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The sensitivity of distributional measures to the reference period of income*

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Abstract:
When individual or household incomes are collected for administrative or scientific surveys, the reference period of income is sometimes a month, sometimes a quarter, and sometimes a year. This reference period of income likely affects the shape of the distribution and derived measures of inequality, poverty, and mobility. Using employment histories of German residents, the present study systematically explores the sensitivity of distributional measures to the length of the reference period of income. Estimates from annual, quarterly and monthly distributions are provided for one and a half decades, starting from year 1991.

Keywords: inequality; poverty; mobility; reference period of income; monthly, quarterly, and annual distributions; earnings; Germany

JEL classification: D1, D31, I32

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1 Introduction

In the last decade, issues of distributive justice, fairness and equity have gained interest among social scientists, policy makers, and the public. Nowadays, various micro databases are available, offering detailed information on distributional patterns and trends, allowing researchers to disentangle the underlying distributional forces (see, for example, Fiorio, 2011, and the references cited therein). Undeniably, several (arbitrary) normative decisions are underlying any distributional analysis, limiting the comparability of estimates. These decisions relate to the living-standard indicator (e.g., income, consumption, expenditures, wealth), the unit of analysis (e.g., the individual, the household, or the tax unit), and the adjustment of monetary measures for differences in needs (by means of equivalence scales).

A vast literature explores the sensitivity of the obtained results to aforementioned normative choices. Little, however, is known about the sensitivity of distributional measures to the length of the period over which income is surveyed: the reference period of income (RPI). In some databases, the reference period is a month, in others a quarter or a year. For example, several British micro databases (see Böheim and Jenkins, 2006) and the German Socioeconomic Panel[1] provide information on *current* income (income in the month of the survey interview), while income surveys in many other countries document *annual* household income, aggregate income in a calendar year (e.g., the US Current Population Survey, the Panel Study of Income Dynamics, and the Canadian Survey of Labour and Income Dynamics). Incomes in the German Income and Expenditure Surveys (IES) 1978-1993 again build on an annual RPI, as opposed to a quarterly RPI since then.

As pointed out in Fields and Ok (1999, p. 455) or Albarran et al. (2009), short-term income fluctuations may cause economic insecurity and negatively affect peoples' well-being. Arguably, an extension of the reference period of income – say from a month to a year – evens out sub-annual income fluctuations, thus affecting the shape of the income distribution and derived measures of inequality, poverty, and mobility. This in turn restricts the comparability of distributional measures from databases with different RPI. For example, a cross-country distributional comparison with the British BHPS and the German SOEP as provided in Myck (2010) should be 'unbiased' because the RPI is the same for both datasets, while changing reference periods over time question the inter-temporal comparability of distributional indices from the German IES (see Bönke et al., 2010).

[1] Precisely, the question is asked "What is the monthly household income of all household members today?", and the response category is Euro per month. See GSOEP data documentations for details (available online).

Shorrocks (1978) under quite general conditions has shown that inequality and the RPI are negatively related.[2] For other distributional aspects, i.e. poverty or mobility, theoretical predictions are more ambiguous (see Böheim and Jenkins, 2006).[3] In sum, the quantitative impact of the RPI on distributional measures, sometimes including the sign, remains an empirical question.

The data requirement for a systematic empirical assessment of the impact of the RPI on distributional measures is high. Ideally, the income information should be derived for different reference periods under ceteris paribus conditions, e.g. for the same sample, in the same period and also using the same income definition (e.g., gross vs. net, household vs. individual income).

Empirical data rarely meet these requests, explaining the scarcity of empirical evidence. Only a few studies explore the RPI-distribution nexus, namely Shorrocks (1981) and Ruggles (1990) for the United States, Morris and Preston (1986), Nolan (1987) and Böheim and Jenkins (2000, 2006) for the United Kingdom, Gibson et al. (2001) for China, Cantó et al (2006) for Spain, Finkel et al. (2006) for Israel, and Detlefsen (2012) for Germany.[4] Several of these studies (see Section 2 for details), however, build on databases that are not ideally suited to explore the impact of the RPI. Maybe for this reason Finkel et al. (2006, p. 177) conclude that "additional research on different data sets is needed in order to get a clearer picture."

The present paper seeks to contribute in this direction by investigating the relationship between the reference period of income and distributional measures using German social security data. Particularly, the Insurance Account Sample (IAS, the so-called "Versicherungskontenstichprobe") of the year 2006 serves as the database. IAS documents individual earnings biographies of pension insurants living in Germany. Particularly, IAS provides – for any month of the employment biography – the level of monthly earnings subject to social security. Most importantly, there is no smoothing of monthly earnings over particular periods like employment spells, or of one-time payments like vacation or Christmas bonuses over a year. Accordingly, IAS provides precise information on the monthly earnings distributions, and these again can be aggregated to construct synthetic quarterly and annual earnings distributions. Accordingly, the IAS is a suitable candidate to perform a

[2] Wodon and Yitzhaki (2003) provide the formal relationship between the reference period of income and the Gini index.

[3] Ravallion (1988) and Chesher and Schluter (2002), however, have shown that the poverty rate from short-term income is at least as large as from long-term income if the poverty line is set below the modal income.

[4] A vast literature deals with lifetime, long-term and annual inequality. Yet, differences between annual and sub-annual income distributions are not an issue therein.

comprehensive analysis of the RPI-distribution nexus under the aforementioned desirable ceteris-paribus conditions.

Our results complement the previous literature in several dimensions. First, the present work provides a systematic analysis of the impact of the RPI on inequality, poverty, and mobility, while previous works usually only focused on one of the three dimensions. Second, the standard static analysis for a particular year is complemented with a long-run analysis to assess how the RPI impacts longitudinal distributional patterns and trends (starting with German re-unification). Third, we not only provide point estimates but also test for statistical significance of our findings using the bootstrap.

Our first finding is that, in general, inter-temporal trends of the derived inequality, poverty, and mobility measures for the observation phase (1991 to 2006) are quite robust to RPI variations. However, statistical assessments regarding the significance of inter-temporal changes in the distribution can respond sensitively to RPI variations. Second, inequality and mobility indices are negatively associated with the length of the RPI. While theory predicts such an inverse relationship for inequality measures (see Shorrocks, 1981), the relationship for mobility indices is ex ante undetermined. The head count ratio, i.e. the incidence of poverty, on the contrary, exhibits no systematic relationship with the RPI. Third, the RPI is not innocuous for regional comparisons of distributional measures. For example, when the RPI is a year, the Gini index for the 2006 earnings distribution is significantly lower in the New compared with the Old states, but this divide disappears when the RPI is shortened to a month.

The paper is organized as follows. Section 2 reviews the findings of previous empirical literature. Section 3 introduces the database and provides the methodological procedure how we assess the impact of the RPI on the distribution. We then turn to the empirical analysis in Section 4. Section 5 concludes.

2 Literature review

The data requirement for a systematic empirical analysis of the relationship between the length of the reference period of income and the distribution is high, explaining the scarcity of empirical evidence on this matter. The subsequent review of previous empirical studies steps on Böheim and Jenkins (2000), and complements it with more recent studies. Table 1 summarizes the findings on the RPI-distribution nexus in the literatures reviewed below.

Morris and Preston (1986) study inequality and poverty using three cross-sections of the UK *Family Expenditure Survey* (1968, 1977, 1983) using three different income concepts: "normal net income" (NNI); current net income (CNI; the same as NNI except that labor income is the last amount received rather than the usual amount); and annualized net income (ANI; approximate average income over the last 52 weeks (ibid., 288)). While no exact definitions of income concepts have been provided, NNI and ANI seem to have characteristics of an annual and CNI of a monthly income concept - at least as labor income is concerned. This interpretation is supported by the authors' estimates. Consistent with the theoretical argument of Shorrocks (1978), Morris and Preston (1986) find less inequality in the NNI compared with the CNI distribution. For ANI, however, results are ambiguous. In years 1968 and 1977, the ANI distribution indicates less inequality than CNI, but the relationship (surprisingly) reverts for year 1983. The authors also provide poverty rates across income concepts, with CNI-based poverty rates being higher than NNI-based poverty rates. Comparing CNI with ANI, poverty rates in 1968 and 1977 again are higher for CNI, whereas the opposite holds for 1983.

Another study is Nolan (1987), who uses the 1977 UK Family Expenditure Survey as the database. The author compares distributions of an annual gross household income (AGI) and a current monthly gross household income (CGI) concept. The annual income measure is derived using the same retrospective data on employment and receipt of major social security benefits as in Morris and Preston (1986), but more details on the construction of the incomes is provided. Differences in measured inequality from the two distributions are small: the coefficient of variation derived from the distribution of CGI is 0.729 compared with 0.700 for the AGI distribution.

In a short paper, Gibson et al. (2001) compare selected inequality measures for China in year 1992 using annual income and one (staggered) month of income observations. Regardless of the measure used, they find "large and systematic differences when using monthly rather than annual incomes" (p. 331), with inequality in monthly incomes being 1.17 to 1.69 times higher than in annual incomes. With 247 households, the sample used by Gibson et al. (2001), however, is rather small. Accordingly, it is not ruled that the ratio inherits a non-negligible error.[5]

Cantó et al. (2006) studies the role of the RPI for indices of poverty, poverty transitions, and inequality using the Spanish *Encuesta Continua de Presupuestos Familiares* (ECPF) as

[5] Unfortunately, Gibson et al. (2001) neither provide standard errors nor confidence intervals.

database. The ECPF is a rotating panel surveying about 3,200 Spanish households four times a year, providing quarterly household incomes over a period of up to eight quarters. Similar to Ruggles (1990), these quarterly incomes are aggregated to annual incomes. Cantó et al. (2006) find significantly higher inequality and poverty estimates when using a quarterly rather than an annual reference period. According to the authors' estimates, head count ratios and Gini indices from the quarterly distributions, for example, are 7.5 respectively 5.3 percent higher than the indices from the annual distribution (see Cantó et al., 2006, p. 213). Also the poverty transition probabilities are higher when quarterly incomes are considered (ibid., p. 215).

Maybe the most comprehensive study on the RPI-distribution nexus is Böheim and Jenkins (2000, 2006). Using data from the British Household Panel Survey (BHPS) the authors compare distributional indices from current and annual gross and net income distributions encompassing the period from 1991 to 1997. Only a small excerpt of their empirical estimates is provided in Table 1. Summarizing their empirical evidence, the authors conclude that "current and annual income measures provide very similar pictures of the income distribution" (Böheim and Jenkins, 2006, p. 754). In their literature review, Cantó et al. (2006), however, argue that this similarity results from data restrictions. Particlularly, Cantó et al. (2006, p. 210) argue that the current income of Böheim and Jenkins (2000, 2006) is a "smoothed income concept that becomes … close to … annual income." We are not in the position to validate or falsify their statement.

Finkel et al. (2006) compare Gini indices from monthly and annual equivalent net income distributions derived from the 1979/80 Household Expenditure Survey in Israel. The index from the monthly distributions (averaged and weighted – see Table 1 for details) is about 1.077 times higher than the index from the annual distribution. The Gini index for the monthly income distribution is about two percent higher than the index for quarterly income.

Finally, Detlefsen (2012) provides inequality patterns of individual earnings for some selected cohorts of West German men. She finds that the reduction of the accounting period from a year to a month increases measured earnings inequality in year 2004 – expressed by means of the Gini or the Theil coefficient – by 1.923 respectively 10.479 percent. However, the database underlying her analysis, provided by the research data center of the Germany's Institute for Employment Research (IAB), is not ideally suited for assessing the impact of RPI variations on the distribution. The provided monthly earnings are smoothed over employment

spells (see the data description in Detlefsen (2012) for details), so that sub-annual earnings fluctuations are artificially reduced.[6]

Table 1 about here

In sum, the evidence on how the RPI impacts the distribution and distributional measures is limited and also rather mixed. While some empirical studies suggest that distributional measures are rather sensitive to RPI variations, others indicate that the effect is negligible or small. Most plausibly, the heterogeneity of the findings has several causes, including, amongst others, the use of different income concepts (gross, net, disposable, equivalent, etc.), different observation units (household vs. individuals), technical details regarding the construction of the income aggregates, the choice of the distributional measure, and country-specific peculiarities. Furthermore, except for Böheim and Jenkins (2000) and Detlefsen (2012), no study systematically explores how distributional *trends*, i.e. inter-temporal changes in levels of inequality, mobility or poverty over time, are affected by the length of the RPI. Basically unanswered is the question how RPI reductions from a year to a quarter or a month impact mobility indices.

3 Methodological considerations

3.1 Data and data preparation

The subsequent empirical analysis builds on administrative data provided by the Data Center of the German Pension Insurance (Forschungsdatenzentrum der Rentenversicherung, DC-GPI in the following). In Germany, nearly all employees are mandatory insured in the federal pension insurance. As the pension entitlement of an insurant in Germany is closely related to her earnings history, the federal insurance, for all its insurants, records information on the earnings for each and every month of the phase of gainful employment. The DC-GPI provides excerpts of the recorded data in form of several scientific use files. For our purposes, the Insurance Account Sample (Versicherungskontenstichprobe) is a suited candidate. The IAS is a stratified random sample of employees living in Germany, having at least one entry in their individual social security record, and being between 15 and 67 years old at the end of year 2006 (a detailed online documentation of IAS provided by DC-GPI is available at www.fdz-rv.de).

[6] For further information on the IAB panel data see also Fitzenberger and Wikke (2010).

Altogether, IAS 2006 stores representative employment biographical information of 60,304 individuals, and is split in two parts. The first part contains time-invariant information, e.g., the gender, and birth year of the insurants. The second part provides information on each and every month of the employment biographies of the 60,304 insurants. Surveyed items include: contributions to the pension system from own employment, other credited contributions,[7] employment status, child-raising activity, etc. Up to 624 elements of monthly information (equivalent to 52 insurance years) are stored in a $60,304 \times 624$ matrix for every reported item.

Credited monthly pension contributions are provided in the form of so-called remuneration points. Remuneration points from own employment are directly linked with earnings subject to compulsory insurance. If an employee's earnings in a particular month (year) coincide with 1/12th (1/1) of average annual earnings subject to compulsory contributions in Germany, then the number of credited remuneration points in the particular month (year) is 0.083 (1.000). In Germany, remuneration points are credited up to year-specific assessment ceilings,[8] affecting about ten percent of the recorded data.

Our analysis builds on the biographical variable MEGPT. For every month of the observation period, it gives the original remuneration points from employment acquired within the same month. Hereby, MEGPT focuses on remuneration points from own contributions, and not comprises remuneration points credited during child care periods, credited for periods of reduced contributions, etc. In months of unemployment, MEGPT must be corrected for remuneration points credited for unemployment. Moreover, remuneration points credited in the New Federal States are artificially inflated to alleviate the gap in average earnings between the New and Old Federal States (see Attachment 10 of Germany's pension law for details). For example, in the first (second) half of year 1990 earnings in the New States have been artificially inflated by a factor 3.0707 (2.3473). Since the mid nineties, the factor varies around 1.2. Via the biographical variable RCEG it is feasible to disentangle, month by month, remuneration points credited for earnings made in the Old and New States, and to undo the inflation of earnings in the New states.

Multiplying the adjusted month-specific values of MEGPT for each insurant with gross average earnings in the year gives a precise picture of the distribution of monthly gross earnings (up to the assessment ceiling). Adding up the monthly earnings over a quarter or year, the associated quarterly and annual earnings distributions can be derived. With the

[7] In the German system, pension entitlements can also be gained during so-called non-contribution periods. Such periods include, amongst others, child care, sickness, rehabilitation, care of dependents, or military service. See Schröder (2012) for details.

[8] See Appendix B.1 for details.

monthly, quarterly and annual earnings distribution, we can now study the impact of the RPI on distributional measures can be quantified under the aforementioned ceteris-paribus conditions.

Of course, the IAS is not free of limitations. As outlined above, assessment ceilings cause that earnings are top-coded, and this should lead to downward-biased inequality and mobility indices. Moreover, only selected insurance-relevant information on the sample is collected and stored in the IAS database. Particularly, IAS provides no information on the household/family composition; income sources other than earnings from dependent employment; and incomes of other household/family members. So, IAS contains sufficient information for constructing individual earnings distributions, but not for deriving distributions of household (equivalent) incomes.

3.2 Sample selection

VSKT provides biographical information both for the period before and after German reunification. However, earnings of insurants in the former GDR are incomparable with earnings in the FRG due to the lack of a meaningful exchange rate. For this reason, we restrict our attention to the period after Reunification (years 1991 and on). Moreover, to immunize results from other blurring factors, we focus on a rather homogeneous sample, i.e. prime-age males and females (age cohort 30 to 50) whose social status in all twelve months of a particular year is one of the following: employed, marginally employed, or unemployed. Accordingly, persons far away from the labor market (e.g., due to child care or serious illness), as well persons who took-up a non-dependent employment work that is not subject to compulsory insurance (i.e., self-employment or civil servants) have been discarded from the database. Finally, insurants of the minors pension have been discarded as they are subject to particular social security regulations.

