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# **Life Satisfaction and Economic Conditions in East and West Germany Pre- and Post-Unification**

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## **Abstract**

Economic disruption in East Germany at the time of unification resulted in a noticeable drop in life satisfaction. By the late 1990s East Germany's life satisfaction had recovered to about its 1990 level, and its shortfall relative to West Germany was slightly less than that before unification. In West Germany life satisfaction was fairly constant before unification, but subsequently trended moderately downward, with Turkish life satisfaction declining noticeably relative to Germans. Changes in life satisfaction in East and West Germany both for Germans and foreigners are most closely associated with relative income variables, not absolute income.

**Keywords:** Life satisfaction, happiness, relative income, income satisfaction, transition economies

**JEL classification:** D31, D60, I31, O52, P3

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# **Life Satisfaction and Economic Conditions in East and West Germany**

## **Pre- and Post-Unification**

### **I. Introduction**

How have feelings of well-being changed in East and West Germany since unification, and how do they compare with the pre-unification situation? Do the trends differ for Germans and foreigners? To what extent are the changes in well-being associated with economic conditions? These are the questions that this article addresses.

The significance of these questions is obvious. We have here two large coterminous populations with a common language and history living for over four decades prior to October 1990 under strikingly different political and economic regimes. In a short span of time they were brought together in a common economic system under democratic rule, with one region transitioning from socialism to capitalism. What happened to life satisfaction in the two areas, and were Germans and foreigners differently affected? In regard to foreigners, the experience of the Turkish population is of special interest, because the non-German segment of the population of Germany is projected to grow steadily, and by 2050 to be close to one-quarter, of which over three-fourths would be non-Western, mostly Turkish (Coleman 2006, p. 414).

Our measure of well-being is satisfaction with life, the answer on a 0 to 10 integer scale to the following question: “How satisfied are you with your life, all things considered?” Until the last few decades, economists have typically inferred well-being from what are known as “objective” measures (GDP per capita, life expectancy,

educational attainment, and the like) with GDP per capita typically the featured measure.<sup>1</sup> Recently, however, increasing attention has been paid to measures of “subjective” well-being (SWB); responses to questions on personal happiness or general life satisfaction. This growing literature analyzes both substantive and methodological issues, including the reliability, validity, and comparability of the responses to such questions (Clark et al. 2008, DiTella and MacCulloch 2006, Frey and Stutzer 2002a and 2002b, Graham 2008, Layard 2005, van Praag and Ferrer-i-Carbonell 2004, van Praag and Frijters 1999, Veenhoven 1993). The consensus is that SWB measures of the type used here, though not without their shortcomings, are meaningful measures of well-being. Our interest here is substantive: what the life satisfaction measure tells us about the trends in well-being of various segments of Germany’s population in the course of unification.

We are interested also in the extent to which trends in life satisfaction are associated with economic conditions. Non-economic factors influence life satisfaction too, but our initial analysis of the data revealed that in Germany in the period under study, movements in life satisfaction have been most systematically related to economic variables, while the influence of non-economic factors has been much more idiosyncratic.

Our measures of economic conditions encompass three income variables as well as unemployment and inflation rates. We examine both absolute and relative income measures. In economics the usual view, based on revealed preference theory, is that it is improvements in absolute income that raise well-being. The new literature on subjective well-being has increasingly challenged this assumption. As the evidence has mounted that increasing real GDP per capita is not accompanied by rising subjective well-being,

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<sup>1</sup> Simon Kuznets’ insistence that GDP is a subjective, not objective, measure is conventionally ignored by economists (see the exchange between Kuznets 1948 and the National Income Division of the Department of Commerce).

the emphasis has shifted towards the importance of relative income (see, for example, the references above, Blanchflower and Oswald 2004, Easterlin 1974, 1995, and 2005, Stutzer 2004, and Easterlin 2001). The importance for life satisfaction of the unemployment and inflation rates is suggested by DiTella et al. (2001), who find in a multiple regression analysis of data for 12 European countries a significant negative association of each rate with life satisfaction.

We examine two measures of relative income. The first is a simple ratio of the income of any given population group to that of Germany as a whole, which we term simply “relative income”. The second is the mean response of a population group to a question on “satisfaction with income”.<sup>2</sup> The main analytical difference between the two is that the first measure implicitly takes as the reference point for evaluating absolute income the same standard for all population groups; thus West Germans, East Germans and foreigners are all assumed to be evaluating their absolute income by comparison with the national average. This assumption seems something of a stretch especially for foreigners whose standards may reflect in part those of the home country. In contrast, responses on satisfaction with income allow for systematic differences in the reference points of different population groups and thus provide a better calibrated relative income measure. West Germans, East Germans, and foreigners all with the same absolute income (and thus the same relative income based on the national average) might report different levels of income satisfaction because of differences in the reference point of each group. It is also reasonable to suppose that satisfaction with income may be influenced by

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<sup>2</sup> A newly published paper by D’Ambrosio and Frick (2007), using pooled individual data for 1990-2004 from the same data source as here, also views income satisfaction as a relative income (“income deprivation”) measure and provides supporting evidence.

unemployment and inflation because of the uncertainty created by changes in these conditions.

Very little has been written on trends in life satisfaction in Germany. One exception is an econometric analysis by Frijters et al. (2004a) of life satisfaction in East Germany 1991-2001 that uses the same data source as the present study (cf. also Frijters et al., 2004b). This study is of special interest because the main conclusion of their analysis runs counter to much of the literature on subjective well-being. The conclusion, that absolute income drives life satisfaction, is featured in their title: *Money Does Matter! Evidence from Increasing Real Income and Life Satisfaction in East Germany following Reunification*. As will be seen, our findings, which apply to West as well as East Germany and include the pre- as well as post-unification period, conform more to the usual conclusion, namely that relative income variables are more closely linked to life satisfaction than absolute income.

## II. Data and Methods

The data are those of the Socio-Economic Panel (SOEP) survey, conducted annually since 1984 in West Germany and since 1990 in East Germany (Haisken-DeNew and Frick 2005).<sup>3</sup> We study the total populations of East and West Germany as well as Turkish and other European foreigners in West Germany, the region where virtually all of the foreign population of Germany is concentrated.<sup>4</sup> We have also studied separately the German population in East and West, but it comprises such a large share of the total in

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<sup>3</sup> The data used here were made available to us by the German Socio-Economic Panel Study at the German Institute for Economic Research (DIW), Berlin. We follow Frijters et al (2004a) in starting the East Germany analysis with the 1991 survey, but we later draw on a less-used SOEP survey of East Germany conducted in June 1990.

<sup>4</sup> The term “foreigner” is based on nationality, not ethnic origin.

each region that the regional totals can be taken as a close approximation to the experience of Germans.

The analysis is based on the annual means of life satisfaction and the five economic variables for each region and population group.<sup>5</sup> (For definitions and descriptive statistics, see Appendix A.) The group means give estimates of the life satisfaction trends more representative of the population as a whole than trends derived from within-person regressions (Appendix B).

For absolute income we use mean household income of each population group adjusted to 1995 euros. “Relative income” is the ratio in a given year of mean household income for a given group to the mean for Germany as a whole. “Satisfaction with income” is the response on an integer scale from zero to 10 to the question “How satisfied are you with your household income?” In the survey this question is grouped with several others, each relating to satisfaction with a particular area of life such as the environment, health, standard of living, and the availability of goods and services. This group of domain satisfaction questions appears in a section of the survey quite separate from the life satisfaction question, which is usually the last question asked of respondents.

We created a measure of the unemployment rate (proportion of respondents in the labor force who are not currently employed) for each population group from the SOEP data, because official unemployment rates from the Federal Statistical Office Germany are only available for the regional aggregates and not the foreign population subgroups. The correlation between our measure and the official measures for East and West

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<sup>5</sup> The basic data are available from the authors and appear in IZA Discussion Paper No. 2494 available at <http://ftp.iza.org/dp2494.pdf>.



