income Dynamics (SLID).²⁵

SOEP data are also converted into the common format of the ECHP (European Community Household Panel), in cooperation with the *Statistisches Bundesamt* (Federal Statistics Office). This pan-European initiative is coordinated by Eurostat in Luxembourg.²⁶

A European conversion format for panel data has also been developed and enjoys academic direction. The "CHER" (Consortium of Household Panels for European Socio-Economic Research) format is coordinated and maintained at CEPS/INSTEAD, Luxembourg.²⁷, ²⁸

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See http://www.human.cornell.edu/pam/gsoep/equivfil.cfm .

See http://forum.europa.eu.int/Public/irc/dsis/echpanel/library.

Finally, the SOEP data are also a component of the purely cross-sectional Luxembourg Income Study (LIS). See http://www.lis.ceps.lu.

For a subset of countries but for more years (waves), the European Panel Analysis Group (EPAG) is putting together panel data in a format which is very similar to the ECHP format. EPAG is a consortium of ISER (Institute of Social and Economic Research at University of Essex), *DIW Berlin*, CLS (Centre for Labour Market and Social Research at University of Aarhus), ESRI (Economic and Social Research Institute, Dublin), TISSER (Tilburg Institute for Social Security Research) and WORC (Work and Organization Research Centre, both Tilburg, Netherlands) and DSSR (Department of Sociology and Social Research at University of Milano-Bicocca, Italy).

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Figure 1: Number of Personal Interviews SOEP 1984-2000

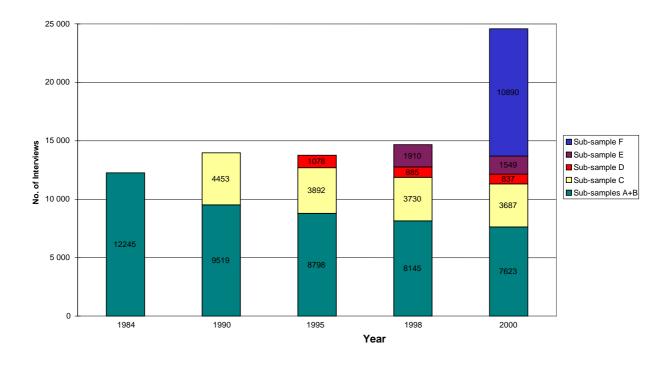


Figure 2



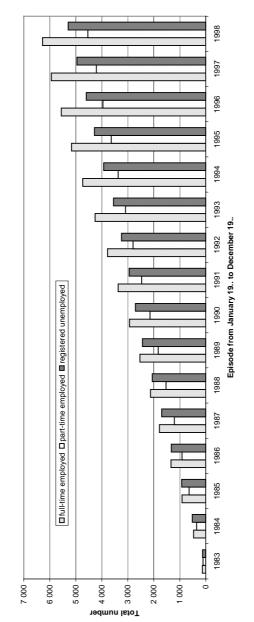


Table 1

	1984	1990	1991	1998	1999	2000
Sample A ("West German" Residents)						
With an interviewer attending	100.0	88.4	87.5	83.3	82.9	83.1
ol Willich.	0	0	0	;	1	1
face-to-face interview	60.2	49.2	48.9	41.3	40.7	33.7
self-completed interview	25.3	27.1	29.2	31.3	32.9	29.3
partly oral and partly written	14.4	12.0	9.3	10.7	9.0	8.2
proxy –interview	0.1	0.1	0.1	0.0	0.0	0.1
CAPI***					0.3	11.8
With telephone assistance						
questionnaire by mail/with	0.0	11.4	12.4	16.5	17.0	16.8
telephone contact						
total interview by telephone	0.0	0.2	0.1		0.1	0.1
Total	100.0	100.0	100.0	$\overline{}$	_	100.0
No. of respondents	(904)	(9076) (7036) (6974) (6184) (6045)	(6974)	(6184)	(6045)	(5852)
Sample C ("East German" Residents)						
with an interviewer attending		100*	99.1	84.6	83.5	82.8
of which:						
face-to-face interview			51.3	28.2	30.0	28.6
self-completed interview			23.8	38.2	41.0	38.3
partly oral and partly written			24.0	18.2	12.5	10.4
proxy interview			0.0	0.0	0.0	0.0
CAPI***					0.0	5.5
with telephone assistance						
questionnaire by mail/with telephone			6,0	15,4	16.5	17.2
contact			Ċ	(Ċ	Ċ
total Interview by telephone			0.0			0.0
total		(0.001	0.001		0.001
No. of respondents		(4453) (4202) (3730) (3709)	(4202)	(3730)		(3687)

^{*} no information about kind of response. ** no information since 1996. *** since 1998. Source: Socio-economic Panel Study 1984-2000.