3.3 Distributional measures

The empirical analysis builds on static one- and dynamic two-period distributional measures. Particularly, in the present paper the Gini index, the Theil index, and the coefficient of variation serve as inequality measures. The head count ratio (the fraction of the population falling below the poverty line and thus classified as poor), and poverty-exit rates (the fraction of the poor climbing out of poverty between two consecutive periods) serve as poverty measures. Mobility is measured by means of the transition-matrix based Prais index (mean

exit probabilities from earnings classes) and the Atkinson mobility index (population share that does not remain close to the diagonal of the transition matrix). For computing the mobility indices, earnings distributions have been subdivided into quintiles. Definitions of all the distributional indices can be found in Appendix A.

To assess how the reference period of earnings impacts the static distributional measures, a three-stage procedure is implemented. First, from the earnings distribution of a particular year, E_a, of each quarter, $E_{a,q}$ with $q = 1,2,3,4$, and of each month, $E_{a,m}$ with $m = 1,...,12$, one of the aforementioned one-period distributional indices, $I(E_x)$, is derived with "x" denoting the particular period. So, for any year of the observation period and for any distributional index, 17 values are computed: the index for the annual distribution, four indices from the quarterly distributions, and twelve from the monthly distributions. In a second step, the indices from the four (twelve) quarterly (monthly) distributions are averaged over the year. In case of the inequality indices, a weighted mean is derived following the strategy recommended in Shorrocks (1978). Particularly, the quarter-specific (month-specific) shares of total earnings in the same year serve as weighting factors. In case of the head-count ratio, the un-weighted arithmetic mean is derived, as it does not seem a meaningful procedure to us to weight the "poor" by income shares.[9] In a third step, the (weighted) mean of the quarterly and monthly indices, $\bar{I}_a^q$ and $\bar{I}_a^m$, is divided by the annual index for the same year, I_a. The ratio quantifies, in relative terms, the responsiveness of an index to RPI variations. If it is larger (smaller) than 1.0, then the index responds to an RPI reduction with an increase (decrease).

Regarding the two-period mobility measures, an analogous procedure has been implemented. First, mobility indices are derived from the earnings distribution of two consecutive years, E_a and E_{a+1}, and also from the two earnings distributions of the same quarter (month) of two consecutive years, $E_{a,q}$ and $E_{a+1,q}$ ($E_{a,m}$ and $E_{a+1,m}$). Then, the non-weighted arithmetic means of the mobility indices of the four quarters respectively twelve months, $\overline{M}^q_{a,a+1}$ and $\overline{M}^m_{a,a+1}$, are derived, and then divided by the mobility index from the annual earnings distributions, $M_{a,a+1}$.

[9] Our general conclusions are insensitive to using weighted or non-weighted arithmetic means of sub-annual indices as the quarterly and monthly income shares over a year exhibit rather little variation.

Both for the one and the two-period measures, a bootstrap procedure has been implemented to test for statistical significance of the results. Particularly, we draw with replacement 1,000 bootstrap samples from any distribution, and for any bootstrap distribution we compute the aforementioned distributional indices. From the ordered 1,000 bootstrap indices, the 95 percent bootstrap confidence interval is derived using the percentile method.[10]

4 Empirical results

The empirical results are edited in three parts. The first part gives a breakdown of the working sample. The second part provides detailed information on the RPI-distribution nexus for the most recent observation period, year 2006. The third part takes a long-run perspective, studying the distributional trends in annual, quarterly and monthly earnings distributions since German reunification, particularly their responsiveness to RPI variations. Further, all results are decomposed by region, i.e. differentiated by insurants in the New and Old states. Insurants of the New and the Old states are identified by the biographical variable RCEG. For every month of an earnings biography, RCEG indicates whether the remuneration points subject to the New or Old states' legal bases. So, the attribute does not necessarily indicate a person's place of residence.

4.1 Breakdown of the working sample

Annual sample sizes together with socio-demographic information are provided in Table 2. To allow an assessment of the raw data, all the numbers provided in the breakdown are non-weighted.

Altogether, the working sample consists of about 16,500 insurants per year. The age composition of the sample, by construction, is quite stable over time. In every year, the average insurant is about 40 years old. Gross nominal annual earnings (no price adjustment) have increased over the observation period, from EUR 20,710 in 1991 to EUR 29,870 in 2006, a rise of about 44 percent over one and a half decades. The annual earnings growth rates have been particularly high in the early 1990s, i.e. 8.9 percent for 1991/92 and 5.4 for 1992/93. Since 1996, they are systematically lower, varying between 2.9 percent (2000/1) and -0.7 percent (2004/5).

[10] As an alternative to percentile-based confidence intervals, Hall's bootstrap confidence interval (Hall, 1994) is recommended when earnings/incomes are not normally distributed. All our conclusions also hold when Hall's bootstrap confidence interval is derived. The results can be provided by the authors upon request.

The fraction of the non-weighted New states working sample has decreased steadily from about 17 percent in year 1991 to ten percent in 2006.[11] Gross earnings made in the Old and New states differ substantially: In year 1991, nominal gross earnings in the New states amounted to 45.990 percent of the Old state level. During the observation period, a catch up process can be attested, but in year 2006 the divide is still more than 30 percent.[12]

Table 2 about here

The last three columns depict the year-specific typical employment status of the insurants. Particularly, numbers of months spent in unemployment, marginal employment, and full employment are provided. As an example, in year 2000, the average insurant in our working sample has been unemployed during 0.485 months, has been marginally employed over 0.069 months and spent the dominant part of the year, i.e. 11.446 months, in full employment. Due to changes in the German social security code, marginal employees have entered the database since year 1999. Nevertheless, the number of months in a particular year spent in full employment is rather stable over time, varying between 11.391 months in 2004 and 11.664 in 1991.

4.2 A snapshot of the 2006 earnings distribution

Table 3 presents the year 2006 one-period and the 2005/6 two-period indices. The first panel relates to the full working sample, the second to the Old and the third to the New states sample. The regional decomposition reveals additional insights on the RPI-distribution nexus, particularly in the early years when the economic shock waves of Reunification re-echoed (see Section 4.3).

For each sample, three inequality indices (Gini and Theil index, as well as the coefficient of variation), two poverty indices (head count ratio, poverty exit rate), and two mobility indices (Prais, Atkinson mobility index) are provided. The first column gives the point estimates and 95 percent bootstrap confidence intervals of the indices from the distribution of annual earnings. The adjacent columns give two ratios. The Q/A-ratio is the average of the four indices from the four quarters of the year divided by the respective index from the distribution

[11] The statistic should not be confounded with the fraction of the population resident in the New states. Moreover, as explained above, IAS 2006 frequency weights have not been taken into account in this subsection. Of course, weights have always been employed for the computation of the distributional measures.

[12] The assessment ceiling in the New states is lower than in the Old states. For this reason, it is not ruled out that the actual ratio differs (in unknown direction).

of the annual earnings. Analogously, M/A gives the average of the twelve indices from the monthly earnings distributions divided by the respective annual index. If the ratios exceed 1.0, a shortening of the RPI increases the respective index.

Table 3 about here

Inequality

A regional comparison reveals that the overall German distribution is more unequally distributed than both regional earnings distributions. For example, the point estimates of the Gini index from the annual distributions are 0.309 for Germany, 0.300 for the Old and 0.275 for the New states. That the pooling of the regional distributions leads to more inequality is because of the fact that average earnings in the New states are substantially lower than in the Old states, and this causes a non-negligible between-group inequality component. Non-intersecting bootstrap confidence intervals of the New and Old state inequality indices suggest that the regional divide in inequality is statistically significant. For example, the 95 percent confidence interval for the Old state Gini index is [0.297; 0.304] compared with [0.265; 0.285] for the New states.

The existence of assessment ceilings and the resulting top coding of earnings imply that the provided inequality indices underestimate the true level of earnings inequality. In principle, it would be possible to approximate the "true" earnings distribution by imputing earnings of persons with earnings above the assessment ceiling. Indeed, some previous studies using biographical data of Germany's pension insurants similar to ours (e.g., Eberhardt and Schröder, 2010, or Bönke et al., 2011) provide distributional measures from imputed distributions, assuming that the upper part of the earnings distribution follows a Pareto-distribution. However, we have refrained from imputing earnings in the present study as top coding should not prohibit us to assess how RPI variations impact the earnings distribution, the central objective of our study. Instead, it is not ruled out that imputations eventually bias the estimates of the RPI-distribution nexus. Particularly, mobility indices would rest upon assumptions concerning the unknown income ranks of censored units.

The implication of the ratios in columns two and three is that an RPI reduction moderately increases inequality indices. As an example, the point estimate of the Gini index for Germany increases by 1.1 percent when the RPI is reduced from a year to quarter; and by 1.6 percent when it is further reduced to a month. The coefficient of variation, in relative terms, responds quite similarly. Here the point estimate increases by 1.2 percent respectively 1.7 percent. The

Theil index reacts more sensitively to RPI reductions. Compared with the coefficient from the annual distribution, the average Theil coefficient from the quarterly (monthly) earnings distributions is 6.8 percent (9.3 percent) higher. This is because the Theil index is more sensitive to changes in the lower tail of the earnings distribution, and observations with 'exceptionally' low earnings are observed more frequently when the RPI is shortened.

Further, it turns out that the region-specific inequality estimates are more sensitive to RPI reductions than the estimates from the entire distribution. While Q/A-ratios (M/A-ratios) for the Old states and Germany are close, the ratios for the New states are fairly larger, indicating a stronger responsiveness to variations of the RPI. Taking the Q/A-ratio of the Theil index as an example, it is rather similar for Germany and the Old states, i.e. 1.068 vs. 1.086, but with 1.216 substantially larger for the New states. This is because the New state distribution exhibits more sub-annual earnings fluctuations. As a result, the average Gini index from the monthly distributions in the New and Old states, as opposed to the indices from the annual distribution, hardly differ: 0.308 for the Old and 0.303 for the New states.[13] Indeed, the corresponding confidence intervals overlap ([0.304; 0.313] for the Old and [0.288; 0.320] for the New states – see Tables C4a and C4b in the Appendix), indicate that the region-specific estimates statistically do no differ. Accordingly, defining the length of the RPI is not innocuous for inter-regional inequality comparisons, in particular when the annual distribution is more equally distributed in region A compared to region B, but intra-annual fluctuations are larger in the latter.

Poverty

According to the annual individual gross earnings distribution, about 18 percent of the overall sample is classified as poor. The poverty exit rate indicates that about 16 percent of the "poor" in 2005 have escaped poverty in 2006. Comparing the same estimates for the Old and New states it turns out that the incidence of poverty is significantly lower in the New states (10.327 vs. 17.574 percent; confidence intervals do not overlap: [8.898; 11.761] vs. [16.997; 18.163]), and that there are significantly less "poor-to-rich" status reversals in the Old states (14.449 vs. 22.874 percent; confidence intervals: [13.066; 16.411] vs. [16.813; 32.212]).

When interpreting and comparing these numbers with estimates from other studies, two peculiarities of the underlying distributions should be considered. First, indices are derived from distributions of *individual gross* earnings, and individual gross earnings might be a poor

[13] The averaged indices from the quarterly (monthly) distributions can be obtained by multiplying the indices from the annual distributions with the *Q/A*-ratio (*M/A*-ratio).

indicator of material living standard. Particularly, income sources other than earnings from dependent employment, incomes of other household members, as well as the redistributive effects of the tax-transfer system are not reflected in our income concept. Hence, presented head count ratios may be interpreted in the sense of insurants with rather low individual earnings. Second, poverty estimates for the New and Old states are derived using region-specific poverty lines. As average earnings in the New states only made up 69.12 percent of the Old states' average in 2006 (see Table 2 for details), also the relative poverty line is markedly lower in the former, and so are the earnings of the population classified as "poor."

The Q/A- and the M/A-ratio suggest that the two poverty indices respond rather differently to RPI variations. Average head count ratios from the quarterly and monthly distributions hardly differ from their annual analogue. This means that the fraction of individuals counted as poor in a month (quarter), on average, hardly differs from the same fraction derived from the annual distribution. However, equal shares not necessarily guarantee that the "poor" individuals in a particular month are identical with the poor individuals according to the annual distribution. This can be seen from the poverty exit rates. The latter respond to RPI reductions with a prominent rise. Accordingly, there are more short-term dips in poverty than an annual measure would suggest, most plausibly due to short spells of unemployment (and marginal employment since 1999). This interpretation is further supported by the large Q/A- and M/A-ratios in the New states, where unemployment rates,[14] compared with the Old states, are particularly high and earnings are more volatile.

Mobility

Two transition-matrix based mobility indices are provided. The Prais-index (Prais, 1955) gives the mean exit probability from earnings classes (see Appendix A.3 for details). The Atkinson-mobility index gives the fraction of the "mobile" population, i.e. the population *not* remains close to the diagonal of the transition matrix (see Atkinson et al. (1992), p. 31f. and Appendix A.3 for details).

We find similar mobility levels for Germany and the Old states. The point estimate of the Prais (Atkinson mobility) index for the German earnings distribution in Germany is 0.180 (0.011) and 0.177 (0.012) for the Old states. Overlapping confidence intervals suggest that these differences are insignificant. For the New states, the mobility indices from the annual

[14] For official statistics on the regional unemployment rates see Appendix B.2.

distribution are significantly higher, i.e. 0.217 for the Prais and 0.017 for the Atkinson mobility index.

The regional mobility divide is further accentuated when the RPI is shortened to a quarter or a month. Both mobility indices respond to an RPI reduction with an increase, a robust finding for Germany, the Old and the New states. Particularly strong is the reaction of the Atkinson mobility index for the New states with $Q/A = 1.762$ and $Q/A = 1.827$ as opposed to $Q/A = 1.045$ and $Q/A = 1.050$ for the Old states.[15] The regional differences in the ratios, however, should not be overemphasized, as confidence intervals for the New state sample are quite large. Indeed, the subsequent inter-temporal analysis will show that the regional difference in the ratios is usually smaller.

The 2006 distributions of monthly earnings

We proceed with a detailed monthly-level analysis. Particularly, Figure 1 reveals the spread of the inequality, poverty and mobility indices over the twelve (24) monthly distributions of the year 2006 (2005/6) earnings distributions. Altogether, the Figure comprises eight graphs, seven for the distributional indices, and one for the month-specific total earnings relative to total annual earnings. Abscissas indicate the twelve months of the year, point estimates are indicated by an "x", and vertical lines give the corresponding 95 percent bootstrap confidence interval.

Figure 1 about here

A perfectly even distribution of earnings over the twelve months of the year would imply an earnings share of 8.333 in every month. As can be seen from the upper left graph of Figure 1, this is not the case. Instead, July, August and October contribute more than average shares to total annual earnings. High employment rates in the service sector and vacation bonuses in the summer months are likely explanations. February, on the opposite, contributes the least to total annual earnings, with short-term working arrangements and temporary unemployment in the craft-based industries and the service sector being the most important reasons.

Indeed, as can be seen from Table B2 in the Appendix, unemployment rates in the year 2006 winter months January to March varied around 12 percent, about 2 percentage points more

[15] Assessment ceilings are lower in the New compared to the Old states, leading to narrower income classes in the former. It is likely that the different widths of income classes contribute to the responsiveness of mobility ratios to RPI variations in the New states.

than in the other months. In the winter months also the number of short-term contracts was significantly higher: From January to March, about 100,000 persons had a short-term contract. In July the number was 50,000 persons, 36,000 in November, but in December the number again had almost doubled. Rates of unemployment and short-term employment were particularly high in the New states, with unemployment rates ranging between 19.5 percent (February) and 15.5 percent (November).

These sub-annual labor market volatilities are reflected in the month-specific inequality indices. The Gini and Theil coefficient and also the coefficient of variation are significantly higher in the winter months (January to March) compared to the rest of the year. Also the head count ratio is higher in the winter months, whereas poverty-exit rates exhibit no statistically significant variation. Concerning the considered mobility indices, the point estimates of both the Prais and Atkinson mobility index, compared with the rest of the year, are higher in the winter months. The difference, however, is usually insignificant. Only the Prais index for January is significantly different from the same index for August and September.[16]

4.3 Inter-temporal trends

This section answers the question whether our conclusions on the RPI-distribution nexus from the year 2006 snapshot can be generalized over time, and whether the RPI impacts distributional trends and patterns. We start off with an analysis for Germany, and then proceed with an Old-New-states comparison.