Germany as a whole from 1991 to 2004 is, respectively, 0.45 and 0.87. We do not have survey data for the inflation rate specific to each population group, so we use the official price index measures for West Germany and East Germany, the latter starting in 1991 (Statistisches Bundesamt 2007). These measures both end in 2002; thereafter, we assume the index for Germany as a whole applies to each region. We assume the inflation rate for West Germany as a whole applies to the two foreign population subgroups in that region.

Our analysis aims to establish the broad facts with regard to trends in life satisfaction and the association of life satisfaction with economic conditions. Throughout we rely principally on time series graphs of the summary measures, checking our impressions against ordinary least squares regressions. As will be seen, the patterns and relationships are usually evident from the graphs. For simplicity we omit the inflation rate from the graphs because in our data the inflation rate is rarely associated with life satisfaction. However, we include it in our regression analyses.

In analyzing the relation of life satisfaction to satisfaction with income a question arises about a possible common bias in the two measures. Responses on satisfaction, whether with life in general or household income, are known to be influenced by individual personality. Consider two persons, identical in all respects except personality traits. If one of them is neurotic and the other not, it is likely that the neurotic's responses on satisfaction with life in general and satisfaction with household income will both be lower than the other's because a neurotic tends to assess his or her circumstances more negatively (Diener and Lucas 1999). A correlation of life satisfaction with actual income or unemployment for the two individuals would show no relation because their objective economic circumstances are the same, but a correlation of life satisfaction with

satisfaction with income would show a perfect positive correlation because the neurotic is lower on both measures. This positive correlation would lead to the erroneous inference that income satisfaction was the source of the difference in life satisfaction between the two individuals, whereas the cause is, in fact, a personality difference that has similarly affected the responses on both life satisfaction and satisfaction with income. This is a real problem with point-of-time correlations of subjective responses of *individuals*, but the present analysis should be largely free of this personality bias because we study not point-of-time differences among individuals, but averages over time of population groups. Personality tends to be a stable individual characteristic and hence would not explain changes over time in group mean satisfaction responses.

In what follows we take up first the trends in life satisfaction and their association with economic conditions in East and West Germany. We then compare the experience of both Turkish and other European foreigners with that of Germans.

### **III. Results**

#### **East and West Germany**

The post-unification story of life satisfaction in East and West Germany is largely one of convergence, with life satisfaction trending upward in the East and downward in the West (Figure 1; here and in subsequent figures a vertical broken line divides the pre- and post-unification periods). This convergence is concentrated between 1991 and 1997, when, on a scale of zero to 10, the initial differential narrows from 1.3 to under 0.6 points. Life satisfaction in both regions levels off from 1997 through 2000 and then edges

downward. The post-2000 decline is slightly greater in the East and the differential widens a bit, by about 0.1 points.

In East Germany rising life satisfaction in the 1990s is associated with marked increases in both absolute and relative income (Figure 2, upper panel). It is the similar movement in this period of life satisfaction and absolute income that is stressed by Frijters et al (2004a). However, in the years subsequent to those covered in that study life satisfaction has fallen in East Germany while absolute income has leveled off. Relative income in these later years has declined, in contrast to the stability of absolute income. Considering the entire up and down trajectory of East German life satisfaction, relative income tracks the movement better than absolute income.

The third income measure, income satisfaction, also traces the swing in life satisfaction quite well, and, when fluctuations are considered, somewhat better than relative income (Figure 2, lower panel). The positive association in the figure between life satisfaction and satisfaction with income is by no means inevitable. In the United States the two move in almost diametrically opposed ways over the life cycle and also follow quite different paths across cohorts (Easterlin 2006, Easterlin and Sawangfa 2007). Fixed effects regressions on the panel data used here indicate that in East Germany life satisfaction declines with age while income satisfaction increases.

The movement in unemployment conditions in East Germany corresponds less well to life satisfaction than those of the income variables. The unemployment rate is plotted inversely in the present figures so that a downward movement in the curve would be expected to be associated with a downward movement in life satisfaction. Based on

the unemployment rate, one would have expected life satisfaction initially to worsen and then level off, not to rise and fall as it actually did.

These visual impressions are supported by simple bivariate regressions of life satisfaction on the economic variables. All three of the income measures are significantly and positively associated with life satisfaction, with the statistical fit improving as one moves from absolute income to relative income to satisfaction with income (Appendix A, Table A-5). In contrast, the unemployment rate is not significantly associated with life satisfaction at the 0.05 level or below. The inflation rate is significantly and negatively associated with life satisfaction. This is the only case in the present analysis where in a bivariate regression the inflation rate has a significant association in the expected direction. However, the inflation rate is not significant when paired in a multivariate regression with any of the three income variables.

In West Germany the relation of life satisfaction to the economic variables is somewhat different from the East. There is no evidence that life satisfaction is positively related to absolute income. Over the period from 1984 to 2004 absolute income increases by about 15 percent, while life satisfaction drifts downward (Figure 3, upper panel). Relative income, available only for 1992 onward, looks a little better than absolute income, trending downward at first, as does life satisfaction, but then it rises slightly while life satisfaction declines. Satisfaction with income appears more closely associated with life satisfaction than relative income in the post-unification period, the period in which the two economic variables overlap (Figure 3, lower panel). However, in the pre-unification period, income satisfaction does less well in tracking life satisfaction than in the post-unification period. In contrast to the pattern for East Germany, unemployment

conditions and life satisfaction move fairly similarly over the period from 1984 on, and the unemployment rate tracks life satisfaction about as well as income satisfaction. The results of bivariate regressions are consistent with the impressions conveyed by the figure (Appendix A, Table A-5, panel B). Contrary to what one would expect, the statistical association between absolute income and life satisfaction tends to be negative, and that between the inflation rate and life satisfaction, positive.

Taking East and West Germany together relative income and satisfaction with income are the economic variables most consistently associated with life satisfaction. Of the two, satisfaction with income is linked somewhat more closely to life satisfaction.

Seen in comparison with the results for West Germany, the unemployment results for East Germany are at first glance a puzzle. Between 1991 and 1999, the unemployment rate in East Germany increases from around 11 to 19 percent, yet life satisfaction improves by nearly half a point (Figure 2, lower panel). How is this possible? The answer probably lies in the massive public transfers from West to East Germany that were equivalent in this period to over 40 percent of East German GDP (Busch 1999, Table 1). A fair portion of these transfers were channeled into household incomes via unemployment, health care, and old age insurance benefits; public transfers in this period accounted for over a third of household income (Schwarze 1996, Table 1). These transfers substantially benefited the lower income segment of the population – pre-transfer income inequality in East Germany rose markedly, but post-transfer income inequality was only slightly above that in 1990 (Schwarze 1996, Table 2). The result of the transfers was a marked increase in household income in East Germany despite rising unemployment.

How do pre-unification movements of life satisfaction in East and West Germany compare with those after unification? The pre-unification data for West Germany span only seven years and fluctuate considerably, making a generalization about the trend difficult. Read in conjunction with the post-unification pattern, however, there appears to be little clear trend before 1991, up or down, while after that date a noticeable decline sets in (Figure 1). As will be seen, pre-unification stability and post-unification decline occur also among both groups of foreigners in West Germany.

What of life satisfaction in East Germany before unification? To answer this, there are data from an SOEP survey taken in June 1990 on the eve of formal unification in October. The sample size, panel and question format are largely the same as in the subsequent SOEP surveys, but the number of questions asked was about one-third fewer, hence the less frequent use of this survey. The satisfaction questions are the same as those asked subsequently.

According to the 1990 survey, life satisfaction in East Germany at that time, 6.59, was slightly above that reached at the post-unification peak in 1999, 6.51. In both years, East Germany is well below the West in life satisfaction, but the shortfall narrows from about 0.7 to 0.5 points because of the decline in West German life satisfaction after unification.