Job Satisfaction and Patterns of Overtime Work in West Germany 1988-98 Table 2

90 th 0.21 0.21 0.21 0.22 0.18 0.16 0.17	0.21 0.20 0.17 0.15 0.16 (0.013) (0.023) (0.030) (0.034) (0.029) (0.027)	0.25 (0.014) 0.23 (0.012) 0.23 (0.017) 0.24 (0.024)	0.17 (0.023) 0.16 (0.021) 0.16 (0.023) 0.16 (0.027)	0.16 (0.026) 0.15 (0.024) 0.15 (0.026) (0.029)	0.17 (0.023) 0.16 (0.023) 0.17 (0.027) (0.034)	0.17 (0.026) 0.16 (0.024) 0.18 (0.026) (0.026) (0.030)	0.22 (0.016) 0.20 (0.015) 0.20 (0.017) 0.21 (0.023)	0.25 (0.014) 0.22 (0.012) (0.012) (0.013) 0.21	0th :5th :5th
(0.000) (0.0020) (0.0020)	0.21 0.21 0.22 0.18 0.16 0.17	(0.031)	(0.032)	(0.032)	(0.039)	(0.033)	(0.029)	(0.016)	
0.21 0.20 0.17 0.15	\\ \\ \\ \\ \\ \\ \\ \	0.23 (0.017)	0.16 (0.023)	0.15 (0.026)	0.17 (0.027)	0.18 (0.026)	0.20 (0.017)	0.21 (0.012)	$50^{ ext{th}}$
0.21 0.20 0.18 0.17 0.15 (0.012) (0.017) (0.026) (0.027) (0.026) 0.21 0.21 0.20 0.17 0.15	0.21 0.20 0.18 0.17 0.15 0.16 (0.012) (0.017) (0.026) (0.027) (0.026) (0.023)	0.23 (0.012)	0.16 (0.021)	0.15 (0.024)	0.16 (0.023)	0.16 (0.024)	0.20 (0.015)	0.22 (0.012)	25 th
0.22 0.20 0.16 0.16 0.15 (0.012) (0.015) (0.024) (0.023) (0.024) 0.21 0.20 0.18 0.17 0.15 (0.012) (0.017) (0.026) (0.026) (0.026) 0.21 0.21 0.20 0.17 (0.026)	0.22 0.20 0.16 0.16 0.15 0.16 (0.012) (0.015) (0.024) (0.023) (0.024) (0.021) 0.21 0.20 0.18 0.17 0.15 0.16 (0.012) (0.017) (0.026) (0.027) (0.026) (0.023)	0.25 (0.014)	0.17 (0.023)	0.16 (0.026)	0.17 (0.023)	0.17	0.22 (0.016)	0.25 (0.014)	$10^{ m th}$
0.25 0.22 0.17 0.17 0.16 (0.014) (0.016) (0.026) (0.023) (0.026) 0.22 0.20 0.16 0.16 0.15 (0.012) (0.015) (0.024) (0.023) (0.024) 0.21 0.20 0.18 0.17 0.15 (0.012) (0.017) (0.026) (0.027) (0.026) 0.21 0.21 0.20 0.17 0.15	0.25 0.22 0.17 0.16 0.17 (0.014) (0.016) (0.026) (0.023) (0.026) (0.023) 0.22 0.20 0.16 0.15 0.16 (0.012) (0.015) (0.024) (0.023) (0.024) (0.021) 0.21 0.20 0.18 0.17 0.15 0.16 (0.012) (0.017) (0.026) (0.027) (0.026) (0.023)	Ratio of paid overtime to no overtime	Ratio of paid overtime to compensated overtime	Ratio of paid overtime to unpaid overtime	Both years: compensated overtime	Both years: unpaid overtime	Both years: paid overtime	Both years: no overtime	

Note: Each table entry is the predicted fraction of 'satisfied (>8)' workers in t; rows are the monthly labor earnings of the starting percentile in (t-1). The prediction was calculated by means of a binary logit model (see text).

Numbers in parentheses are robust standard errors of predictions.

Source: GSOEP 1988-1998; Pannenberg and Wagner (2001).