4.3.1 Analysis at the national level

Figures 2-4 provide the trends for Germany, with Figure 2 depicting the inequality, Figure 3 the poverty, and Figure 4 the mobility trends. As in the previous section, indices from the quarterly and monthly distributions are averaged over the period of a year. Each of the three Figures provides five graphs for every distributional index. Hereby, the graphs for each distributional index are assembled in a separate column. The graph in the first row always gives the index values from the annual earnings distribution of the period from 1991 to 2006. Graphs in the second and third row depict the average indices from the quarterly and monthly earnings distributions. In the fourth and fifth row, the Q/A- and M/A-ratios are provided. For the two-period measures, the abscissa gives the year of the second observation period. All

[16] For the derivation of the sub-annual mobility indices see Appendix A.3 for details.

point estimates and confidence intervals can also be found in Tables C1 to C3 in the Appendix.

Inequality

We comment on inequality first. As can be seen from Figure 2 and also from Table C1 in the Appendix, all three inequality indices indicate a significant decrease in annual earnings inequality between 1991 and 1992, a long period of constant inequality until the early 2000s,[17] and a significant inequality rise during the last years. As an example, the point estimate of the Gini index from the annual distribution declined from 0.275 to 0.264 between 1991 and 1992 [confidence intervals is [0.271; 0.278] in 1991 compared with [0.261; 0.267] in 1992], varied around 0.26 to 0.27 from then until year 2002, before rising significantly from 2002 to 2006, reaching a peak of 0.309 in the last observation period.[18] For the quarterly and monthly distributions, we find the same significant inequality decline between 1991 and 1992, followed by a period of stagnation, and a significant rise in inequality between 2002 and 2003 and again between 2004 and 2005.

As can be seen from the significantly larger than unity Q/A- and M/A ratios, extending the RPI smoothes out short term fluctuations of earnings, and this in turn translates into lower levels of measured inequality. Further, for all three inequality indices the Q/A- and M/A ratios not change much during the period 1991 to 2002/3. For example, reducing the RPI from a year to a quarter (month) increased the Gini index of individual earnings by about 1.5-1.7 percentage points (2.2-2.6 percentage points). Since 2003 the Q/A- and M/A ratios have decreased slightly both for the Gini and the Theil index, suggesting that sub-annual earnings fluctuations became quantitatively smaller in the latter years of the observation period. The Q/A- and M/A ratios of the coefficient of variation for year 2004, however, tend in the opposite direction.

Inequality estimates for all three RPI consistently suggest a rather long period with constant levels of inequality between 1992 and 2002, an a rise in the most recent years of the surveyed period. The RPI, however, impacts the significance levels of the inter-temporal comparisons. Sometimes the inequality indices for two consecutive years are significantly different when the RPI is a year, but the difference is insignificant when the RPI is a quarter or a month. This

[17] Particularly, inequality estimates for the periods 1998 and 1999 as well as for 2000 and 2001 hardly differ.

[18] Since 2003, assessment ceilings in the New states have been increased rather moderately, and have been left almost unaltered in the Old states. Accordingly, the recent rise in inequality is not due to data peculiarities but should reflect changes in the actual gross earnings distribution. This is reconfirmed by the decomposed estimates by Old and New states that follows in Section 4.3.2.

can be seen both from Figure 2 and from Table C1 in the Appendix. For example, when the RPI is a year, Gini indices suggest a significant rise in inequality between 2003 and 2004: the point estimates for the two years are 0.290 and 0.296, and the confidence intervals are non-intersecting ([0.287; 0.293] vs. [0.293; 0.300]). When the RPI is a quarter of a month, however, the respective confidence intervals intersect, suggesting that the inter-temporal inequality increase is insignificant. Similar RPI-related effects pertain the Theil index (comparison of the years 2003/4 or 2004/5), and the coefficient of variation (of 2003/4 or 2004/5). However, conflicting results, i.e. a significant inequality increase (decrease) from one year to another when the RPI is a year but a significant decrease (increase) when the RPI is shortened to a quarter or a month, have not been detected.

Figure 2 about here

Poverty

Results for the two poverty measures are graphically illustrated in Figure 3 while Table C2 in the Appendix provides all the numerical estimates. The head count ratio exhibits a u-shaped pattern over the observation period, i.e. higher incidences of earnings poverty in the early 1990s and 2000s compared with the mid/late 1990s. This is a consistent result for all three RPI. For the poverty exit rate, the inter-temporal pattern is different. The poverty exit rate is particularly high for 1991/2, then drops substantially for 1992/3, and moderately declines since then. As an example, for the annual earnings distribution we find that 28.507 percent of the insurants classified as poor in 1991 have climbed out of poverty in year 1992. For the observation period remaining, poverty exit rates vary around 20 percent in the mid and late 1990s, indicating that every fifth poor insurant in a particular year is classified as non-poor in the adjacent period. In the 2000s, poverty exit rates have further decreased. For the year 2006, its point estimate varies between 16.108 percent for the annual earnings distribution and 17.799 for the monthly distribution. Accordingly, there is a tendency for positions at the bottom of the earnings distribution to become (more) sticky.

Figure 3 about here

In general head count ratios and poverty exit rates respond rather insensitive to RPI variations. Typically, head count ratios decrease when the RPI is shortened, but the reaction is small in quantitative terms. Point estimates from the quarterly distributions are about 2.1

percent lower than the annual estimates.[19] Further reducing the RPI to a month leads to a reduction by another 1.3 percent. Concerning the poverty exit rates, an RPI reduction is associated with a higher frequency of status changes from poor to non-poor. Typically, point estimates of the poverty exit rate increases by about 12.4 percent (14.4 percent) when the RPI is reduced from a year to a quarter (month).[20]

Like for the inequality indices, RPI variations concern the statistical significance of poverty patterns and trends. For example, the head count ratio derived from the 1992 annual earnings distribution is significantly lower than for year 2004, while confidence intervals of the indices from the quarterly and monthly distributions suggest that the decline is insignificant. Another example relates to the inter-temporal comparison of the poverty exit rates for 1994/5 and 1995/6. For the annual earnings, the decline is significant but insignificant for the quarterly and the monthly distributions. Consistently with our previous findings outright reversals due to RPI variations are never observed in our data.

Mobility

Both the Prais and Atkinson mobility index usually exhibit little variation over the observation period. Only immediately after reunification significantly higher mobility levels are observed (1991/2), and in the last three years mobility declines slightly. These trends are insensitive to the choice of the RPI.

An RPI reduction, however, impacts the level of measured mobility. As indicated by the Q/A- and M/A-ratios, reducing the RPI from twelve to three months or to a single month translates into an about four percent rise of the Prais index. For the Atkinson mobility index, the respective rise is about 21 when the RPI is shortened to a quarter, and 26 percent when it is shortened to a single month. The Atkinson mobility index from the 1991/2 distributions is particularly sensitive to RPI reductions. Back then, the sub-annual indices exceed the annual by about 50 percent. Apparently, a rapid economic transition, here the German reunification shock, drive a particularly large wedge between mobility indices derived from monthly, quarterly and annual distributions.

Figure 4 about here

[19] The number is obtained computing the *Q/A*-ratios from the point estimates of the annual and quarterly head-count ratios for years 1991 to 2006 and averaging these ratios over the whole observation period.

[20] The number is obtained computing the *Q/A*-ratios (*M/A*-ratios) from the point estimates of the annual and quarterly poverty exit rates and averaging these ratios over the whole observation period.

Results from the inequality, poverty and mobility analysis can be summarized as follows. First, inequality and mobility indices (including poverty exit rates) and the accounting period of income are inversely related, while the opposite holds for the head count ratio. Second, in the early years after German reunification, a period of rapid economic transition and high sub-annual volatility of earnings, the distributional indices are particularly responsive to RPI variations. Third, the RPI affects the quantitative estimates of all the distributional indices, but leaves the inter-temporal distributional patterns and trends, in general, unaffected. The RPI, however, sometimes impacts the significance levels of inter-temporal changes of distributional measures.

4.3.2 Trends for Germany's Old and New states

The omnipresent role of the state in the former German Democratic Republic implied that the dominant part of income was received through state mediation. In particular, wages were paid to employees working in state-owned enterprises or in the government and the earnings differentials were small – at least compared with capitalist market-oriented economies. As a result, the earnings distribution in the former German Democratic Republic, as in other socialist regimes, was quite flat. After Reunification, however, the system was transformed rapidly to a market economy, including the adaption of labor market institutions, causing numerous company bankruptcies, high job fluctuation and rising unemployment rates.

In the following, we deal with the question whether and how the RPI impacts distributional trends and patterns at the level of Germany's Old and New states. Our findings from year 1991 and on are summarized in Figures 5 to 7b. Inequality indices for the Old and New states are provided in Figures 5a and 6b; poverty indices in Figures 6a and 6b; and mobility indices in Figures 7a and 7b. All the Figures build on the concepts in introduced in Subsection 4.3.1. The actual values of the distributional indices for the two parts of Germany are provided in Tables C4a to C6b in the Appendix.

Inequality

As can be seen from the Figures 5a and 5b, the distribution of gross individual earnings in 1991 was more equal in the New compared with the Old states. Back then, the point estimates of the Gini index, the Theil index and the coefficient of variation from the annual earnings distribution amounted to 0.224, 0.086 and 0.405 in the New states compared with 0.237, 0.094 and 0.414 in the Old states. However, only the Gini indices significantly differ (see confidence intervals in Tables C4 and C5 in the Appendix).

Figures 5a and 5b about here

When the RPI is shortened to a quarter or a month, the regional divide becomes insignificant for all three indices. Indeed, point estimates of the three inequality indices even suggest more inequality in the New compared to the Old states. This is because the RPI has a more pronounced effect on measures of inequality in the former: Both the Q/A- and the M/A-ratio point to a more volatile sub-annual earnings distribution in the New states. For example, in year 2006 decreasing the RPI from twelve to three (month) months, on average, increases the Theil index of individual earnings by about 21.6 percent (30.2 percent) in the New and by 8.6 percent (11.7 percent) in the Old states.

Over time, inequality levels evolved differently in the two parts of Germany. The distribution in the New states became significantly more unequal in the 1990s, and remained rather stable since then. For the Old states, on the contrary, a pronounced inequality rise is apparent in the last years of the observation period. These results are not affected by the length of the RPI.

Poverty

Regional poverty indices rely on region-specific poverty lines, defined as half of the respective median of gross individual earnings (see Appendix A.2 for details). Figures 6a and 6b give a graphic overview of the results, and all the underlying estimates can be found in Tables C5a and C5b in the Appendix.

Figures 6a and 6b about here

We comment on the head count ratios first. For the Old states, head-count ratios remain about constant during the first decade, and rise significantly during the last five years of the observation period. I.e., the annual head count ratio from the annual distribution varies around 14 percent until 2002, and then rises to 17.574 by year 2006. For the New states, head count ratios are usually lower, and also the inter-temporal pattern is different. The index first rises slightly until the mid 1990s (from around ten to about 15 percent), then remains about constant until 2004, and then drops to its initial level. The different inter-temporal trends imply a significantly lower incidence of poverty in the New compared to the Old states in the early 1990s and the late 2000s. For the period in between, results are usually insignificant.

The length of the RPI does not impact these results. As can be seen from the Q/A- and the M/A-ratios, head count ratios are rather insensitive to RPI variations. Most ratios are not different from 1.0, and they do not show prominent inter-temporal variation. To sum up, changing the RPI neither impacts the poverty trends nor regional comparisons of poverty levels.

For the poverty exit rates, Q/A- and M/A-ratios reveal systematic regional differences. Although the divide reduces over time, ratios are markedly higher in the New states. For example, according to the point estimates between year 1991 and 1992 about 43 percent (54 percent, 57 percent) of the surveyed New state population climbed out of poverty when the RPI is a year (a quarter, a month). This is equivalent to a Q/A-ratio of 1.264 and a M/A-ratio of 1.314 (point estimates). For the Old states, these rates are markedly lower, i.e. $Q/A = 1.160$ and $M/A = 1.162$. Until 2006, poverty-exit rates have fallen markedly in both the New states and the Old states. However, the decline is quantitatively stronger in the New states. Here, the point estimate from the annual distribution drops by 46.858 percent from 43.043 (1991/2) to 22.874 (2005/6). For the Old states, the poverty exit rate declines by 19.582 percent (from 18.027 to 14.449). Due to the substantial regional divide in poverty-exit rates, the regional differences in the Q/A- and M/A-ratios, however, do not impact the regional comparison of poverty exit rates. That the poverty exit rates are higher in the New states holds for all the reference periods of income.

Mobility

Last, some comments on the regional mobility indices. As can be seen from Figures 7a and 7b, both the Prais and Atkinson mobility indices from the annual, quarterly and monthly distributions indicate that mobility was particularly high in the early years after Reunification. For the period remaining, say after 1994, both indices remain about constant, with another slight downward trend from 2000 and on. Comparing the estimates the New and the Old states, the New states distribution of earnings exhibits significantly more mobility. Taking the 1991/2 point estimate of the Prais (Atkinson mobility) index for the annual RPI as an example, it is 0.510 (0.086) in the New states compared with 0.325 (0.025) in the Old states. Over time, the regional mobility divide gets smaller, yet it does not disappear and remains significant until the late 1990s / early 2000s. All of the qualitative results are robust to RPI variations.

For the Prais index, the Q/A- and M/A-ratios reveal that differences in measured mobility levels in the annual, quarterly and monthly earnings distributions are quantitatively small. For the New states, most confidence intervals include the critical value 1.0, indicating that differences are statistically insignificant. For the Old states, RPI reductions in several years increase the level of measured mobility significantly, but the effect is small in quantitative terms (usually less than five percent). For the Atkinson mobility index, the ratios are larger, indicating a stronger responsiveness of the measure to RPI variations.

Indeed, for the period from 2000 and on, regional comparisons of mobility levels are sensitive to the definition of the RPI. Take the Prais index for the years 2002/3 as an example. For this period, the bootstrap confidence intervals from the annual earnings distributions are [0.235; 0.301] in the New compared with [0.197; 0.214] in the Old states, indicating a significantly higher mobility level in the former (see Tables C7a and C7b in the Appendix for details). When the RPI is a quarter (month), however, the respective confidence intervals are [0.232; 0.353] and [0.205; 0.235] ([0.231; 0.355] and [0.205; 0.236]), thus overlap, and indicating that the difference is insignificant.

Figures 7a and 7b about here

In sum, the regional-level analysis revealed that the normative choice of a particular RPI is not innocuous for regional comparisons of distributional measures. Together with the results from the previous sections this finding has two implications. First for inter-temporal and regional comparisons to be meaningful a consistent accounting period of income is required. Second, it is not ruled out that distributional trends and patterns are sensitive to the length of the RPI, particularly when significance levels are concerned.

5 Concluding remarks

Today, income micro data from multiple countries are available for studying patterns and trends of inequality, poverty and mobility. Sometimes, these data rely on the concept of a current monthly income, sometimes on a quarterly income, and sometimes on a (smoothed) annual income, possibly restricting the comparability of the derived distributional measures. Interestingly, little is known about the effect of the length of the income accounting period on distributional measures, both theoretically and empirically, and the present study represents an attempt to shed some empirical light on the issue.

Particularly, we have documented patterns and trends of inequality, poverty and mobility from distributions of monthly, quarterly, and individual annual gross earnings from German administrative records between 1991 and 2006.

Our results can be summarized as follows. Inter-temporal patterns of inequality, poverty and mobility indices in general seem to be rather robust to variations of the reference period of income. However, we have shown that different distributional indices react differently to RPI variations, and that the quantitative effects are both time and region specific. Particularly, in periods of rapid economic transition (here: after German Reunification) which are particularly interesting for distributional analysis, e.g. the years around the financial crisis, the RPI may strongly impact distributional measures. Accordingly, regional and inter-temporal comparisons of distributions should rest on databases compiled with an identical reference period of income.