Life satisfaction in East Germany in 1990, however, is considerably higher than in the immediately following year, by over 0.5 points. Thus, the 1990 value signifies that life satisfaction in East Germany dropped abruptly after unification and that the surge in East German life satisfaction from 1991 to the late 1990s was largely a recovery to the 1990 level. In view of the substantial disruption of the East German economy following

unification (businesses shutting down and unemployment soaring) this scenario has a considerable degree of plausibility (Hughes Hallett and Ma 1993, Kandil 2001).

But can the 1990 data be credited? Are they comparable to those in subsequent years? One might wonder, for example, whether the June 1990 responses on life satisfaction might be inflated by a heritage of “preference falsification” from the police state era (Kuran, 1995), temporary euphoria due to the demise of the police state, or both. These are serious concerns and warrant further consideration.

Kuran’s concept of preference falsification refers to the disparity between one’s private views and those expressed publicly. It makes sense that for fear of reprisal, individuals in a police state would be reluctant to express to pollsters views unfavorable to the state. But this argument applies most clearly to opinions on political matters, and, indeed, it is with regard to political attitudes that Kuran explicitly develops his concept of preference falsification. Whether individuals would feel a need for preference falsification with regard to questions on personal life circumstances is less clear. Apparently, people did express publicly feelings of discontent with personal life even in the police state era. Thus, Kuran refers to newspapers receiving “letters of complaint in abundance” and gives examples relating to economic conditions (1991, pp. 29-30), but he notes that these complaints “tended to stay within a party-defined zone of acceptability” (1991, p.30). He also mentions surveys conducted by other communist governments of Eastern Europe and points out that their keeping the results secret supports the inference that they “were not entirely flattering to them or their policies” (1991, pp. 30, 31). Thus, it is far from clear that questions on personal life circumstances of the type used here would involve substantial preference falsification. The fact that the police state in East

Germany was dissolved when the 1990 survey had already been conducted further supports this conclusion.

Indeed, when one examines in detail the 1990 data, the evidence is against preference falsification. There is, first, a high degree of variability in 1990 in the means for satisfaction with specific domains of life, ranging from a low of 3.13 to a high of 7.54 on the zero to 10 scale (Table 1, col. 1). Moreover, the two domains with extremely low ratings (not much above 3) are those in which the East German economy was notoriously deficient: availability of goods and the environment. Mean values of satisfaction responses near 3.0 on a 0 to 10 scale are quite rare and reflect much dissatisfaction with these life domains. In contrast, the two domains with ratings above 7 are childcare and work, both of which were assured under socialism. Thus, the substantive nature of the 1990 responses on satisfaction with different domains accords with what one would expect if respondents were expressing their private preferences rather than presenting what the authorities want to hear. The assurance that the survey data were anonymous would reinforce the credibility of these responses.

What of the possibility that the responses in 1990 are inflated due to temporary euphoria?<sup>6</sup> If one compares life satisfaction and income satisfaction in 1990 and 1999, there is little evidence that in 1990 temporary euphoria due to political change added substantially to the 1990 value of life satisfaction beyond what might be expected from satisfaction with income (Table 1, columns 1 and 2). Both life satisfaction and income satisfaction differ very little between the two dates, a result consistent with our previous finding of a high statistical association between the two. If temporary euphoria

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<sup>6</sup> Note that if all years from 1990 on are equally inflated, there is no issue of 1990 not being comparable to later dates. Hence we make the extreme assumption here of temporary euphoria in 1990 and none in 1999.



substantially raised the 1990 value of life satisfaction relative to 1999, then with income satisfaction virtually identical in 1990 and 1999, one would expect life satisfaction to decline between the two dates. In fact, life satisfaction does decline, but only slightly, by 0.08 points. This compares with the previously noted drop in life satisfaction between 1990 and 1991 of 0.55 points. A reasonable conclusion is that relative to 1999 life satisfaction in 1990 might reflect some temporary euphoria, but not very much.

It is also pertinent to note that the changes in satisfaction by domain between 1990 and 1999 are quite plausible. As noted, income satisfaction is virtually identical at the two dates. Satisfaction rises in four other domains, those largely relating to material level of living: moderately in regard to standard of living and dwelling, greatly in the case of goods availability and the environment. In contrast, satisfaction falls in three domains that are the focus of public support under socialism: health, work, and childcare. This pattern seems in line with what one might expect to happen in a transition from socialism to capitalism, with material goods rising and social services declining.<sup>7</sup> In general, then, we conclude that the 1990 survey responses both on overall satisfaction with life and in specific domains are plausible and reasonably comparable to those in ensuing years.

There is also qualitative evidence consistent with the view that life satisfaction in East Germany declined noticeably after unification. Here is how one analyst contrasts pre-unification conditions with those immediately after unification:

Over the 40 years of its existence, the DDR had developed as a completely different state from the BRD. There was no unemployment, no (open) inflation, low work intensity, free

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<sup>7</sup> One might also expect inequality in life satisfaction to rise, but in fact, it is about the same at the two dates. The similarity of inequality is probably due to the role played by public transfers from West to East in supplementing household income, especially at lower income levels.

medical and social services, low prices for housing and public transport.

.....  
Less than one year after unification, a sense of disillusion, disadvantage and insecurity was being felt by many in the East. Some looked back to the DDR as a golden age where everything was simpler, the food tasted better, and people were members of the community. (Lumley 1995, pp. 29, 30)

An East German survey respondent in 1991 is quoted as follows:

The unification process is costing me personally DM400 each month. I include in this higher rental and transport costs as well as social costs. There are problems at all levels: traffic, crime, prices, rent, refugees, health care, social security. For me personally it is a vast and serious problem. People have lost old structures and certainties and don't know how to cope. I know that we here in the East have to go through a transition process, but it is difficult and for many no longer makes sense. (Lumley, p.30)

The unsettling effect of general economic and social uncertainty, illustrated here, is said to be a typical feature of transition economies (Philipov and Dorbritz 2003, p. 19).

Some may find it hard to credit that the transition from communist to non-communist rule in East Germany was accompanied by a marked decline in life satisfaction, even if temporary, because unification brought democracy to East Germany. Although political conditions are rarely mentioned by survey respondents as sources of

personal well-being (Easterlin 2000, Table 1), there is some cross sectional evidence suggesting that life satisfaction is positively associated with indicators of democracy (Frey and Stutzer 2000). But this finding is with numerous controls for other factors, especially economic variables. The transition in East Germany, like that in other East European transitions to democratic rule, was accompanied by severe economic disruption. In East Germany the abrupt deterioration in economic conditions appears to have more than dominated whatever effect political change may have had on life satisfaction. This appears to be true too for two other transition areas, Hungary and the Russian oblast (county), Tambov, for which there are rare survey data on subjective well-being under both communist and non-communist regimes (Inglehart and Klingemann 2000, p.173):

		Percent happy	Percent satisfied
Hungary	1981	78	71
	1990	68	56
Tambov	1981	64	76
	1995	47	25

In both areas a marked drop occurs in both measures of subjective well-being between 1981 and the 1990s. Based on data different from those used here, other analysts have concluded that life satisfaction declined in both Hungary and Russia between the 1980s and 1990s (Lelkes 2006, Saris 2001, Veenhoven 2001).

In both Hungary and Tambov, as in East Germany, the decline in life satisfaction was associated with marked economic deterioration. In East Germany, real GDP at its low in 1991 was 68 percent of the 1989 value (Philipov and Dorbritz, p.29). Hungary's low in 1993 was almost one-fifth the 1989 level. The Russian Federation reached a low in

1998 that was 56 percent of the 1989 value, and it is highly unlikely that Tambov oblast was immune to such a precipitous collapse. We conclude therefore that the experience of other transition areas is consistent with both quantitative and qualitative evidence for East Germany that life satisfaction there declined considerably in conjunction with severe economic disruption.

### **Turkish and other European Foreigners in West Germany**

When the life satisfaction of foreigners is compared with that of Germans, East and West, the most striking feature is the relative decline of the Turkish population post-unification (Figure 4).<sup>8</sup> If we take the 1990 survey as indicative of pre-unification life satisfaction in East Germany, then prior to unification the ordering of the various population groups is as follows: Germans and other European foreigners in West Germany at roughly the same level, followed by Turkish foreigners about 0.4 points lower, and then East Germans, lower still by perhaps another 0.3 points. This ordering continued post-unification, but life satisfaction of the Turkish population slipped relative to the other groups and by 2004 was only slightly above that of East Germans. All of the economic variables exhibit essentially the same ordering and the same relative deterioration for the Turkish population, except the inflation rate, for which relevant data are not available.

Pre-unification stability and post-unification decline in Turkish life satisfaction is mostly clearly connected with similar movements in unemployment conditions and income satisfaction (Figure 5, lower panel). Absolute income of the Turkish population

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<sup>8</sup> Germans comprise 90 percent of the West German population and 99 percent of the East German; hence we take the regional aggregates of Figure 1 as representative here of the life satisfaction of Germans in the two regions.

rose and fell in a pattern bearing little semblance to life satisfaction, but relative income in the period for which that measure is available, 1992 onward, looks a little better (Figure 5, upper panel). Bivariate regressions support these impressions, with income satisfaction and the unemployment rate having the highest statistical association with life satisfaction (Appendix A, Table A-5, panel C). The inflation rate tends to be positively rather than negatively associated with life satisfaction, as for West Germany as a whole, but is not statistically significant.

For other European foreigners the relation of life satisfaction to the economic variables is much like that for the Turkish population, but because the deterioration in economic conditions was less severe for other European foreigners, they do not exhibit the relative decline in life satisfaction experienced by the Turkish population (Figures 4, 6, and Appendix A, Table A-5, panel D). In the bivariate regression analyses the principal difference between Turkish and other European foreigners is that for other Europeans the association of life satisfaction with the unemployment rate falls short of statistical significance. Satisfaction with income, however, continues to exhibit a significant positive relation to life satisfaction.

Two possible economic explanations, not mutually exclusive, come to mind for the greater decline in life satisfaction and economic circumstances of the Turkish population relative to other population groups.<sup>9</sup> One is that the Turkish population has suffered more than the other groups from the slippage in growth of aggregate demand and the general deterioration of employment conditions in Germany as a whole. A second possible explanation is that the Turkish population has experienced increasing

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<sup>9</sup> On the non-economic side, there is the possibility that racial tensions and/or anti-immigrant sentiment increased during this period.

competition from migrants from the East. The evidence seems less supportive of the competition hypothesis. Almost three-fourths of the Turkish population have less than a high school education; for migrants from East Germany the corresponding figure is about one-eighth. Consistent with this education differential, almost two-thirds of Turkish workers are in blue collar unskilled and semi-skilled jobs; for migrants, the proportion is less than a fourth. Thus, the influx of East Germans probably had a fairly minor impact on the labor markets in which Turkish workers are concentrated. It seems, therefore, that the greater decline in life satisfaction among the Turkish population is probably due chiefly to the general worsening of employment conditions in Germany that especially hurt those in less-skilled blue collar jobs.

For Turkish and other European foreigners, as for East and West Germany, the economic variable most consistently associated with life satisfaction is satisfaction with income. Because our regression analyses are based on group means and the number of observations is small, we have also done, as a rough check of our results, fixed and random effects regressions of life satisfaction on household income, unemployment, and satisfaction with income on individual data for each of the population groups, with controls for age and marital status (Appendix C). (We also did random coefficients regressions, but do not report them here because the results are virtually identical to those for random effects.) For a more direct comparison between these regressions and our results, we ran the same multivariate regressions on the time series data (Table A-5, model 6). As noted in Appendix B, within-person regressions do not necessarily match time series regressions on population means. Yet the principal conclusions of our analysis hold up in the within-person regressions. Satisfaction with income stands out in

both sets of regressions as the variable most closely associated with life satisfaction. Household income, in contrast, has little association, typically being not significant or having the wrong sign. Unemployment is the only variable for which the results differ (significantly negative in the within-person regressions and not significant in the multivariate time series regressions), a difference perhaps due to the small number of time series observations.

#### **IV. Conclusions and Implications**

Life satisfaction just before unification in Germany was highest among Germans and other European foreigners in West Germany, Turkish foreigners were somewhat lower, and East Germans lower still. In West Germany there is little evidence of a trend up or down before 1991. In East Germany the deterioration of economic conditions after 1990 reduced life satisfaction substantially, but by the late 1990s, as economic conditions normalized somewhat, East German life satisfaction recovered considerably, almost to the level of 1990. It may be that the East German pattern is indicative of the life satisfaction trend in many of the transition societies of Eastern Europe and the successor states of the former Soviet Union: a substantial drop and then gradual upturn in life satisfaction accompanying severe economic disruption followed by slow improvement. It is possible, however, that the East German picture for life satisfaction is more favorable in both the speed and magnitude of recovery because of the substantial income transfers from West to East Germany.

In West Germany life satisfaction trended slightly downward in the years immediately following unification, leveled off to about 2000, and subsequently edged

further downward. For the Turkish population, however, the post-unification downtrend was larger and continuous, and by 2004 life satisfaction of the Turkish population was only slightly higher than that of East Germans. The decline in the relative position of the Turkish population post-unification appears to be due largely to the greater impact of a weakening economy on less-skilled blue collar work, that in which the Turkish population is disproportionately concentrated.

In general, measures of relative income are more consistently associated with life satisfaction than absolute income. Of the two measures of relative income studied, satisfaction with income and the ratio of household income of any given population group to that of Germany as a whole, the former is more closely related to life satisfaction. The close association between life satisfaction and satisfaction with income is by no means inevitable; in the United States life satisfaction and income satisfaction move differently over the life cycle and also across cohorts; in East Germany they move in opposite directions over the life cycle. The unemployment rate is also typically associated (inversely) with life satisfaction. We rarely find a significant association between life satisfaction and the inflation rate, but our measure of the inflation rate is less satisfactory than for the other economic variables.

To say that life satisfaction is most closely associated with income satisfaction is not to imply that income and macroeconomic conditions are not important. Income satisfaction is clearly affected by what happens to absolute income and the unemployment rate. But taken singly, income satisfaction appears to contain somewhat more information than the other variables. This is suggested by both bivariate and multivariate time series regressions, as well as within-person regressions, in which



income satisfaction is typically the variable most closely associated with life satisfaction. We have suggested that the additional information contained in income satisfaction is, in part, that relating to the level of and change in reference points for evaluating income by the various population groups. Clearly, how evaluations of income are formed is a subject on which more research is needed. The special analytical contribution of this paper is in demonstrating the substantial extent to which feelings of well-being are linked to relative income, and especially income satisfaction.