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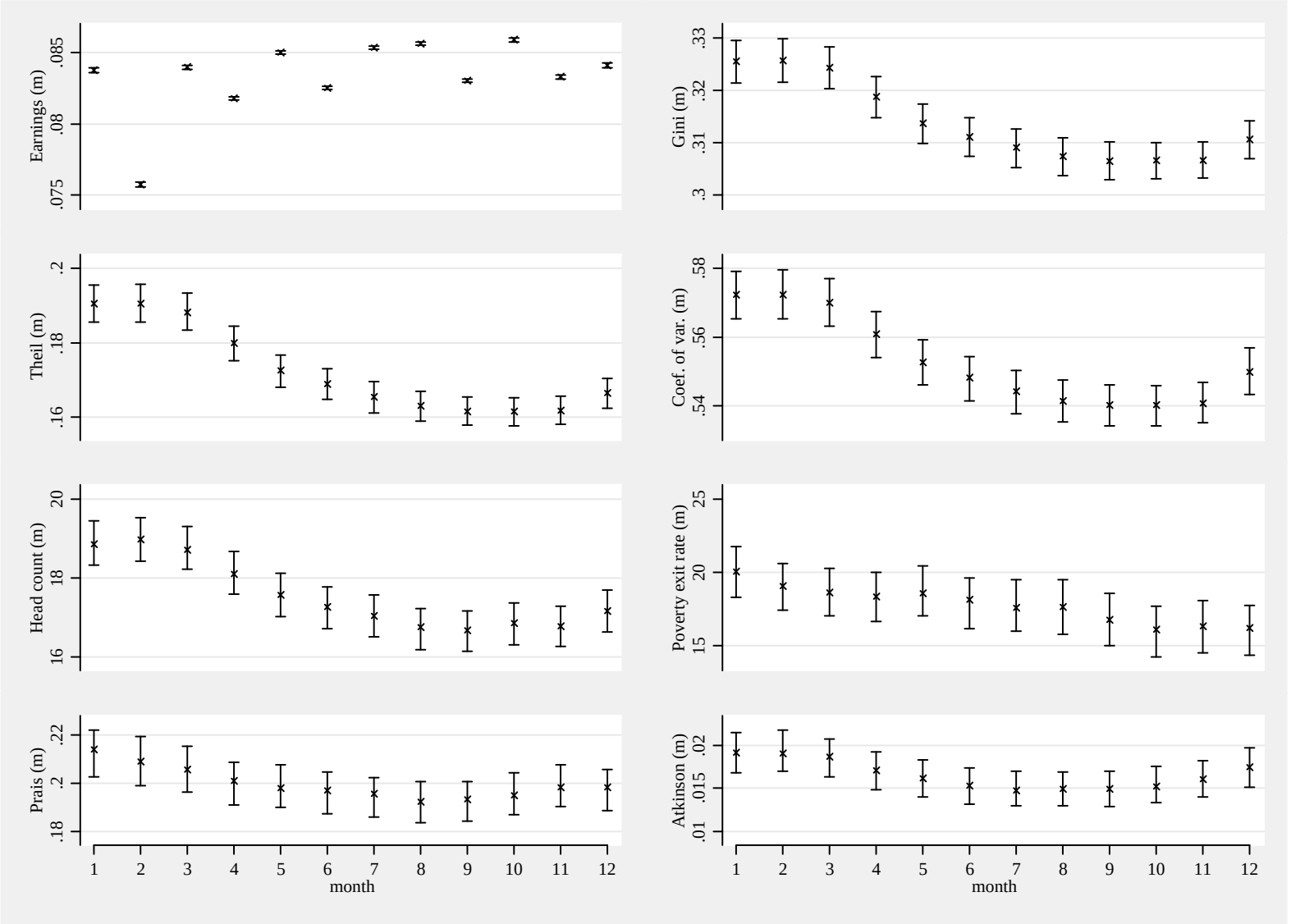
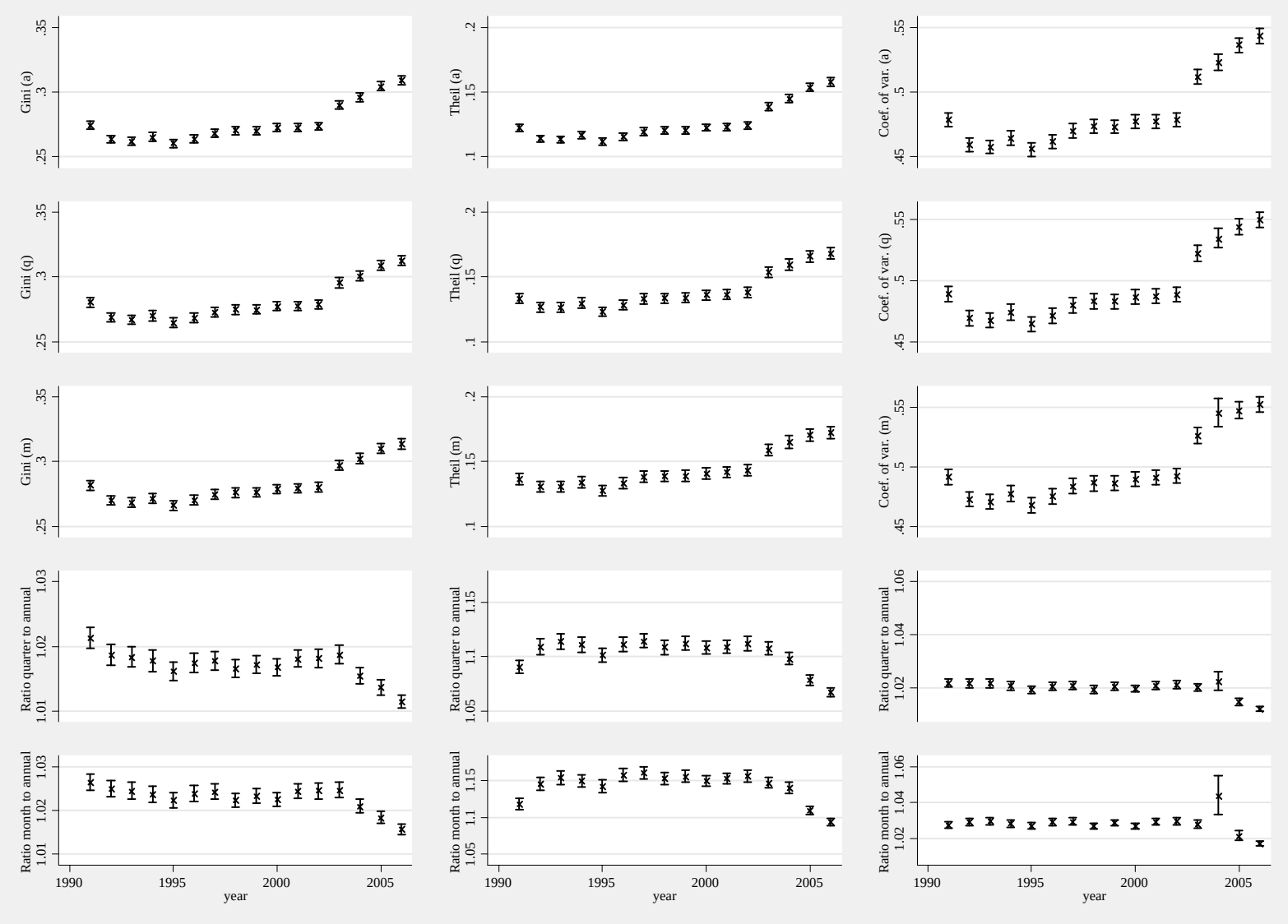
Figure 1. Month-specific estimates for year 2006, Germany



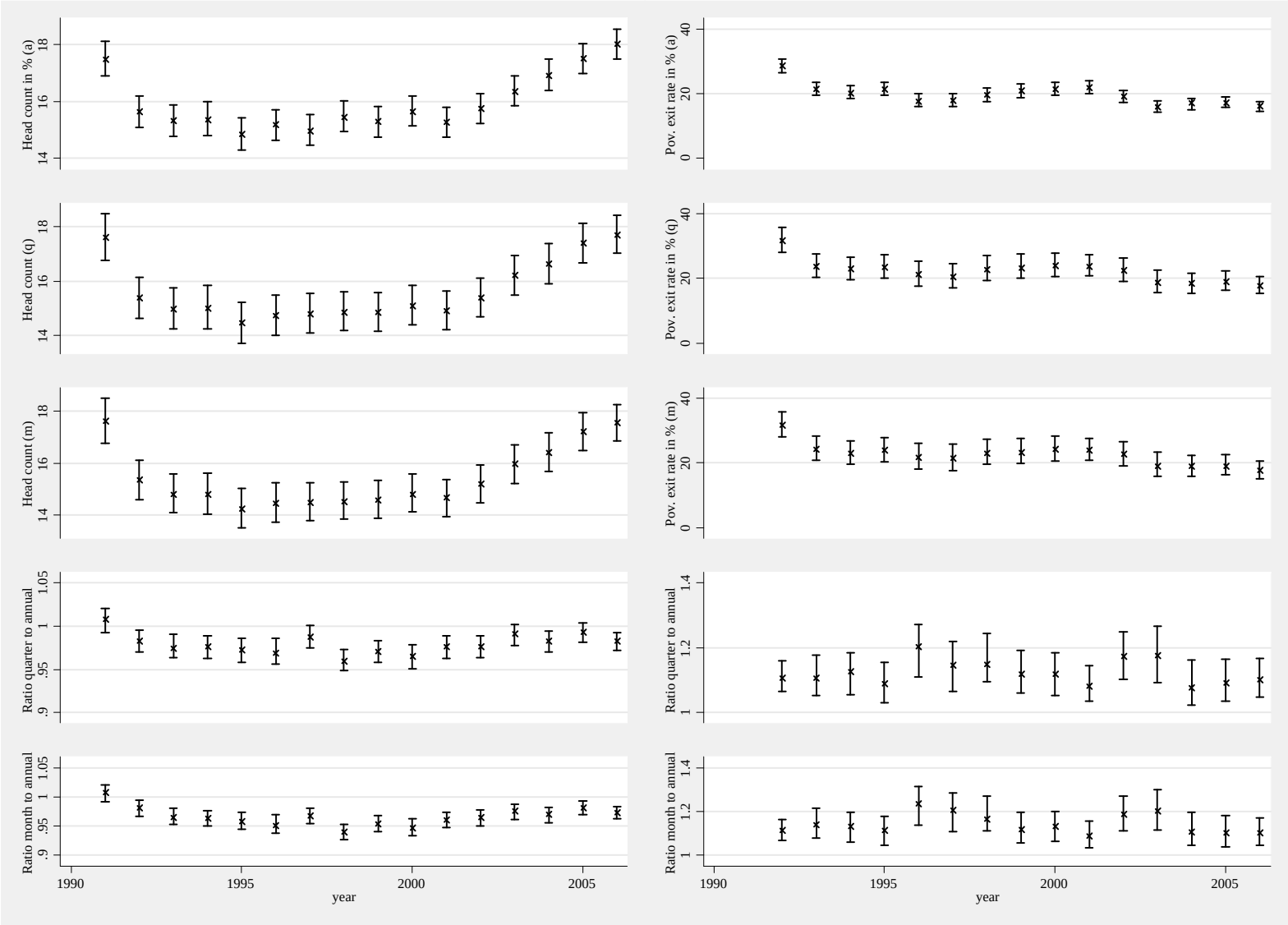
Note. Database is IAS 2006. Own calculations. Month "1" refers to January, "2" to February, and so on. Vertical bars: bootstrap confidence intervals; "x": point estimate.

Figure 2. Inequality trends for period 1991 to 2006; Germany



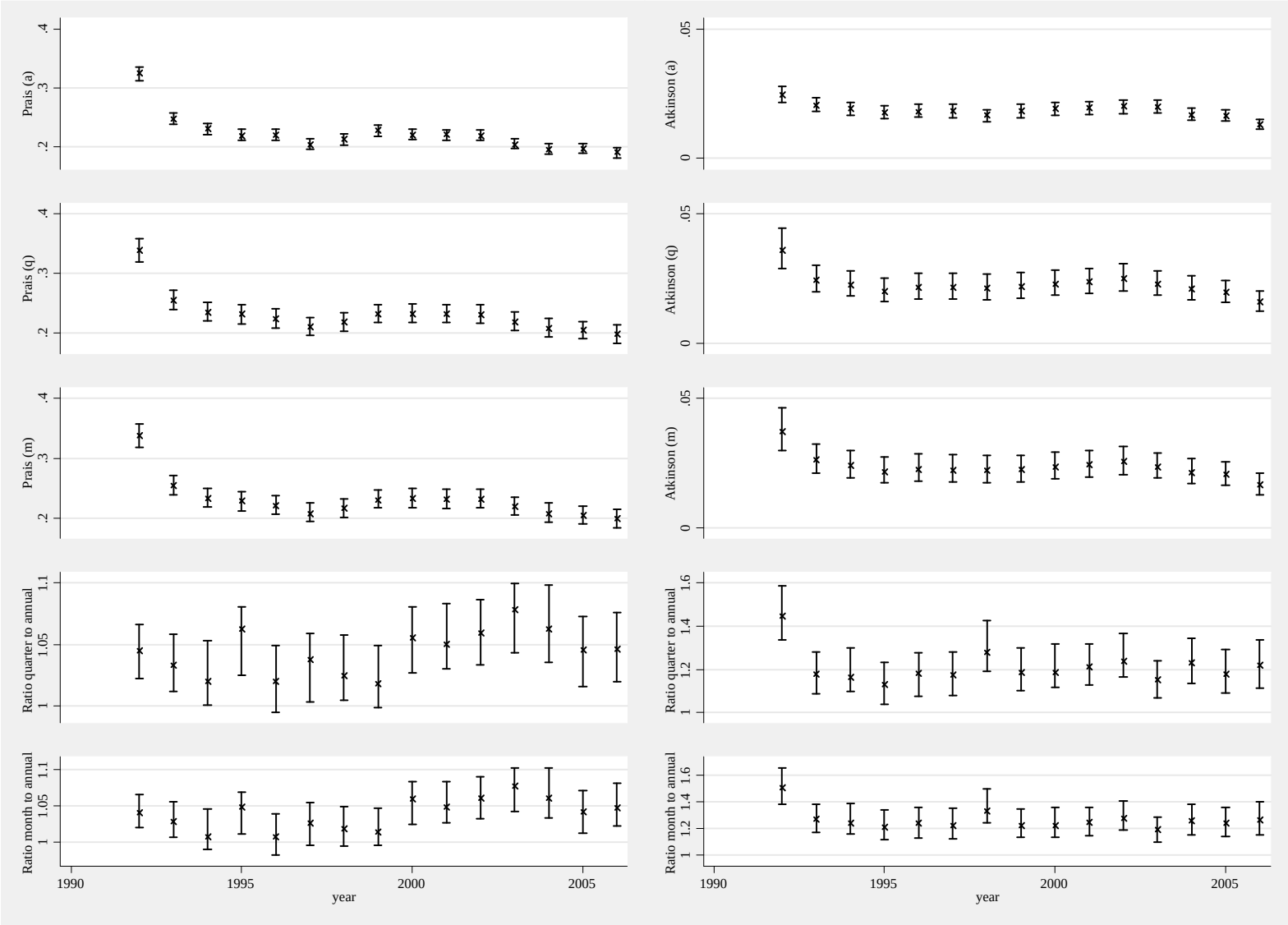
Note. Database is IAS 2006. Own calculations. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 3. Poverty trends for period 1991 to 2006, Germany



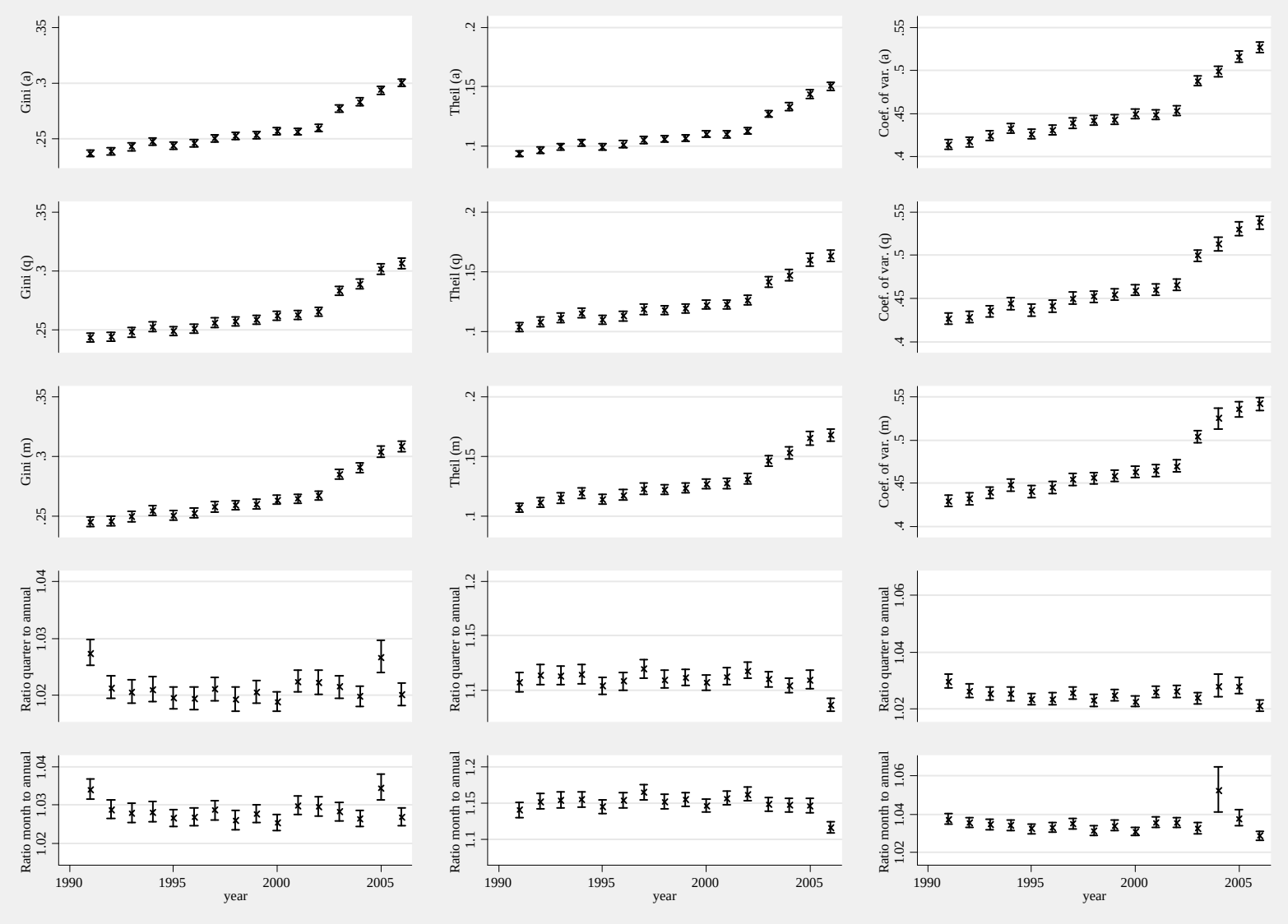
Note. Database is IAS 2006. For poverty-exit rate: “year” is the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 4. Mobility trends for period 1991 to 2006, Germany