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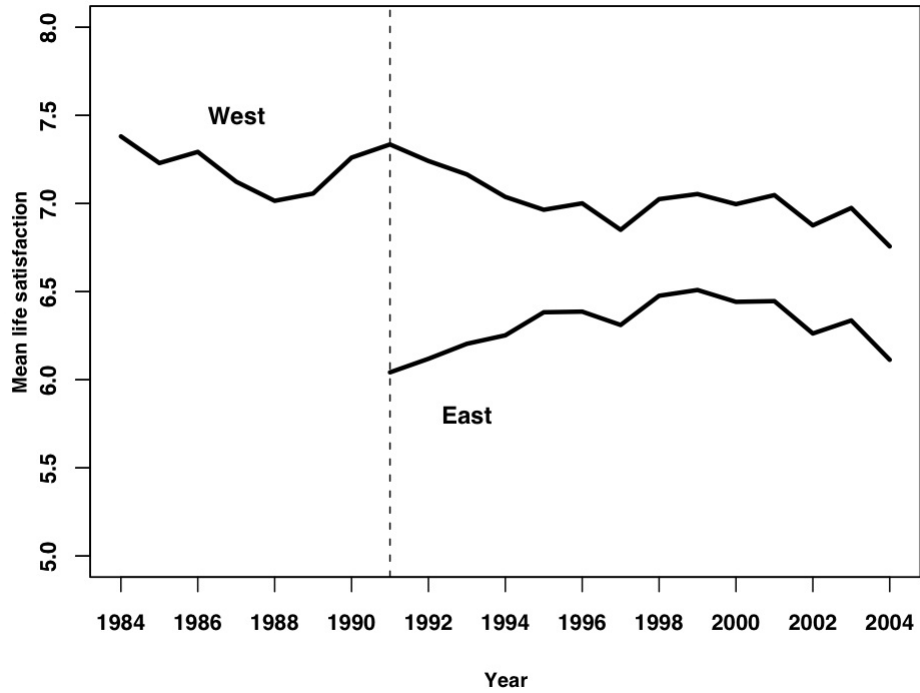
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**Figure 1**

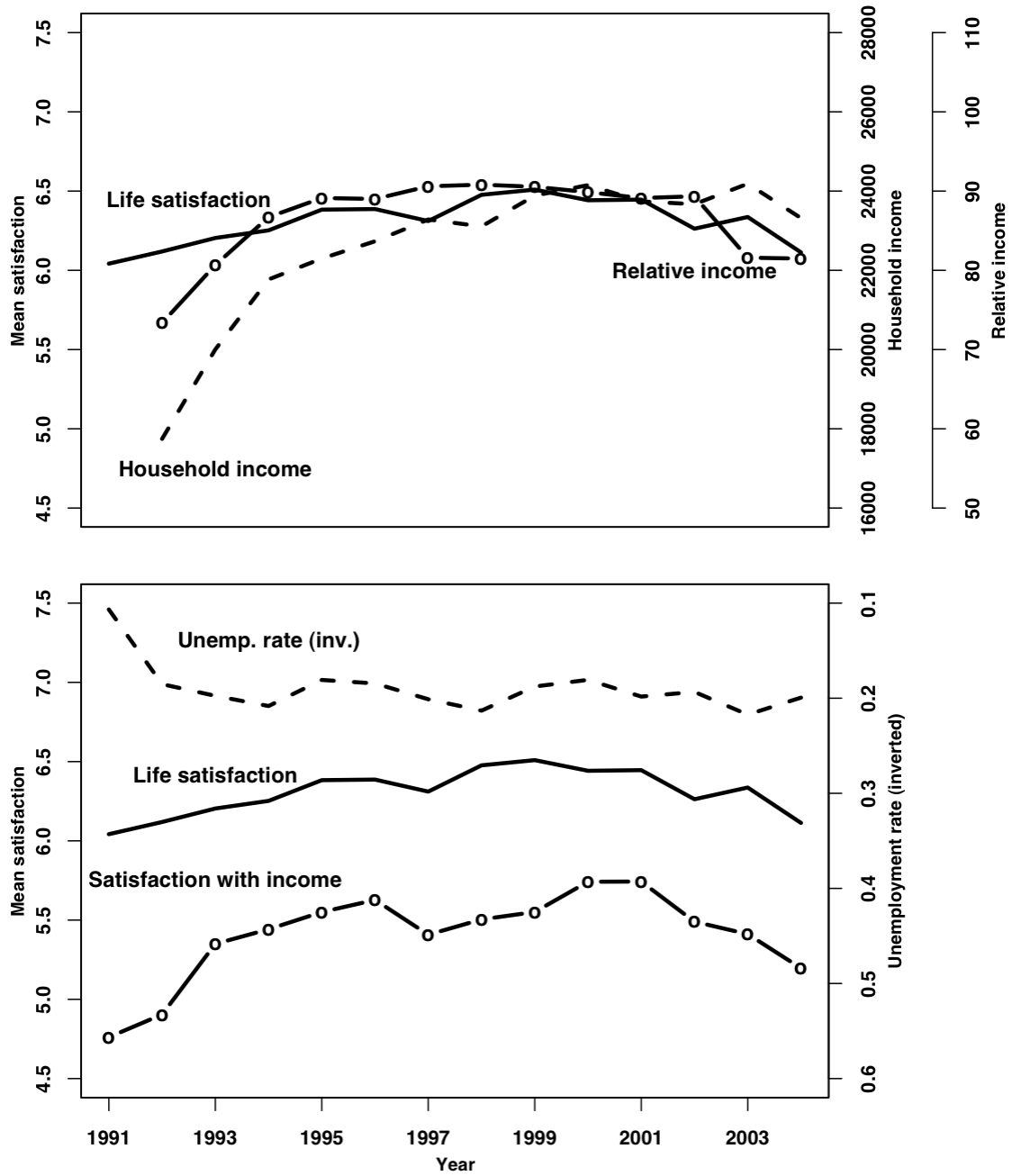
**Life Satisfaction in East Germany, 1991-2004, and West Germany, 1984-2004**



Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Tables A-3, A-4.

**Figure 2**

**Life Satisfaction and Specified Economic Variables, East Germany, 1991-2004**

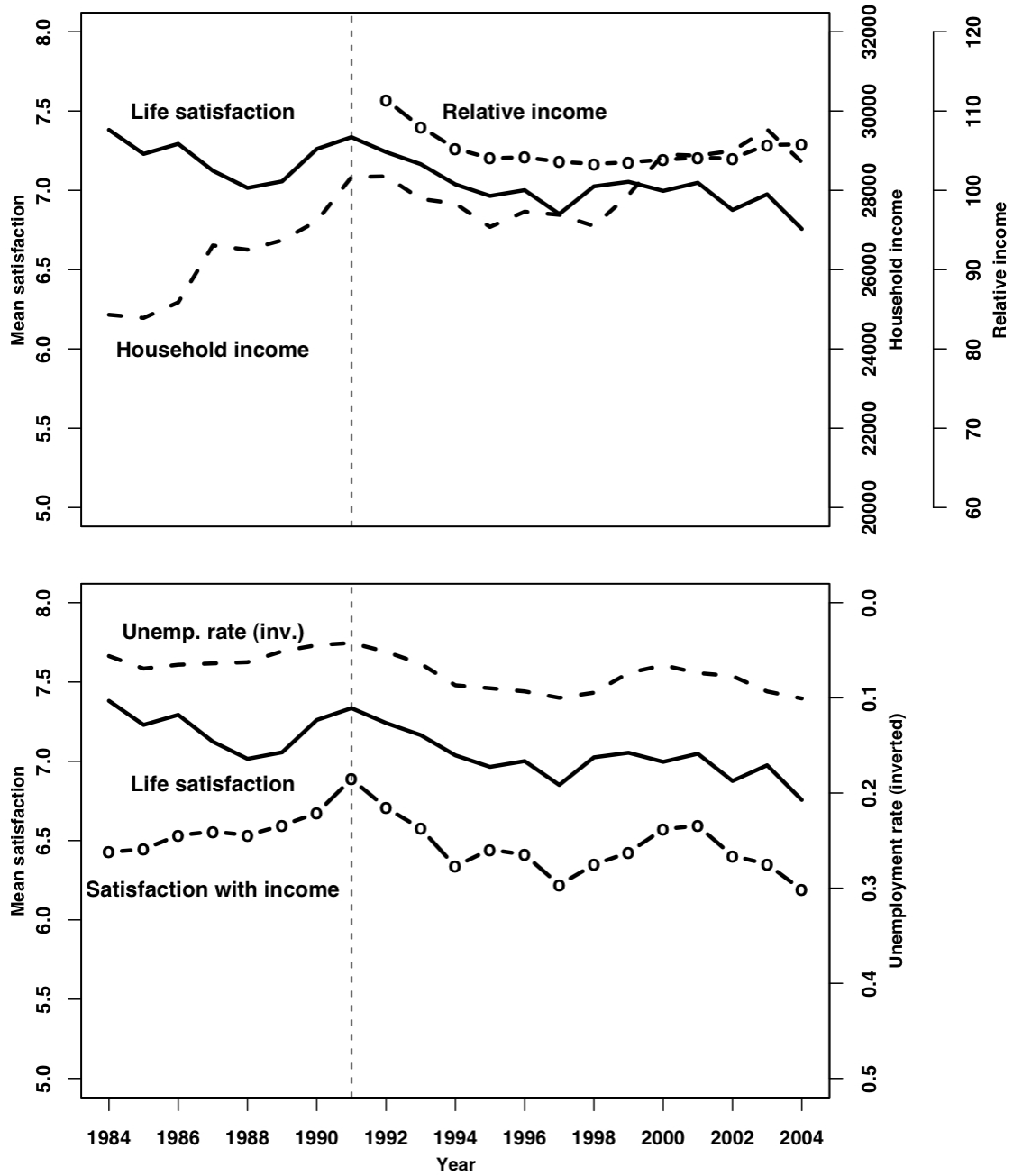


Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Table A-4.



**Figure 3**

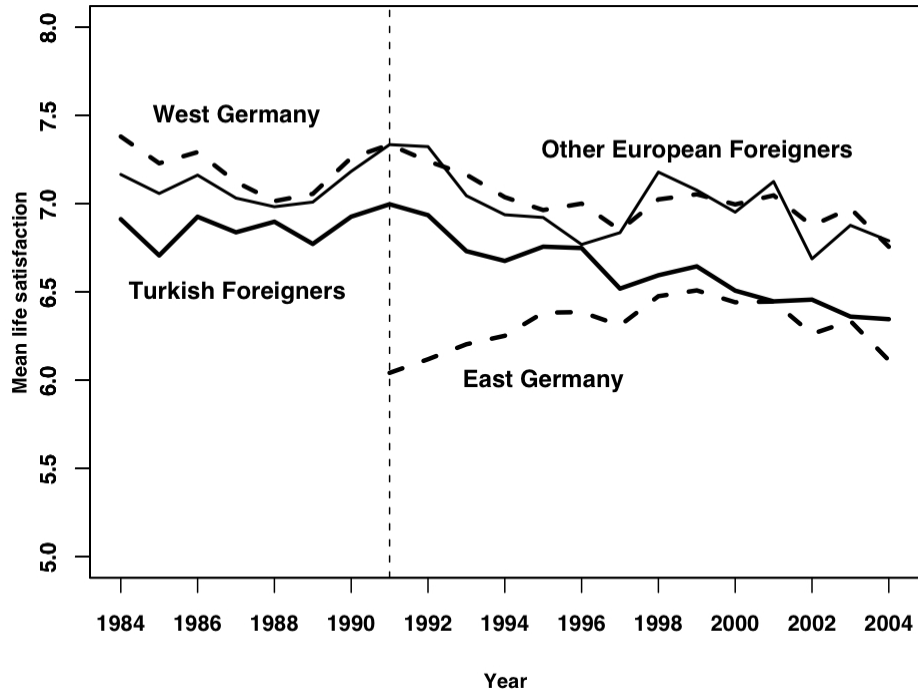
**Life Satisfaction and Specified Economic Variables, West Germany, 1984-2004**



Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Table A-3.

**Figure 4**

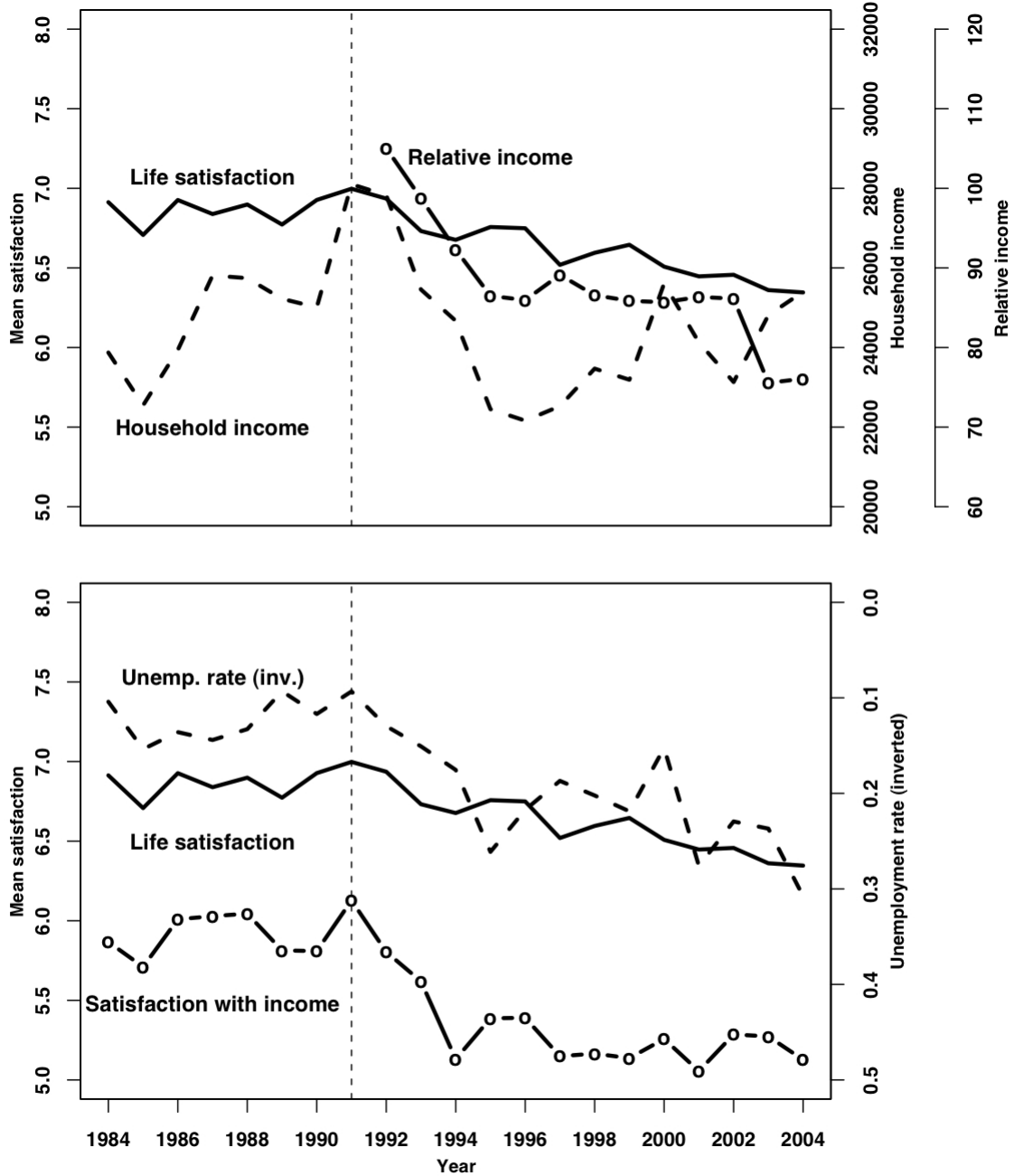
**Life Satisfaction of Foreigners in West Germany Compared with That in East and West Germany, 1984-2004**



Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Tables A-3 to A-6.