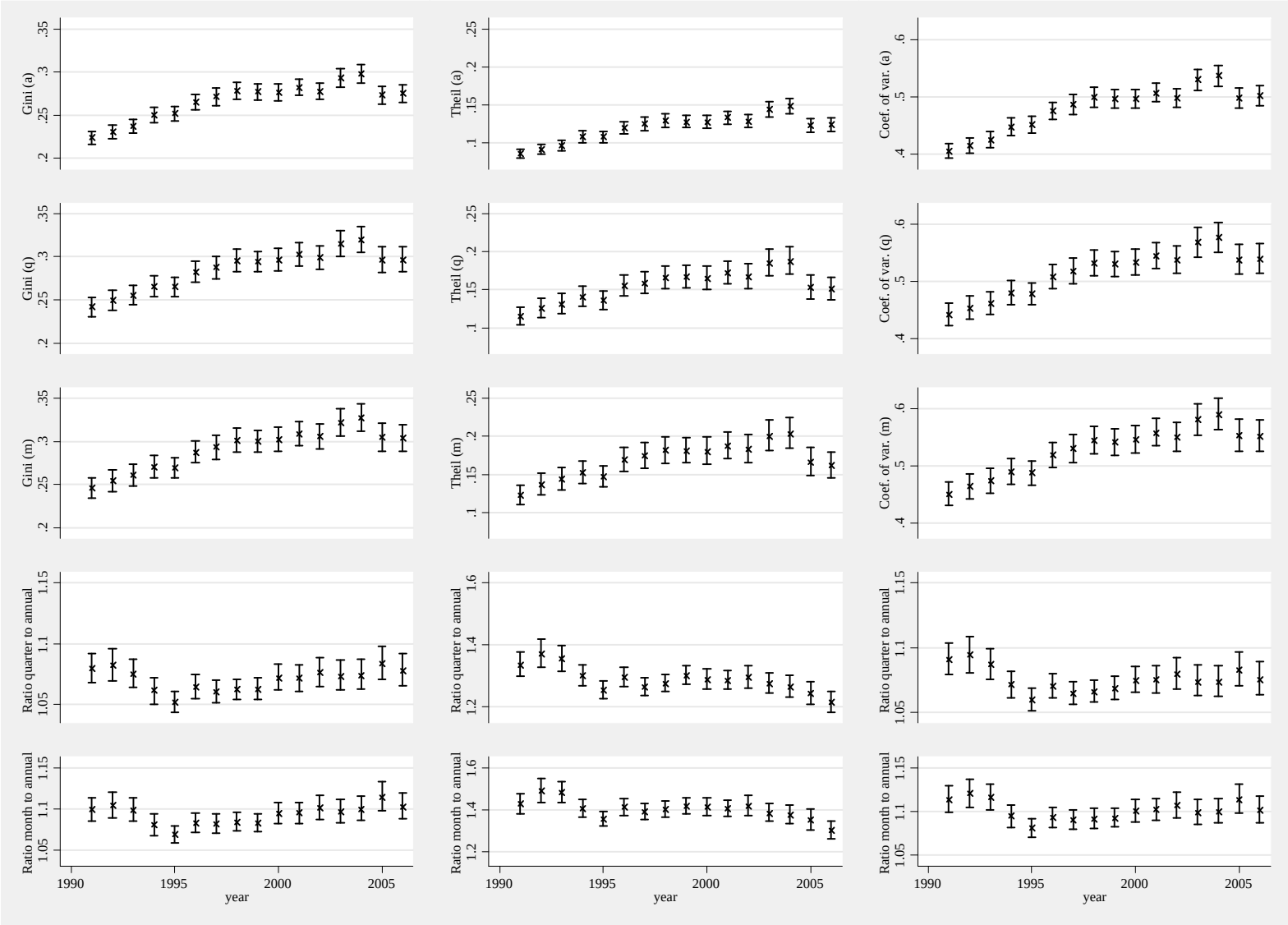
Note. Database is IAS 2006. “Year” indicates the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 5a. Inequality trends for period 1991 to 2006; Old states



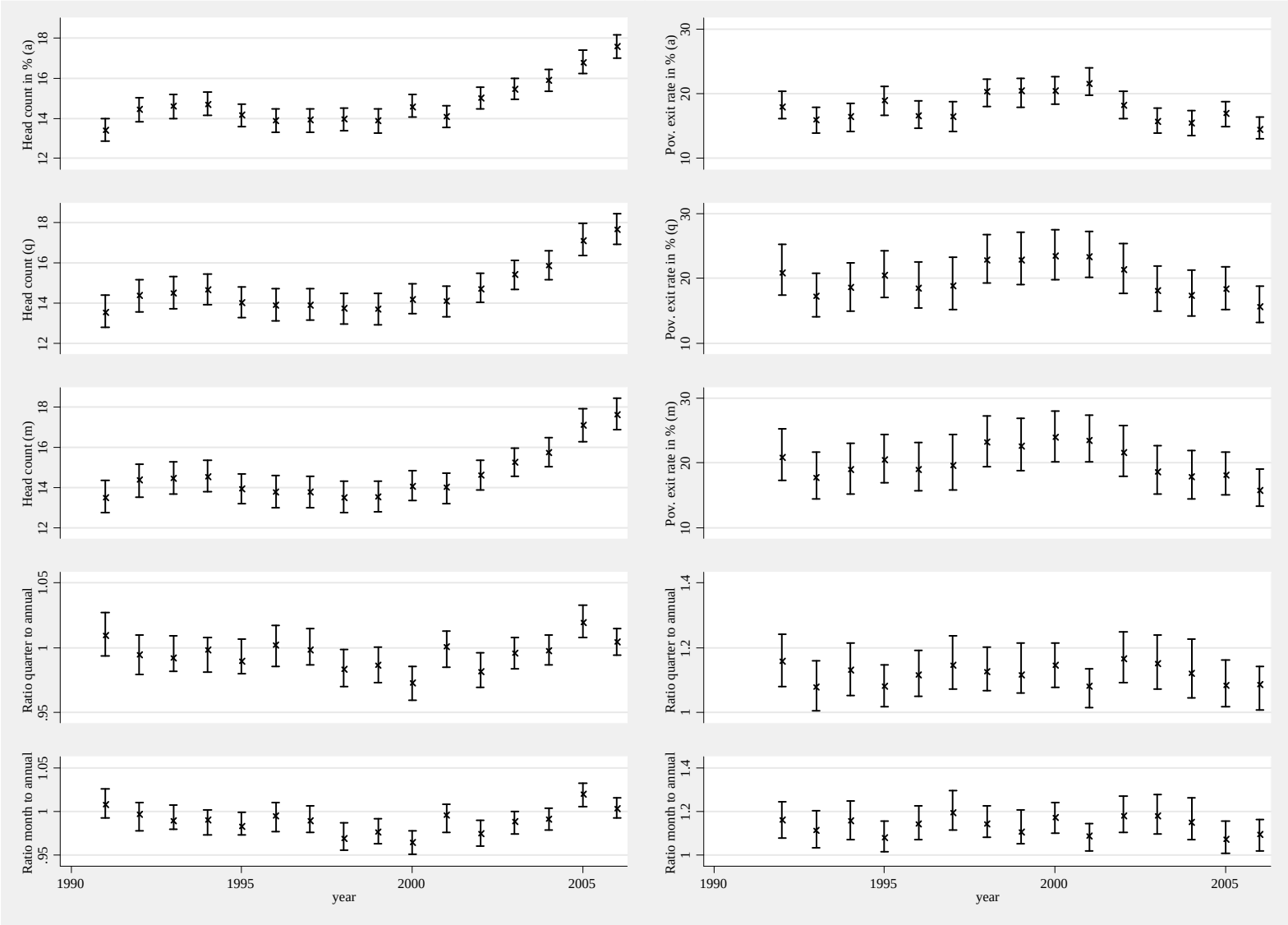
Note. Database is IAS 2006. Own calculations. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 5b. Inequality trends for period 1991 to 2006; New states



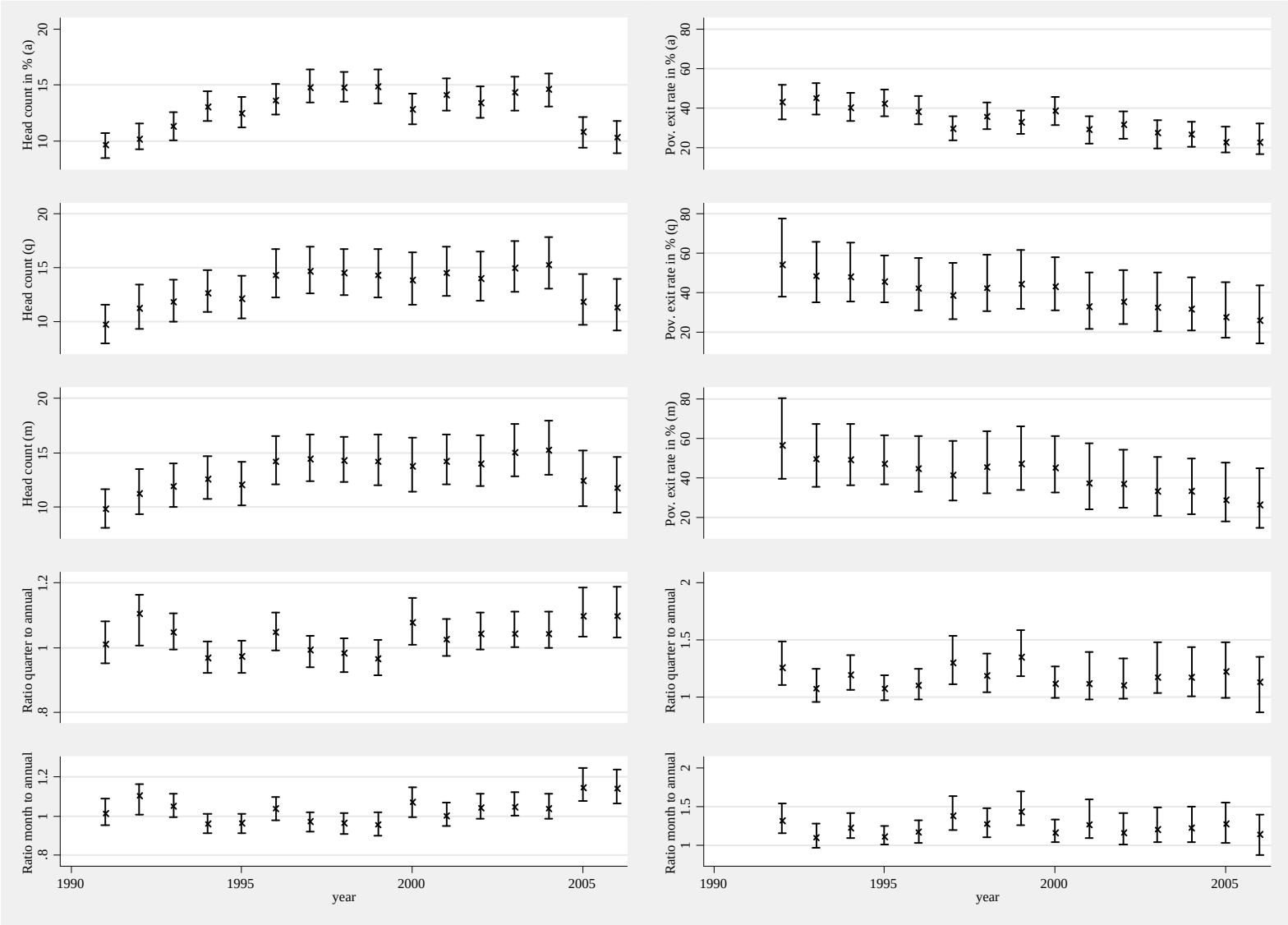
Note. Database is IAS 2006. Own calculations. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 6a. Poverty trends for period 1991 to 2006, Old states



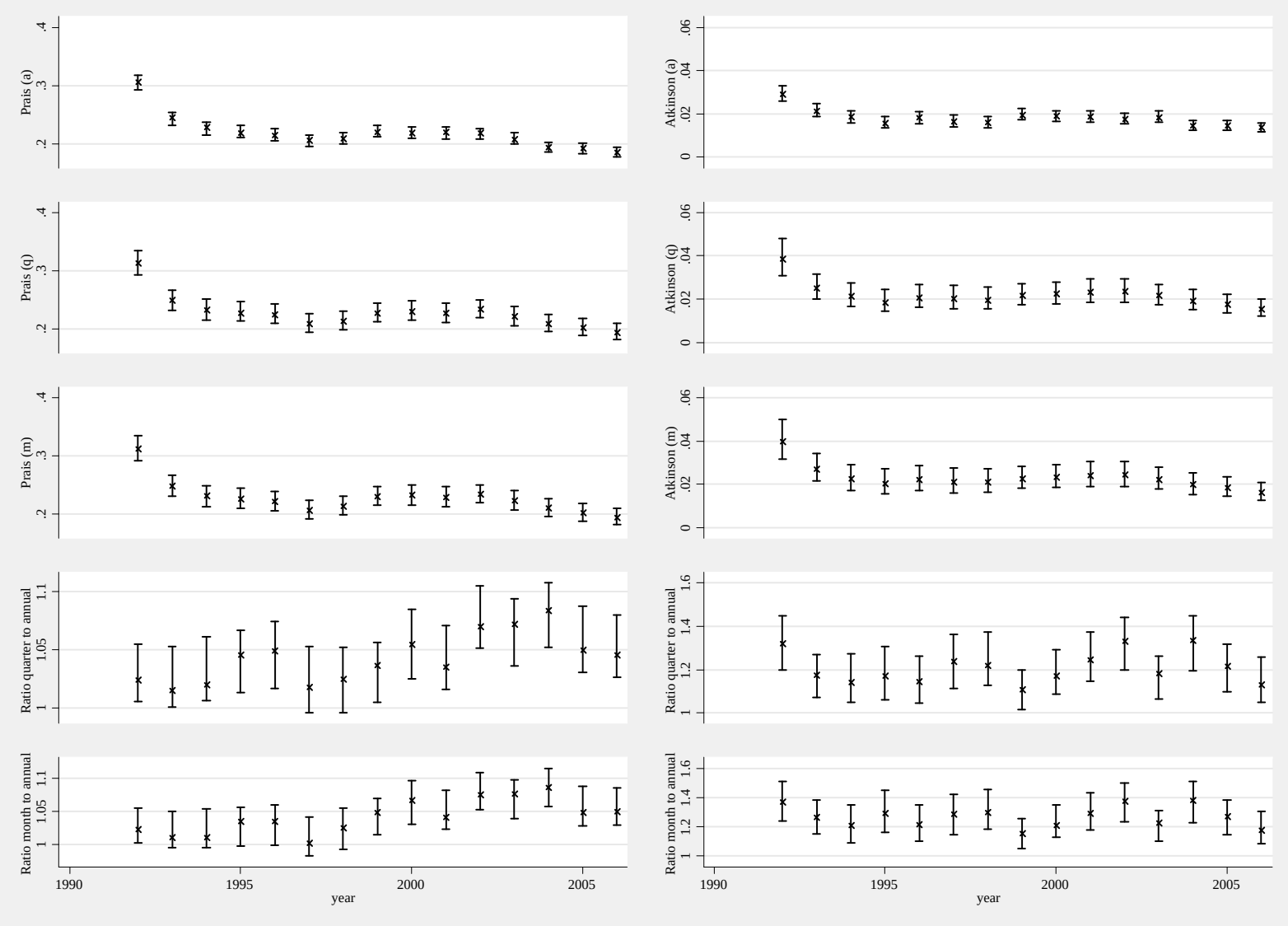
Note. Database is IAS 2006. For poverty-exit rate: “year” is the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 6b. Poverty trends for period 1991 to 2006, New states



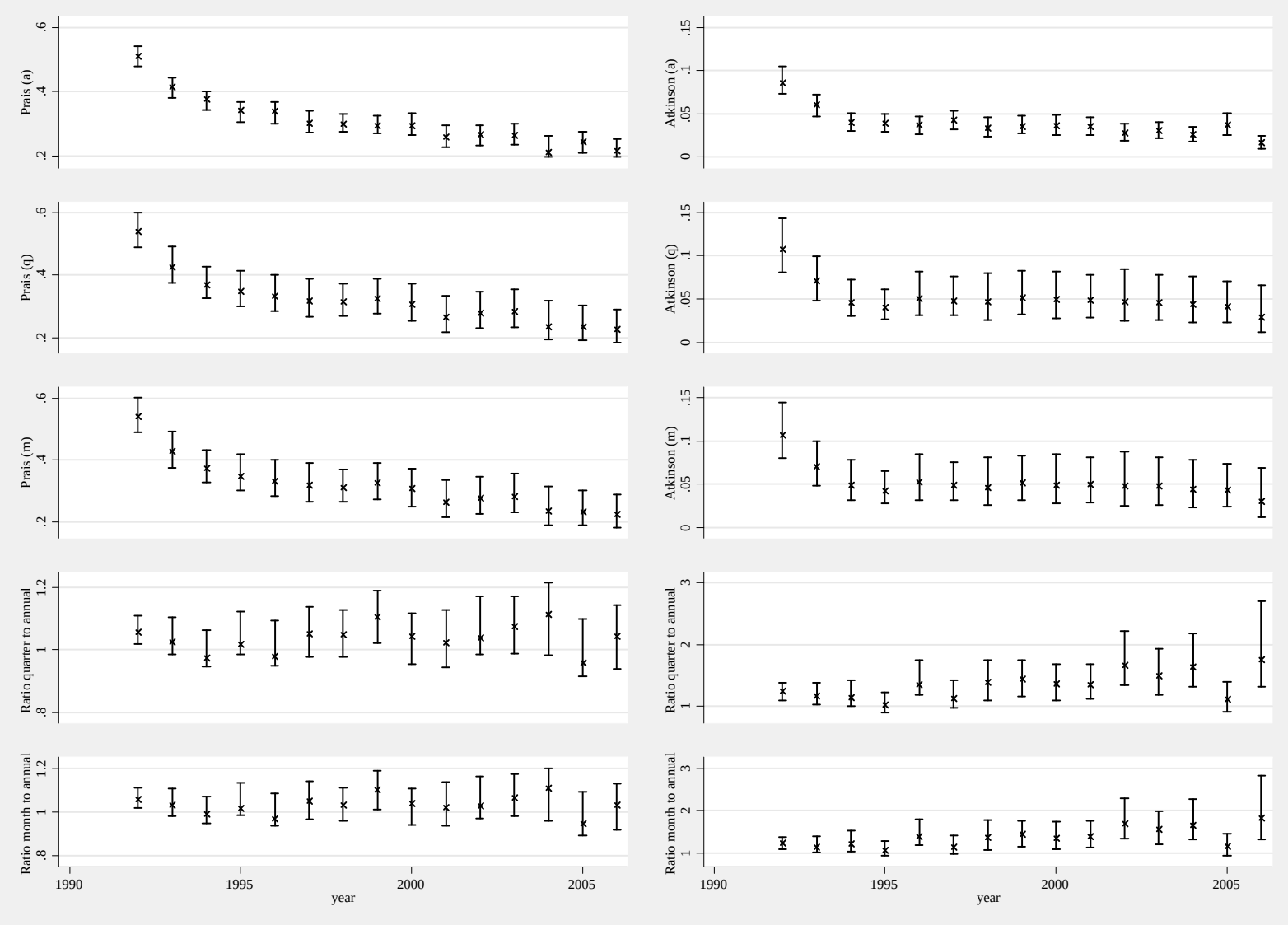
Note. Database is IAS 2006. For poverty-exit rate: “year” is the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 7a. Mobility trends for period 1991 to 2006, Old states



Note. Database is IAS 2006. “Year” indicates the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Figure 7b. Mobility trends for period 1991 to 2006, New states



Note. Database is IAS 2006. “Year” indicates the second observation period. Vertical bars: bootstrap confidence intervals; “x”: point estimate.

Table 1. Results from previous literature

Author	Country code	Period	Reference period of income	Distributional measure	Estimate	Ratio short-term to normal (in %)	Ratio short-term to annual (in %)
Morris and Preston (1986)	UK	1968	Current	Gini	0.2806	107.222	105.094
			Normal		0.2617		
			Annual		0.2670		
			Current	Coefficient of variation	0.5865	106.366	105.126
			Normal		0.5514		
			Annual		0.5579		
			Current	Headcount ratio	0.1322	132.864	116.476
			Normal		0.0995		
			Annual		0.1135		
		1977	Current	Gini	0.2771	103.088	100.181
			Normal		0.2688		
			Annual		0.2766		
			Current	Coefficient of variation	0.5361	102.938	94.301
			Normal		0.5208		
			Annual		0.5685		
			Current	Headcount ratio	0.1217	116.015	104.914
			Normal		0.1049		
			Annual		0.1160		
		1983	Current	Gini	0.2887	102.122	93.886
			Normal		0.2827		
			Annual		0.3075		
			Current	Coefficient of variation	0.5586	101.804	85.531
			Normal		0.5487		
			Annual		0.6531		
			Current	Proportion of poor	0.0649	115.480	65.888
			Normal		0.0562		
			Annual		0.0985		
Nolan (1987)	UK	1977	Current	Coefficient of variation	0.7294	n.a.	104.185
			Annual		0.7001		
Ruggles (1990)	US	1984	Monthly	Headcount ratio	0.137	n.a.	124.545
			Annual		0.110		
Böheim and Jenkins (2006)	UK	1991	Current	Gini	0.346	n.a.	100.581
			Annual		0.344		
			Current	Square coef. of variation	0.245	n.a.	101.240
			Annual		0.242		
		1994	Current	Gini	0.355	n.a.	101.719
			Annual		0.349		
			Current	Square coef. of variation	0.277	n.a.	109.486
			Annual		0.253		
		1997	Current	Gini	0.355	n.a.	102.305
			Annual		0.347		
			Current	Square coef. of variation	0.330	n.a.	125.475
			Annual		0.263		
			Current	Prop. persons <0.5 x av. inc.	0.23	n.a.	104.545
			Annual		0.22		
Gibson et al. (2001)	CN	1992	Monthly	Theil	0.1015	n.a.	168.885
			Annual		0.0601		
			Monthly	Gini	0.2325	n.a.	123.146
			Annual		0.1888		
Finkel et al.	IL	1979/80	Monthly	Gini	0.3539	n.a.	107.699

(2006)			Annual		0.3286		
Cantó et al. (2006)	SP	1985-1995	Quarterly	Headcount ratio	0.17237	n.a.	107.516
			Annual		0.16032		
			Quarterly	Gini	0.311	n.a.	105.424
			Annual		0.295		
			Quarterly	Square coef. of variation	0.225	n.a.	125.000
			Annual		0.180		
			Quarterly	Theil	0.169	n.a.	114.966
			Annual		0.147		
Detlefsen (2012)	G	2004	Monthly	Gini	0.237	n.a.	101.923
			Annual		0.232		
			Monthly	Theil	0.114	n.a.	110.479
			Annual		0.103		

Note. Excerpts from the cited articles. Gibson et al.: Table 1. Cantó et al. (2006): Table 1. Finkel et al. (2006): Weighted averages of monthly Gini indices from Table XVI (own calculation) and annual index. Böheim and Jenkins (2006): Tables 3. Nolan (1987) and Ruggles (1990): taken from Böheim and Jenkins (2000), Table 3. Detlefsen (2012): Results for age cohort 1965-1974 in year 2004.

Table 2. Breakdown of the sample

			Annual gross earnings					Average number of months in a particular year in		
Year	Number of observations	Average age	Mean	Stand. dev.	Growth rate in %	New/Old states income ratio in %	Sample share resident in New states	unemployment	marginal employment	full employment
1991	15,657	39.930	20,709.857	(10,782.966)	---	45.990	17.162	0.336	0.000	11.664
1992	15,539	39.790	22,558.842	(11,478.145)	8.9	53.811	15.773	0.438	0.000	11.562
1993	15,631	39.667	23,786.293	(12,005.983)	5.4	58.564	15.405	0.499	0.000	11.501
1994	15,589	39.607	24,387.496	(12,574.777)	2.5	59.217	15.428	0.517	0.000	11.483
1995	15,550	39.539	25,440.973	(12,841.202)	4.3	61.902	15.395	0.475	0.000	11.525
1996	15,650	39.578	25,972.152	(13,220.954)	2.1	60.649	15.118	0.540	0.000	11.460
1997	15,689	39.590	26,210.473	(13,613.897)	0.9	61.145	14.730	0.569	0.000	11.431
1998	16,122	39.612	26,539.619	(14,002.099)	1.3	59.715	14.490	0.535	0.000	11.465
1999	16,470	39.666	27,155.184	(14,161.703)	2.3	61.026	13.922	0.529	0.013	11.457
2000	17,054	39.643	27,362.438	(14,530.919)	0.8	61.540	13.387	0.485	0.069	11.446
2001	17,400	39.629	28,184.289	(14,748.387)	3.0	62.308	12.966	0.486	0.066	11.449
2002	17,513	39.624	28,686.115	(15,002.573)	1.8	62.857	12.202	0.521	0.054	11.425
2003	17,626	39.643	29,506.354	(16,225.595)	2.9	62.727	11.806	0.546	0.059	11.395
2004	17,571	39.675	29,748.332	(18,292.924)	0.8	62.377	11.690	0.546	0.063	11.391
2005	17,972	39.666	29,552.980	(17,298.527)	-0.7	68.432	10.461	0.491	0.075	11.434
2006	18,034	39.641	29,869.971	(17,671.934)	1.1	69.120	10.247	0.413	0.087	11.500

Note. Database is IAS 2006

Table 3. Estimates for 2006

		Annual estimate			Q/A			M/A		
Region	Index	lb	point	ub	lb	point	ub	lb	point	ub
Old and New	Gini	0.305	0.309	0.312	1.011	1.011	1.012	1.014	1.016	1.017
	Theil	0.154	0.158	0.161	1.063	1.068	1.072	1.088	1.093	1.098
	Coef. of. var.	0.537	0.543	0.549	1.011	1.012	1.013	1.016	1.017	1.019
	Head count ratio	17.515	18.028	18.566	0.972	0.983	0.992	0.963	0.974	0.984
	Poverty exit rate	14.526	16.108	17.619	1.047	1.102	1.168	1.046	1.105	1.171
	Prais	0.180	0.191	0.198	1.020	1.046	1.076	1.023	1.047	1.081
	Atkinson	0.011	0.013	0.015	1.111	1.218	1.337	1.151	1.267	1.398
Old states	Gini	0.297	0.300	0.304	1.018	1.020	1.022	1.024	1.027	1.029
	Theil	0.147	0.150	0.154	1.080	1.086	1.092	1.110	1.117	1.125
	Coef. of. var.	0.521	0.527	0.533	1.019	1.021	1.023	1.026	1.029	1.031
	Head count ratio	16.997	17.574	18.163	0.994	1.004	1.015	0.992	1.003	1.015
	Poverty exit rate	13.066	14.449	16.411	1.007	1.087	1.141	1.018	1.095	1.164
	Prais	0.177	0.186	0.194	1.026	1.045	1.080	1.029	1.050	1.085
	Atkinson	0.012	0.014	0.016	1.048	1.131	1.260	1.084	1.177	1.307
New states	Gini	0.265	0.275	0.285	1.065	1.077	1.092	1.088	1.103	1.120
	Theil	0.115	0.124	0.133	1.182	1.216	1.250	1.261	1.302	1.346
	Coef. of. var.	0.483	0.501	0.519	1.064	1.076	1.089	1.087	1.101	1.117
	Head count ratio	8.898	10.327	11.761	1.031	1.098	1.189	1.063	1.142	1.240
	Poverty exit rate	16.813	22.874	32.212	0.867	1.137	1.357	0.866	1.143	1.387
	Prais	0.197	0.217	0.253	0.938	1.044	1.142	0.922	1.033	1.132
	Atkinson	0.009	0.017	0.024	1.310	1.762	2.702	1.318	1.827	2.812

Note. Database is IAS 2006. “lb” (“ub”) denotes the lower (upper) bound of the 95% confidence interval, while “point” gives the point estimate. The two-period indices are derived for years 2005 and 2006. “Q/A” (“M/A”) is the ratio of the average of the quarterly (monthly) indices and the annual index.

APPENDICES

Appendix A – Distributional measures

A.1 Inequality

Let $n = 1,...,N$ denote the individuals, and let y_n denote the non-negative earnings of n. Accordingly, average earnings is, $\bar{y} = \frac{1}{N}\sum_{n=1}^{N} y_n$, and the earnings share of n is, $s_n = \frac{y_n}{N\bar{y}}$.

The Gini index, I^G, the Theil index, I^T, and the coefficient of variation, I^V, are defined as follows:

$$I^G = \frac{1}{2N^2\bar{y}}\sum_{n=1}^{N}\sum_{m=1}^{N}\left|y_n - y_m\right|$$

$$I^T = \sum_{n=1}^{N} s_n \log\left(Ns_n\right)$$

$$I^V = \frac{1}{\bar{y}}\sqrt{\frac{1}{N}\sum_{n=1}^{N}\left[y_n - \bar{y}\right]^2}$$

A.2 Poverty

The *head count ratio* is the fraction of the population living below the poverty line.

The *poverty exit rate* is the fraction of the population classified as poor in a particular period and as non-poor in the subsequent period.

In the present analysis, the poverty line is defined as half of the median of gross individual earnings. For the quarterly (monthly) distributions, poverty lines are computed for each separate quarter (month). When results are decomposed by region of residence (Old vs. New states), poverty lines have been computed from the region-specific earnings distributions.

A.3 Mobility

Both our mobility indices, M^m, are based on the concept of the transition matrix, $P = \lfloor p_{jk} \rfloor$ where p_{jk} denotes the probability of the transition $j \to k$. The transition matrix thus gives the transition probabilities between earnings classes.

Atkinson mobility index

The immobility index, $M^{IR}(P)$, is "the percentage of people staying in the same earnings class or … in the same band given by the diagonal of the transition matrix and the adjacent elements" (Atkinson et al. (1992), p. 31). The mobility index, $M^{R}(P)$, which is used in the present analysis is:

$M^{R}(P) = 1 - M^{IR}(P)$.

Atkinson's mobility index thus gives the fraction of the population which does not remain close to the diagonal. An example is provided in (Atkinson et al. (1992), p. 31f.).

Prais index

The Prais-index (Prais, 1955) gives the mean exit time (MET) from an earnings class, $M^{MET}(P) = \frac{C - \sum_{c=1}^{C} p_{cc}}{C-1}$, where $c = 1,...,C$ denotes the earnings classes.

For computing the mobility indices, the earnings distribution has been subdivided into quintiles.

Annual mobility indices are derived from the distributions of annual earnings of two consecutive years, say 2005 and 2006. The mobility index for a particular month $m = 1,...,12$ is derived from the distributions of monthly earnings in the same month m of two consecutive years, say November 2005 and November 2006. To compute the average mobility index from the monthly distributions, the monthly indices from January to December are averaged. For the quarterly indices, the same logic applies.

Appendix B – Supplementary official statistics

B.1 Assessment ceilings

Employees in Germany contribute a particular fraction of their gross earnings to the mandatory pension system up to an assessment ceiling. The assessment ceiling differs between the Old and New states (see § 228a, section 1, sentence 1, no. 2 of the German Social Security code book VI in combination with Attachment 2a of the German Social Security code book VI). Assessment ceilings are adjusted every year, and the respective levels can be taken from Table B1.

Table B1. Assessment ceiling

Year	Old states	New states
1990	3,221	1,380
1991[a]	3,323	1,534
1991[b]	3,323	1,738
1992	3,477	2,454
1993	3,681	2,710
1994	3,886	3,017
1995	3,988	3,272
1996	4,090	3,477
1997	4,193	3,630
1998	4,295	3,579
1999	4,346	3,681
2000	4,397	3,630
2001	4,448	3,732
2002	4,500	3,750
2003[c]	5,100	3,750
2003[d]	5,100	4,250
2004	5,150	4,350
2005	5,200	4,400
2006	5,250	4,400

Note. All amounts in EUR per month. [a]: until June 30; [b]: since July 1; [c]: until March 31; [d]: since April 1. Data from German Pension Insurance.

B.2 Unemployment and short-term employment in year 2006

Table B.2 gives the official month-specific unemployment rates and numbers of short-term employees in year 2006, also decomposed by New and Old states.