**Figure 5**

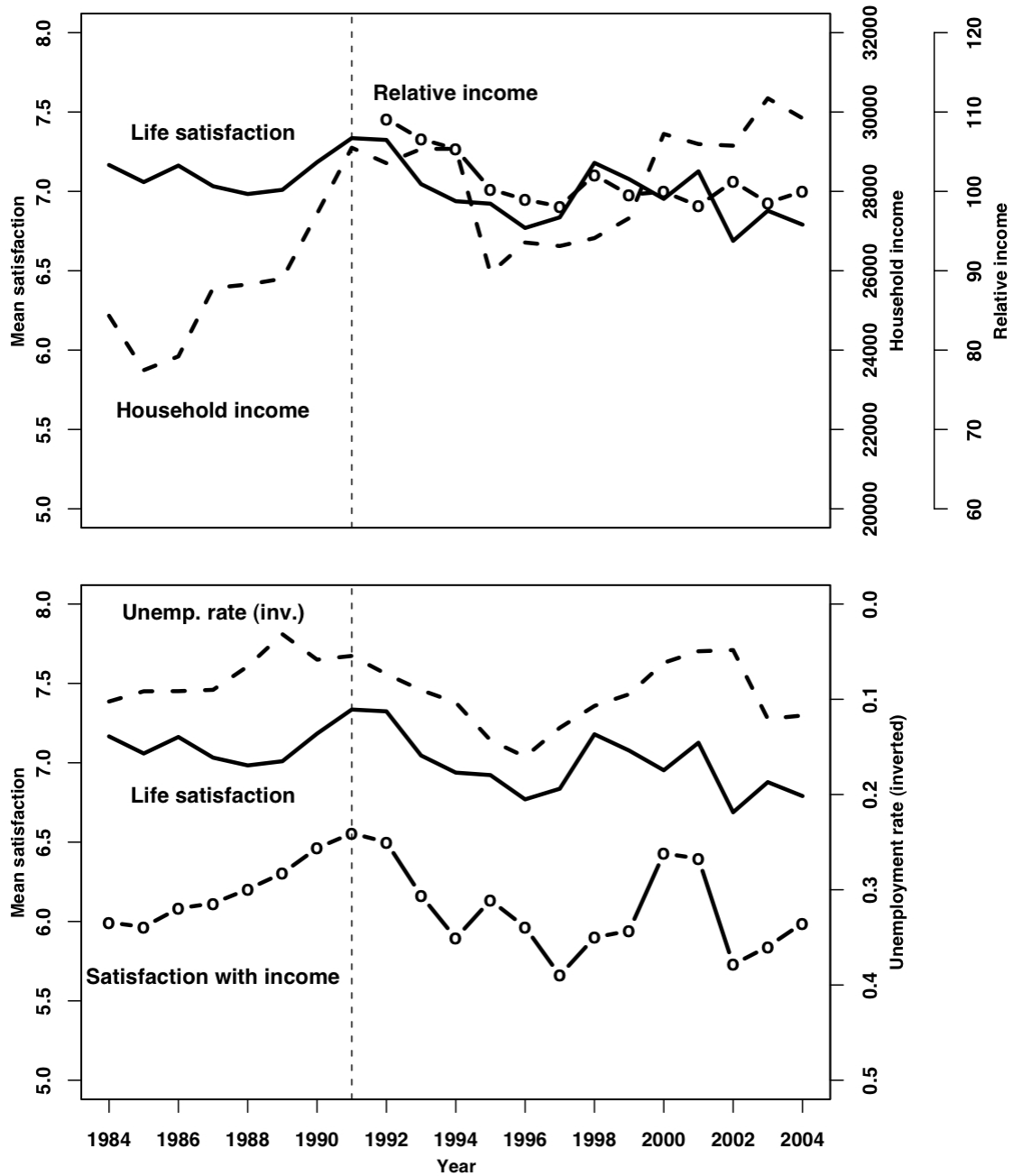
**Life Satisfaction and Specified Economic Variables, Turkish Foreigners, West Germany, 1984-2004**



Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Table A-5.

**Figure 6**

**Life Satisfaction and Specified Economic Variables, European Foreigners, West Germany, 1984-2004**



Source: IZA DP No. 2494 (<http://ftp.iza.org/dp2494.pdf>), Appendix A, Table A-6.

**Table 1****Life Satisfaction and Satisfaction with Specified Domains of Life, East Germany,  
June 1990 and 1999**

	(1) 1990	(2) 1999	(3) Change 1990 to 1999
<b>Satisfaction with:</b>			
<b>Life in general</b>	6.59	6.51	-0.08
<b>Household income</b>	5.54	5.55	+0.01
<b>Standard of living</b>	6.36	6.56	+0.20
<b>Dwelling</b>	6.93	7.32	+0.39
<b>Goods availability</b>	3.18	6.17	+2.99
<b>Environment</b>	3.13	6.50	+3.37
<b>Health</b>	6.62	6.20	-0.42
<b>Work</b>	7.23	6.48	-0.75
<b>Childcare</b>	7.54	6.48	-1.06

## Appendix A

### Descriptive Statistics, and Time Series Regressions

**Table A-1**  
East Germany, 1991-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	14	6.31	0.15	6.04	6.51
Satisfaction with income	14	5.41	0.28	4.76	5.74
HH income	13	22,607	1,856	17,746	24,185
Relative income	13	86.3	5.4	73.4	90.8
Unemployment rate	14	0.190	0.026	0.107	0.217
Inflation rate	13	0.034	0.040	0.004	0.134

**Table A-2**  
West Germany, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	21	7.08	0.16	6.76	7.38
Satisfaction with income	21	6.49	0.16	6.19	6.89
HH income	21	27,426	1,339	24,781	29,536
Relative income	13	105.1	2.3	103.3	111.4
Unemployment rate	21	0.072	0.018	0.042	0.101
Inflation rate	21	0.019	0.011	-0.001	0.039

**Table A-3**  
Turkish foreigners, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	21	6.70	0.20	6.35	7.00
Satisfaction with income	21	5.53	0.37	5.06	6.13
HH income	21	24,529	1,643	22,163	28,103
Relative income	13	87.7	7.9	75.6	105.1
Unemployment rate	21	0.177	0.062	0.093	0.308
Inflation rate	21	0.019	0.011	-0.001	0.039

**Table A-4**  
Other European foreigners, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	21	7.02	0.17	6.69	7.34
Satisfaction with income	21	6.11	0.26	5.66	6.56
HH income	21	27,334	2,026	23,493	30,346
Relative income	13	101.4	3.5	98.1	109.2
Unemployment rate	21	0.090	0.033	0.032	0.160
Inflation rate	21	0.019	0.011	-0.001	0.039

**Table A-5**

**OLS Time Series Regression of Mean Life Satisfaction on Specified Economic Variables**

	<u>Regression coefficients (t-stat in parenthesis)</u>								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	HH income x 10 <sup>5</sup> (1995 euros)	Rela- tive income, %	Satis- faction with income	Unem- plov- ment rate, %	Infla- tion rate, %	Con- stant	n	Adj. R <sup>2</sup>	Prob > F
<b>A. East Germany, 1992-2004<sup>a</sup></b>									
1	4.32 (2.59)					5.349 (14.14)	13	0.3229	0.0250
2		0.019 (4.18)				4.687 (11.92)	13	0.5785	0.0015
3			0.450 (6.23)			3.871 (9.89)	14	0.7439	0.0000
4				2.440 (1.70)		5.844 (21.33)	14	0.1277	0.1142
5					-2.018 (-2.56)	6.395 (159.9)	13	0.3173	0.0263
6	0.158 (0.07)		0.472 (2.74)	0.201 (0.09)		3.674 (4.21)	13	0.5784	0.0125
<b>B. West Germany, 1984-2004<sup>b</sup></b>									
1	-6.46 (-2.70)					8.853 (13.49)	21	0.2399	0.0141
2		0.033 (2.43)				3.554 (2.51)	13	0.2911	0.0331
3			0.686 (4.08)			2.628 (2.41)	21	0.4391	0.0006
4				-7.007 (-5.40)		7.587 (78.44)	21	0.5845	0.0000
5					4.796 (1.46)	6.988 (96.47)	21	0.0532	0.1613
6	-5.744 (-3.32)		0.473 (1.66)	-2.221 (-0.84)		5.748 (3.14)	21	0.7185	0.0000

<sup>a</sup> Models 3, 4 for 1991-2004.

<sup>b</sup> Model 2 for 1992-2004.