Table B2. Unemployment and short-term employment

	Germany		Old states		New states	
	Unemployment rate in %	Number of short-term employees	Unemployment rate in %	Number of short-term employees	Unemployment rate in %	Number of short-term employees
January	12.1	96,113	10.2	79,009	19.2	17,104
February	12.2	100,742	10.2	81,499	19.5	19,243
March	12.0	104,829	10.1	83,083	19.3	21,746
April	11.5	83,259	9.7	66,620	18.5	16,639
May	10.9	72,048	9.2	58,418	17.4	13,630
June	10.5	61,528	8.9	50,111	16.8	11,417
July	10.5	53,932	8.9	42,939	16.7	10,993
August	10.5	47,935	8.8	38,484	16.7	9,451
September	10.1	45,979	8.5	37,542	16.4	8,437
October	9.8	38,833	8.2	32,278	15.8	6,555
November	9.6	35,519	8.0	29,596	15.5	5,923
December	9.6	63,049	8.0	49,503	15.7	13,546

Note. Data from Federal Employment Agency. New states include Berlin.

Table C1. Inequality estimates for period 1991-2006, Germany

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1991		0.271	0.275	0.278	0.277	0.280	0.284	0.278	0.282	0.286
1992		0.261	0.264	0.267	0.265	0.269	0.272	0.267	0.270	0.274
1993		0.259	0.262	0.265	0.263	0.267	0.270	0.265	0.268	0.272
1994		0.262	0.265	0.269	0.266	0.270	0.274	0.268	0.271	0.276
1995		0.257	0.261	0.264	0.261	0.265	0.268	0.263	0.266	0.270
1996		0.261	0.264	0.267	0.265	0.268	0.272	0.266	0.270	0.274
1997		0.265	0.268	0.271	0.269	0.273	0.277	0.271	0.275	0.279
1998		0.267	0.270	0.273	0.271	0.275	0.278	0.273	0.276	0.280
1999	Gini	0.267	0.270	0.273	0.271	0.275	0.278	0.273	0.276	0.280
2000		0.270	0.273	0.276	0.274	0.277	0.281	0.275	0.279	0.282
2001		0.270	0.273	0.276	0.274	0.278	0.281	0.276	0.279	0.283
2002		0.271	0.274	0.277	0.275	0.279	0.282	0.277	0.280	0.284
2003		0.287	0.290	0.293	0.292	0.295	0.299	0.293	0.297	0.301
2004		0.293	0.296	0.300	0.297	0.301	0.305	0.299	0.302	0.306
2005		0.301	0.304	0.308	0.305	0.309	0.312	0.306	0.310	0.314
2006		0.305	0.309	0.312	0.309	0.312	0.316	0.310	0.314	0.317
1991		0.119	0.122	0.125	0.129	0.133	0.137	0.133	0.137	0.141
1992		0.112	0.114	0.117	0.123	0.127	0.130	0.127	0.131	0.135
1993		0.111	0.113	0.116	0.123	0.126	0.130	0.127	0.131	0.135
1994		0.114	0.117	0.120	0.126	0.130	0.134	0.130	0.134	0.139
1995		0.109	0.112	0.114	0.120	0.123	0.127	0.124	0.128	0.132
1996		0.113	0.115	0.118	0.124	0.128	0.132	0.129	0.134	0.138
1997		0.117	0.119	0.122	0.129	0.133	0.137	0.134	0.139	0.143
1998		0.118	0.120	0.123	0.130	0.134	0.137	0.135	0.139	0.143
1999	Theil	0.118	0.120	0.123	0.130	0.134	0.138	0.135	0.139	0.143
2000		0.120	0.123	0.125	0.132	0.136	0.140	0.137	0.141	0.145
2001		0.120	0.123	0.126	0.133	0.136	0.140	0.138	0.142	0.146
2002		0.121	0.124	0.127	0.134	0.138	0.142	0.139	0.144	0.148
2003		0.136	0.139	0.142	0.149	0.153	0.158	0.154	0.159	0.163
2004		0.142	0.145	0.148	0.155	0.159	0.164	0.160	0.165	0.170
2005		0.150	0.154	0.157	0.162	0.166	0.170	0.166	0.171	0.175
2006		0.154	0.158	0.161	0.164	0.168	0.173	0.168	0.172	0.177
1991		0.473	0.479	0.484	0.483	0.489	0.496	0.486	0.492	0.498
1992		0.454	0.460	0.464	0.463	0.470	0.475	0.467	0.473	0.479
1993		0.452	0.458	0.463	0.462	0.467	0.474	0.465	0.471	0.477
1994		0.459	0.464	0.470	0.468	0.474	0.481	0.471	0.477	0.484
1995		0.450	0.456	0.461	0.458	0.465	0.471	0.462	0.468	0.474
1996		0.456	0.462	0.467	0.465	0.471	0.478	0.469	0.475	0.482
1997		0.465	0.470	0.476	0.474	0.480	0.486	0.477	0.484	0.490
1998		0.468	0.474	0.479	0.477	0.483	0.489	0.480	0.487	0.493
1999	Coeff. of	0.468	0.473	0.478	0.477	0.483	0.489	0.481	0.487	0.493
2000	variation	0.472	0.477	0.482	0.481	0.487	0.492	0.484	0.490	0.496
2001		0.472	0.477	0.482	0.481	0.487	0.493	0.485	0.491	0.497
2002		0.473	0.479	0.484	0.483	0.489	0.495	0.486	0.493	0.499
2003		0.506	0.512	0.518	0.516	0.522	0.529	0.520	0.526	0.533
2004		0.517	0.523	0.529	0.527	0.534	0.543	0.534	0.545	0.558
2005		0.531	0.536	0.542	0.538	0.544	0.551	0.541	0.548	0.555
2006		0.537	0.543	0.549	0.543	0.550	0.556	0.546	0.552	0.559

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C2. Poverty estimates for period 1991-2006, Germany

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1991		16.905	17.489	18.117	16.775	17.625	18.494	16.753	17.611	18.496
1992		15.080	15.637	16.203	14.632	15.376	16.130	14.585	15.352	16.110
1993		14.791	15.344	15.897	14.246	14.957	15.746	14.091	14.801	15.597
1994		14.796	15.376	16.004	14.243	15.011	15.826	14.053	14.815	15.628
1995		14.302	14.856	15.440	13.707	14.449	15.223	13.516	14.240	15.035
1996		14.627	15.195	15.713	13.984	14.720	15.496	13.724	14.460	15.243
1997		14.455	14.980	15.547	14.087	14.792	15.555	13.789	14.487	15.248
1998		14.940	15.463	16.024	14.171	14.844	15.591	13.853	14.532	15.273
1999	Head	14.760	15.300	15.821	14.135	14.859	15.560	13.891	14.600	15.324
2000	count ratio	15.137	15.643	16.196	14.394	15.091	15.848	14.128	14.818	15.584
2001		14.745	15.270	15.792	14.197	14.903	15.619	13.960	14.670	15.382
2002		15.225	15.773	16.289	14.674	15.398	16.107	14.463	15.219	15.918
2003		15.844	16.372	16.919	15.483	16.222	16.949	15.231	15.971	16.703
2004		16.403	16.926	17.491	15.907	16.633	17.385	15.675	16.418	17.179
2005		16.999	17.528	18.056	16.676	17.402	18.116	16.479	17.204	17.938
2006		17.515	18.028	18.566	17.025	17.715	18.423	16.863	17.557	18.261
1990/1		---	---	---	---	---	---	---	---	---
1991/2		26.392	28.507	30.786	28.103	31.562	35.672	28.178	31.779	35.802
1992/3		19.377	21.416	23.382	20.423	23.714	27.525	20.916	24.397	28.401
1993/4		18.437	20.302	22.471	19.454	22.853	26.603	19.568	22.987	26.907
1994/5		19.539	21.501	23.537	20.138	23.426	27.178	20.455	23.935	27.762
1995/6		15.926	17.607	19.932	17.674	21.208	25.335	18.133	21.788	26.182
1996/7		15.999	17.892	20.115	17.026	20.523	24.544	17.716	21.611	25.813
1997/8		17.595	19.783	21.627	19.285	22.736	26.912	19.541	23.072	27.450
1998/9	Poverty	18.829	20.877	23.066	19.953	23.342	27.488	19.887	23.368	27.561
1999/0	exit rate	19.477	21.512	23.494	20.515	24.070	27.832	20.720	24.342	28.231
2000/1		20.088	22.020	23.932	20.809	23.800	27.392	20.817	23.968	27.674
2001/2		17.234	19.144	21.030	18.980	22.480	26.268	19.172	22.719	26.700
2002/3		14.231	15.910	17.869	15.548	18.710	22.631	15.858	19.141	23.243
2003/4		15.117	17.113	18.570	15.445	18.447	21.565	15.822	18.945	22.244
2004/5		15.719	17.310	19.132	16.270	18.885	22.277	16.334	19.125	22.570
2005/6		14.526	16.108	17.619	15.210	17.745	20.580	15.200	17.799	20.632

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C3. Mobility estimates for period 1991-2006, Germany

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.312	0.325	0.335	0.319	0.339	0.357	0.319	0.338	0.357
1992/3		0.237	0.248	0.257	0.240	0.256	0.272	0.239	0.255	0.272
1993/4		0.221	0.231	0.239	0.221	0.236	0.252	0.218	0.233	0.250
1994/5		0.210	0.219	0.229	0.215	0.233	0.248	0.213	0.230	0.245
1995/6		0.210	0.220	0.229	0.209	0.224	0.241	0.207	0.222	0.238
1996/7		0.195	0.203	0.213	0.196	0.211	0.226	0.195	0.208	0.225
1997/8		0.203	0.213	0.221	0.204	0.219	0.234	0.202	0.217	0.232
1998/9	Prais	0.218	0.228	0.236	0.218	0.232	0.248	0.217	0.231	0.247
1999/0		0.212	0.220	0.230	0.218	0.233	0.249	0.217	0.233	0.249
2000/1		0.211	0.221	0.229	0.218	0.232	0.248	0.217	0.232	0.248
2001/2		0.210	0.218	0.228	0.217	0.231	0.248	0.217	0.232	0.248
2002/3		0.197	0.203	0.214	0.205	0.219	0.235	0.205	0.219	0.236
2003/4		0.187	0.196	0.205	0.194	0.208	0.225	0.193	0.208	0.225
2004/5		0.189	0.196	0.205	0.192	0.205	0.220	0.191	0.205	0.220
2005/6		0.180	0.191	0.198	0.184	0.200	0.213	0.184	0.200	0.214
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.022	0.025	0.028	0.029	0.036	0.044	0.030	0.037	0.046
1992/3		0.018	0.021	0.023	0.020	0.024	0.030	0.021	0.026	0.032
1993/4		0.017	0.019	0.022	0.018	0.023	0.028	0.019	0.024	0.030
1994/5		0.015	0.018	0.020	0.016	0.020	0.025	0.017	0.022	0.027
1995/6		0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.023	0.029
1996/7		0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.022	0.028
1997/8		0.014	0.017	0.019	0.017	0.021	0.027	0.018	0.022	0.028
1998/9	Atkinson	0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.023	0.028
1999/0		0.017	0.019	0.021	0.019	0.023	0.028	0.019	0.024	0.029
2000/1		0.017	0.020	0.022	0.019	0.024	0.029	0.019	0.024	0.030
2001/2		0.017	0.020	0.022	0.020	0.025	0.031	0.021	0.026	0.032
2002/3		0.017	0.020	0.022	0.019	0.023	0.028	0.019	0.024	0.029
2003/4		0.015	0.017	0.019	0.017	0.021	0.026	0.017	0.021	0.027
2004/5		0.014	0.017	0.019	0.016	0.020	0.024	0.017	0.021	0.025
2005/6		0.011	0.013	0.015	0.012	0.016	0.020	0.013	0.017	0.021

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C4a. Inequality estimates for period 1991-2006, Old states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	Ub
1991		0.234	0.237	0.240	0.240	0.243	0.247	0.241	0.245	0.249
1992		0.236	0.239	0.242	0.240	0.244	0.248	0.242	0.246	0.250
1993		0.239	0.243	0.246	0.244	0.248	0.252	0.245	0.250	0.254
1994		0.244	0.247	0.251	0.249	0.253	0.257	0.250	0.254	0.259
1995		0.240	0.244	0.247	0.245	0.249	0.253	0.246	0.250	0.254
1996		0.243	0.246	0.249	0.247	0.251	0.255	0.249	0.253	0.257
1997		0.247	0.251	0.254	0.252	0.256	0.260	0.253	0.258	0.262
1998		0.249	0.252	0.256	0.253	0.257	0.261	0.255	0.259	0.263
1999	Gini	0.250	0.253	0.256	0.255	0.258	0.262	0.256	0.260	0.264
2000		0.254	0.257	0.260	0.258	0.262	0.266	0.260	0.263	0.267
2001		0.253	0.257	0.260	0.259	0.262	0.266	0.260	0.264	0.268
2002		0.256	0.260	0.263	0.262	0.265	0.269	0.263	0.267	0.271
2003		0.274	0.277	0.280	0.279	0.283	0.287	0.281	0.285	0.289
2004		0.280	0.283	0.287	0.285	0.289	0.293	0.286	0.291	0.295
2005		0.290	0.294	0.297	0.297	0.301	0.306	0.299	0.304	0.308
2006		0.297	0.300	0.304	0.302	0.306	0.310	0.304	0.308	0.313
1991		0.091	0.094	0.096	0.100	0.104	0.107	0.103	0.107	0.111
1992		0.094	0.097	0.099	0.104	0.108	0.112	0.107	0.111	0.116
1993		0.097	0.100	0.103	0.107	0.111	0.115	0.111	0.115	0.119
1994		0.100	0.103	0.106	0.111	0.115	0.119	0.115	0.119	0.123
1995		0.097	0.099	0.102	0.106	0.110	0.114	0.110	0.114	0.118
1996		0.099	0.102	0.105	0.109	0.113	0.117	0.113	0.117	0.122
1997		0.102	0.106	0.109	0.114	0.118	0.122	0.118	0.123	0.128
1998		0.103	0.106	0.109	0.114	0.118	0.122	0.118	0.122	0.126
1999	Theil	0.104	0.107	0.110	0.115	0.119	0.123	0.120	0.124	0.128
2000		0.108	0.110	0.113	0.119	0.122	0.126	0.123	0.126	0.131
2001		0.107	0.110	0.113	0.118	0.122	0.126	0.123	0.127	0.132
2002		0.110	0.113	0.116	0.122	0.126	0.130	0.127	0.131	0.136
2003		0.124	0.127	0.130	0.137	0.141	0.146	0.142	0.146	0.151
2004		0.130	0.133	0.136	0.142	0.147	0.152	0.148	0.153	0.158
2005		0.140	0.144	0.148	0.155	0.160	0.165	0.160	0.165	0.171
2006		0.147	0.150	0.154	0.158	0.163	0.168	0.163	0.168	0.173
1991		0.409	0.414	0.420	0.420	0.427	0.433	0.423	0.430	0.437
1992		0.412	0.417	0.423	0.422	0.428	0.435	0.425	0.432	0.439
1993		0.419	0.425	0.430	0.428	0.435	0.442	0.432	0.439	0.446
1994		0.428	0.433	0.439	0.437	0.444	0.451	0.441	0.448	0.455
1995		0.421	0.427	0.432	0.430	0.437	0.443	0.434	0.441	0.448
1996		0.425	0.431	0.437	0.435	0.441	0.448	0.439	0.445	0.452
1997		0.433	0.439	0.445	0.443	0.450	0.457	0.447	0.454	0.462
1998		0.437	0.442	0.448	0.446	0.452	0.459	0.449	0.456	0.463
1999	Coeff. of	0.438	0.443	0.449	0.448	0.454	0.461	0.452	0.458	0.465
2000	variation	0.444	0.449	0.455	0.453	0.459	0.466	0.457	0.463	0.470
2001		0.443	0.449	0.454	0.454	0.461	0.467	0.458	0.465	0.472
2002		0.448	0.454	0.459	0.459	0.465	0.472	0.463	0.470	0.477
2003		0.482	0.488	0.494	0.493	0.500	0.506	0.497	0.504	0.511
2004		0.493	0.499	0.505	0.505	0.513	0.521	0.513	0.525	0.537
2005		0.510	0.516	0.522	0.523	0.530	0.538	0.527	0.535	0.544
2006		0.521	0.527	0.533	0.531	0.538	0.545	0.534	0.542	0.549

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C4b. Inequality estimates for period 1991-2006, New states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	Ub
1991		0.216	0.224	0.232	0.231	0.242	0.253	0.235	0.246	0.258
1992		0.223	0.231	0.238	0.238	0.250	0.261	0.242	0.255	0.267
1993		0.229	0.238	0.246	0.244	0.256	0.267	0.249	0.261	0.273
1994		0.242	0.250	0.260	0.254	0.266	0.278	0.258	0.271	0.284
1995		0.243	0.252	0.261	0.254	0.265	0.276	0.258	0.269	0.281
1996		0.257	0.266	0.274	0.271	0.283	0.295	0.275	0.288	0.300
1997		0.261	0.272	0.281	0.275	0.288	0.301	0.280	0.294	0.307
1998		0.268	0.278	0.288	0.283	0.296	0.308	0.288	0.302	0.315
1999	Gini	0.268	0.277	0.286	0.282	0.295	0.306	0.287	0.300	0.313
2000		0.267	0.276	0.286	0.283	0.296	0.310	0.289	0.302	0.317
2001		0.273	0.282	0.292	0.290	0.302	0.316	0.295	0.309	0.323
2002		0.268	0.278	0.287	0.285	0.299	0.312	0.291	0.306	0.320
2003		0.283	0.294	0.304	0.300	0.315	0.330	0.306	0.322	0.338
2004		0.287	0.298	0.308	0.305	0.320	0.335	0.312	0.328	0.344
2005		0.263	0.273	0.284	0.281	0.296	0.311	0.288	0.305	0.321
2006		0.265	0.275	0.285	0.282	0.297	0.312	0.288	0.304	0.320
1991		0.080	0.086	0.092	0.104	0.115	0.127	0.110	0.123	0.136
1992		0.086	0.092	0.098	0.114	0.126	0.139	0.123	0.137	0.152
1993		0.090	0.097	0.104	0.119	0.131	0.145	0.130	0.144	0.159
1994		0.101	0.108	0.116	0.128	0.141	0.155	0.138	0.153	0.168
1995		0.101	0.108	0.116	0.124	0.136	0.148	0.133	0.147	0.161
1996		0.112	0.120	0.128	0.142	0.156	0.170	0.154	0.170	0.186
1997		0.117	0.126	0.134	0.145	0.159	0.174	0.158	0.175	0.192
1998		0.121	0.130	0.139	0.151	0.166	0.181	0.165	0.182	0.200
1999	Theil	0.120	0.128	0.136	0.153	0.167	0.182	0.166	0.181	0.198
2000		0.119	0.128	0.137	0.150	0.165	0.181	0.164	0.180	0.199
2001		0.125	0.134	0.142	0.158	0.172	0.187	0.171	0.187	0.205
2002		0.121	0.129	0.138	0.152	0.167	0.184	0.165	0.183	0.203
2003		0.135	0.145	0.155	0.168	0.185	0.203	0.181	0.200	0.221
2004		0.138	0.148	0.158	0.170	0.188	0.206	0.184	0.204	0.225
2005		0.114	0.123	0.132	0.138	0.154	0.170	0.149	0.167	0.185
2006		0.115	0.124	0.133	0.136	0.151	0.167	0.146	0.162	0.179
1991		0.392	0.405	0.418	0.423	0.442	0.461	0.430	0.451	0.472
1992		0.401	0.414	0.427	0.433	0.453	0.474	0.443	0.464	0.486
1993		0.411	0.425	0.438	0.442	0.462	0.481	0.453	0.474	0.495
1994		0.432	0.447	0.463	0.459	0.480	0.501	0.468	0.490	0.513
1995		0.436	0.451	0.465	0.458	0.478	0.497	0.467	0.488	0.508
1996		0.459	0.475	0.490	0.487	0.508	0.529	0.497	0.519	0.541
1997		0.469	0.486	0.504	0.495	0.518	0.541	0.506	0.530	0.555
1998		0.482	0.499	0.516	0.510	0.532	0.555	0.521	0.545	0.569
1999	Coeff. of	0.480	0.496	0.512	0.509	0.530	0.552	0.519	0.542	0.565
2000	variation	0.480	0.496	0.513	0.511	0.533	0.557	0.522	0.546	0.571
2001		0.491	0.506	0.523	0.523	0.544	0.568	0.535	0.558	0.583
2002		0.481	0.497	0.514	0.514	0.537	0.562	0.526	0.551	0.577
2003		0.510	0.530	0.547	0.543	0.569	0.594	0.554	0.582	0.609
2004		0.518	0.537	0.555	0.551	0.576	0.603	0.563	0.590	0.618
2005		0.479	0.497	0.515	0.513	0.538	0.564	0.526	0.553	0.582
2006		0.483	0.501	0.519	0.514	0.539	0.566	0.525	0.552	0.580

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C5a. Poverty estimates for period 1991-2006, Old states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1991		12.854	13.407	13.999	12.776	13.532	14.376	12.758	13.518	14.361
1992		13.835	14.433	15.013	13.545	14.359	15.157	13.533	14.385	15.165
1993		13.975	14.629	15.169	13.719	14.511	15.306	13.695	14.483	15.285
1994		14.159	14.681	15.313	13.895	14.657	15.437	13.783	14.538	15.343
1995		13.561	14.173	14.696	13.286	14.030	14.792	13.198	13.939	14.689
1996		13.305	13.870	14.449	13.114	13.899	14.697	12.994	13.804	14.597
1997		13.310	13.928	14.480	13.137	13.907	14.693	12.993	13.782	14.569
1998		13.368	13.952	14.499	12.966	13.720	14.483	12.775	13.526	14.309
1999	Head	13.275	13.874	14.447	12.920	13.686	14.457	12.789	13.555	14.330
2000	count ratio	14.054	14.562	15.163	13.486	14.168	14.940	13.369	14.052	14.828
2001		13.535	14.069	14.626	13.327	14.085	14.811	13.211	14.016	14.741
2002		14.458	14.991	15.524	14.017	14.716	15.462	13.893	14.613	15.367
2003		14.932	15.465	15.987	14.688	15.406	16.110	14.544	15.286	15.979
2004		15.347	15.887	16.437	15.142	15.857	16.596	15.028	15.745	16.500
2005		16.203	16.768	17.382	16.335	17.096	17.954	16.286	17.095	17.941
2006		16.997	17.574	18.163	16.896	17.652	18.437	16.865	17.627	18.443
1990/1		---	---	---	---	---	---	---	---	---
1991/2		16.112	18.027	20.358	17.400	20.906	25.283	17.382	20.955	25.322
1992/3		13.941	15.996	17.949	14.019	17.284	20.812	14.431	17.835	21.619
1993/4		14.211	16.478	18.464	14.979	18.651	22.398	15.249	19.084	23.019
1994/5		16.689	18.965	21.083	16.997	20.512	24.207	16.972	20.499	24.353
1995/6		14.666	16.596	18.897	15.409	18.524	22.539	15.715	18.994	23.149
1996/7		14.189	16.467	18.815	15.231	18.887	23.244	15.839	19.710	24.365
1997/8		18.044	20.327	22.263	19.269	22.884	26.755	19.503	23.273	27.319
1998/9	Poverty	17.921	20.412	22.316	19.020	22.802	27.112	18.863	22.607	26.907
1999/0	exit rate	18.389	20.471	22.605	19.791	23.484	27.447	20.222	23.979	28.008
2000/1		19.791	21.631	23.966	20.114	23.407	27.224	20.176	23.543	27.416
2001/2		16.209	18.280	20.336	17.722	21.323	25.392	17.902	21.599	25.843
2002/3		13.884	15.788	17.727	14.909	18.162	21.949	15.242	18.640	22.670
2003/4		13.559	15.534	17.331	14.163	17.431	21.270	14.527	17.895	21.887
2004/5		14.961	16.949	18.736	15.243	18.380	21.752	15.102	18.200	21.673
2005/6		13.066	14.449	16.411	13.160	15.701	18.727	13.306	15.815	19.101

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C5b. Poverty estimates for period 1991-2006, New states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1991		8.450	9.652	10.703	8.040	9.747	11.584	8.077	9.809	11.647
1992		9.266	10.208	11.557	9.326	11.282	13.453	9.318	11.273	13.464
1993		10.077	11.315	12.565	10.019	11.866	13.895	10.034	11.900	14.008
1994		11.810	13.087	14.471	10.895	12.680	14.749	10.769	12.572	14.666
1995		11.176	12.485	13.947	10.313	12.172	14.253	10.181	12.045	14.116
1996		12.378	13.643	15.080	12.284	14.292	16.706	12.093	14.171	16.528
1997		13.455	14.799	16.344	12.642	14.698	16.928	12.367	14.420	16.693
1998		13.518	14.807	16.200	12.508	14.555	16.689	12.285	14.290	16.460
1999	Head	13.374	14.837	16.345	12.228	14.334	16.750	12.023	14.178	16.682
2000	count ratio	11.495	12.858	14.238	11.594	13.879	16.414	11.442	13.766	16.357
2001		12.732	14.168	15.573	12.423	14.543	16.966	12.101	14.200	16.636
2002		12.052	13.443	14.870	11.981	14.020	16.477	11.899	14.007	16.588
2003		12.736	14.331	15.703	12.752	14.948	17.459	12.800	15.008	17.613
2004		13.112	14.659	16.049	13.103	15.285	17.831	12.953	15.252	17.910
2005		9.396	10.798	12.156	9.716	11.854	14.411	10.105	12.394	15.169
2006		8.898	10.327	11.761	9.173	11.339	13.979	9.458	11.792	14.580
1990/1		---	---	---	---	---	---	---	---	---
1991/2		34.260	43.043	52.012	37.955	54.404	77.555	39.581	56.551	80.197
1992/3		36.746	45.075	52.731	35.250	48.671	65.784	35.525	49.314	67.272
1993/4		33.359	40.258	47.732	35.509	48.100	65.361	36.181	49.233	67.204
1994/5		36.104	42.387	49.353	35.121	45.556	58.919	36.431	47.085	61.492
1995/6		31.876	38.219	46.228	31.295	42.368	57.672	32.766	44.763	61.177
1996/7		23.742	29.758	35.821	26.493	38.727	55.068	28.286	41.142	58.481
1997/8		29.244	35.628	42.996	30.543	42.404	59.386	32.266	45.291	63.432
1998/9	Poverty	26.952	32.979	38.918	31.916	44.528	61.725	33.811	47.160	65.820
1999/0	exit rate	31.347	38.742	45.852	31.270	43.323	58.128	32.512	44.961	61.092
2000/1		22.049	29.470	35.915	21.668	32.978	50.164	23.978	37.085	57.217
2001/2		24.597	31.960	38.313	24.285	35.376	51.390	24.853	36.900	54.043
2002/3		19.809	27.771	33.860	20.573	32.655	50.260	20.558	33.219	50.270
2003/4		20.551	26.964	33.180	20.800	31.756	47.715	21.388	33.007	49.484
2004/5		17.505	22.633	30.741	17.399	27.728	45.430	17.899	28.889	47.489
2005/6		16.813	22.874	32.212	14.572	26.008	43.723	14.560	26.149	44.685

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C6a. Mobility estimates for period 1991-2006, Old states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.312	0.325	0.335	0.319	0.339	0.357	0.319	0.338	0.357
1992/3		0.237	0.248	0.257	0.240	0.256	0.272	0.239	0.255	0.272
1993/4		0.221	0.231	0.239	0.221	0.236	0.252	0.218	0.233	0.250
1994/5		0.210	0.219	0.229	0.215	0.233	0.248	0.213	0.230	0.245
1995/6		0.210	0.220	0.229	0.209	0.224	0.241	0.207	0.222	0.238
1996/7		0.195	0.203	0.213	0.196	0.211	0.226	0.195	0.208	0.225
1997/8		0.203	0.213	0.221	0.204	0.219	0.234	0.202	0.217	0.232
1998/9	Prais	0.218	0.228	0.236	0.218	0.232	0.248	0.217	0.231	0.247
1999/0		0.212	0.220	0.230	0.218	0.233	0.249	0.217	0.233	0.249
2000/1		0.211	0.221	0.229	0.218	0.232	0.248	0.217	0.232	0.248
2001/2		0.210	0.218	0.228	0.217	0.231	0.248	0.217	0.232	0.248
2002/3		0.197	0.203	0.214	0.205	0.219	0.235	0.205	0.219	0.236
2003/4		0.187	0.196	0.205	0.194	0.208	0.225	0.193	0.208	0.225
2004/5		0.189	0.196	0.205	0.192	0.205	0.220	0.191	0.205	0.220
2005/6		0.180	0.191	0.198	0.184	0.200	0.213	0.184	0.200	0.214
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.022	0.025	0.028	0.029	0.036	0.044	0.030	0.037	0.046
1992/3		0.018	0.021	0.023	0.020	0.024	0.030	0.021	0.026	0.032
1993/4		0.017	0.019	0.022	0.018	0.023	0.028	0.019	0.024	0.030
1994/5		0.015	0.018	0.020	0.016	0.020	0.025	0.017	0.022	0.027
1995/6		0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.023	0.029
1996/7		0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.022	0.028
1997/8		0.014	0.017	0.019	0.017	0.021	0.027	0.018	0.022	0.028
1998/9	Atkinson	0.016	0.018	0.021	0.017	0.022	0.027	0.018	0.023	0.028
1999/0		0.017	0.019	0.021	0.019	0.023	0.028	0.019	0.024	0.029
2000/1		0.017	0.020	0.022	0.019	0.024	0.029	0.019	0.024	0.030
2001/2		0.017	0.020	0.022	0.020	0.025	0.031	0.021	0.026	0.032
2002/3		0.017	0.020	0.022	0.019	0.023	0.028	0.019	0.024	0.029
2003/4		0.015	0.017	0.019	0.017	0.021	0.026	0.017	0.021	0.027
2004/5		0.014	0.017	0.019	0.016	0.020	0.024	0.017	0.021	0.025
2005/6		0.011	0.013	0.015	0.012	0.016	0.020	0.013	0.017	0.021

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.

Table C6b. Mobility estimates for period 1991-2006, New states

		A			Q			M		
Period	Index	lb	point	ub	lb	point	ub	lb	point	ub
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.480	0.510	0.540	0.488	0.539	0.599	0.489	0.540	0.602
1992/3		0.380	0.414	0.444	0.374	0.425	0.490	0.373	0.428	0.491
1993/4		0.344	0.378	0.402	0.325	0.368	0.427	0.327	0.375	0.431
1994/5		0.304	0.341	0.369	0.300	0.348	0.414	0.301	0.349	0.419
1995/6		0.301	0.340	0.368	0.286	0.333	0.402	0.283	0.331	0.399
1996/7		0.272	0.302	0.341	0.267	0.318	0.388	0.264	0.319	0.390
1997/8		0.274	0.301	0.331	0.268	0.315	0.373	0.263	0.311	0.369
1998/9	Prais	0.270	0.295	0.327	0.276	0.326	0.388	0.273	0.326	0.389
1999/0		0.265	0.296	0.334	0.253	0.308	0.373	0.250	0.308	0.371
2000/1		0.228	0.259	0.295	0.216	0.265	0.333	0.215	0.265	0.336
2001/2		0.232	0.268	0.296	0.229	0.279	0.347	0.226	0.276	0.345
2002/3		0.235	0.264	0.301	0.232	0.283	0.353	0.231	0.281	0.355
2003/4		0.198	0.212	0.262	0.194	0.236	0.318	0.190	0.236	0.315
2004/5		0.210	0.245	0.275	0.193	0.235	0.303	0.188	0.233	0.301
2005/6		0.197	0.217	0.253	0.185	0.226	0.289	0.181	0.224	0.287
1990/1		---	---	---	---	---	---	---	---	---
1991/2		0.073	0.086	0.105	0.081	0.107	0.144	0.080	0.107	0.144
1992/3		0.047	0.061	0.072	0.048	0.071	0.099	0.048	0.070	0.100
1993/4		0.031	0.040	0.051	0.030	0.046	0.073	0.032	0.049	0.078
1994/5		0.030	0.040	0.050	0.026	0.041	0.061	0.028	0.042	0.065
1995/6		0.027	0.038	0.047	0.032	0.051	0.082	0.032	0.053	0.085
1996/7		0.033	0.043	0.053	0.032	0.048	0.076	0.032	0.049	0.075
1997/8		0.024	0.034	0.046	0.026	0.047	0.080	0.026	0.046	0.081
1998/9	Atkinson	0.028	0.036	0.048	0.032	0.051	0.083	0.032	0.052	0.083
1999/0		0.025	0.036	0.049	0.028	0.049	0.082	0.028	0.049	0.085
2000/1		0.026	0.036	0.046	0.029	0.049	0.078	0.029	0.050	0.081
2001/2		0.019	0.028	0.038	0.025	0.047	0.085	0.026	0.049	0.088
2002/3		0.022	0.031	0.040	0.026	0.046	0.078	0.026	0.048	0.081
2003/4		0.018	0.027	0.035	0.023	0.044	0.076	0.024	0.044	0.079
2004/5		0.026	0.037	0.051	0.023	0.042	0.071	0.024	0.044	0.074
2005/6		0.009	0.017	0.024	0.012	0.029	0.066	0.012	0.030	0.069

Note. Data is IAS 2006. “lb” (“ub”): lower (upper) bound of 95% bootstrap confidence interval. “A”: estimate from annual distribution; “Q” (“M”): average from quarterly (monthly) distributions.