**Table A-5 continued**

<b>Regression coefficients (t-stat in parenthesis)</b>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	HH income x 10 <sup>5</sup> (1995 euros)	Rela- tive income, %	Satis- faction with income	Unem- ploy- ment rate, %	Infla- tion rate, %	Con- stant	n	Adj. R <sup>2</sup>	Prob > F
<b>C. Turkish foreigners, West Germany, 1984-2004<sup>a</sup></b>									
1	4.25 (1.61)					5.658 (8.74)	21	0.0741	0.1232
2		0.018 (4.67)				5.014 (14.8)	13	0.6342	0.0007
3			0.468 (7.19)			4.112 (11.40)	21	0.7172	0.0000
4				-2.553 (-5.48)		7.153 (82.12)	21	0.5923	0.0000
5					4.024 (0.97)	6.623 (72.46)	21	-0.0030	0.3446
6	-1.48 (-0.90)		0.369 (3.42)	-0.984 (-1.56)		5.195 (7.15)	21	0.7305	0.0000
<b>D. Other European foreigners, West Germany, 1984-2004<sup>b</sup></b>									
1	-1.54 (-0.80)					7.444 (14.03)	21	-0.0186	0.4354
2		0.027 (2.07)				4.196 (3.13)	13	0.2138	0.0633
3			0.439 (3.72)			4.340 (6.01)	21	0.3905	0.0015
4				-2.017 (-1.84)		7.203 (68.67)	21	0.1060	0.0820
5					5.771 (1.68)	6.911 (91.61)	21	0.0841	0.1085
6	-2.38 (-1.59)		0.448 (3.13)	-0.226 (-0.21)		4.955 (4.98)	21	0.4075	0.0075

<sup>a</sup> Model 2 for 1992-2004.

<sup>b</sup> Model 2 for 1992-2004.



## **Appendix B**

### **Comparison of Time Series and Within-Person Trends in Life Satisfaction**

The present analysis centers on the population means for life satisfaction at each date. These means are the same as the annual values yielded by an ordinary least squares regression of life satisfaction on time dummies. Because we have panel data, we also ran within-person regressions, both fixed and random effects, on time dummies. (Random coefficients regressions were also estimated, but the results were virtually identical to those for random effects.)

Table B-1 compares the various methods with regard to the estimated decline in life satisfaction over the entire time span analyzed here for each of the four population groups. For every population group the within-person regressions yield larger declines in life satisfaction, and the differences from the results of the ordinary least squares regressions are sizable in magnitude.

The reason for the greater declines estimated by within-person regressions appears to be that they do not reflect the fact that the sample refreshment population has higher mean levels of life satisfaction than the continuing population in the sample (Table B-2, lines 2 and 3). The purpose of the refreshment population is to maintain the representativeness of the actual population at each date. The annual group means, the values estimated from an ordinary least squares regression, incorporate the effect of the refreshment population's relatively higher mean level and therefore make for a more representative estimate of life satisfaction of the population as a whole in each year.

**Table B-1**

**Change in Life Satisfaction from Regression on Time Dummies, Various Statistical Methods, Specified Population and Period**

Method	<u>West Germany, 1984 - 2004</u>			East Germany, 1990 - 2004
	All	Turkish foreigners	Other European foreigners	
OLS (weighted data)	-0.62	-0.57	-0.38	-0.48
OLS (unweighted data)	-0.47	-0.58	-0.66	-0.30
Fixed effects	-1.15	-1.04	-1.38	-0.79
Random effects	-0.82	-0.83	-1.08	-0.58

**Table B-2**

**Mean Life Satisfaction of Persons Surveyed in 2004 According to Presence at First Survey Date**

Persons in 2004 by presence in initial survey	<u>West Germany, Initial survey 1984</u>						East Germany, Initial survey 1990	
	n	All LS	n	Turkish foreigners LS	n	Other European foreigners LS	n	LS
All	13,958	6.76	509	6.35	666	6.79	4,737	6.11
Included	3,426	6.38	177	5.67	278	5.85	1,934	5.85
Not included	10,532	6.88	332	6.56	388	7.15	2,803	6.22

## Appendix C

### Descriptive Statistics and Within-Person Regressions

**Table C-1**  
East Germany, 1992-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	48,668	6.32	1.84	0	10
Satisfaction with income	47,710	5.43	2.33	0	10
HH income	48,814	22,480	12,291	0	222,930
Unemployed (yes = 1)	48,814	0.13	0.33	0	1
Married (yes = 1)	48,813	0.55	0.50	0	1
Age	48,814	47.59	18.13	16	99

**Table C-2**  
West Germany, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	205,410	7.08	1.89	0	10
Satisfaction with income	202,599	6.48	2.30	0	10
HH income	206,177	27,362	17,211	0	380,347
Unemployed (yes = 1)	206,177	0.04	0.20	0	1
Married (yes = 1)	181,043	0.57	0.50	0	1
Age	206,177	46.99	18.35	14	102

**Table C-3**  
Turkish foreigners, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	15,520	6.70	2.04	0	10
Satisfaction with income	15,417	5.50	2.38	0	10
HH income	15,597	24,553	12,356	0	166,502
Unemployed (yes = 1)	15,597	0.11	0.32	0	1
Married (yes = 1)	6,270	0.73	0.44	0	1
Age	15,597	36.78	13.60	15	84

**Table C-4**  
European foreigners, 1984-2004

Variable	n	Mean	Std. Dev.	Min	Max
Life satisfaction	24,930	7.03	1.93	0	10
Satisfaction with income	24,635	6.11	2.30	0	10
HH income	25,009	27,305	13,577	0	182,907
Unemployed (yes = 1)	25,009	0.07	0.25	0	1
Married (yes = 1)	9,394	0.67	0.47	0	1

Age 25,009 41.78 14.45 15 91

**Table C-5**

**Fixed and Random Effects Regressions of Life Satisfaction on Specified Economic Variables<sup>a</sup>**

<u>Regression coefficients (t-stat in parenthesis)</u>							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HH income x 10 <sup>5</sup> (1995 euros)	Satis- faction with income	Unem- ployed	Num- ber of obser- vations	Num- ber of per- sons	R <sup>2</sup> within	R <sup>2</sup> bet- ween	R <sup>2</sup> overall
<b>A. East Germany, 1992-2004</b>							
1. Fixed effects							
0.126 (1.42)	0.243 (63.82)	-0.423 (-18.71)	48,156	7,634	0.1132	0.2971	0.2240
2. Random effects							
0.252 (3.76)	0.283 (81.91)	-0.440 (-20.70)	48,156	7,634	0.1116	0.3517	0.2595
<b>B. West Germany, 1984-2004</b>							
1. Fixed effects							
-0.029 (-0.99)	0.259 (126.09)	-0.410 (-21.55)	184,101	28,224	0.1210	0.1533	0.1407
2. Random effects							
-0.017 (-0.74)	0.301 (162.89)	-0.0449 (-25.27)	184,101	28,224	0.1132	0.2996	0.2380
<b>C. Turkish foreigners, 1984-2004</b>							
1. Fixed effects							
-0.049 (-0.21)	0.308 (26.23)	-0.285 (-3.90)	6,192	1,470	0.1498	0.3380	0.2866
2. Random effects							
-0.043 (-0.22)	0.353 (35.44)	-0.335 (-5.17)	6,192	1,470	0.1485	0.3528	0.2973
<b>D. Other European foreigners, 1984-2004</b>							
1. Fixed effects							
0.043 (0.37)	0.278 (29.75)	-0.345 (-4.96)	9,485	2,670	0.1568	0.2274	0.2202
2. Random effects							
0.073 (0.83)	0.336 (43.12)	-0.428 (-6.96)	9,485	2,670	0.1499	0.3126	0.2793

<sup>a</sup> All regressions include controls for age and marital status. In a separate run health status, not available before 1992 and in 1993, was also included, with essentially the same findings.