Migrant's Pursuit of Happiness.

The Impact of Adaptation, Social Comparison and Relative Deprivation: Evidence from a 'Natural' Experiment[1]

© 2012, *Silvia Maja Melzer (University of Bielefeld)*[2]

Ruud J. Muffels (Tilburg University)

Abstract: The German reunification, which several economists have called a "natural" experiment, provides the unique possibility to inquire the impact of migration on subjective well-being (SWB). The main goal of the research is to assessing the impact of adaptation, social comparison and relative deprivation on the change in SWB associated with moving from Eastern to Western Germany after the German reunification in 1989. We suspect that the gains or losses in subjective well-being after migration are affected by the way migrants adapt to their new economic conditions, by with whom migrants compare themselves (that is, their reference group), their former peers in the East or their new peers in the West, and how well they integrate into the new society, that means whether they are relatively deprived with respect to earnings or not. We estimate fixed- and random-effects Generalized Least Square panel regression models. Our results indicate a positive and lasting effect of migration on SWB, although it is strongly suppressed by dissatisfaction resulting from the comparison of migrants' income with the incomes of their former peers in East Germany and the relatively higher earnings of their new peers in West Germany. Moreover, our analyses provide an explanation for the increase of SWB associated with an increase in income found in East Germany after the reunification; a deviation from the Easterlins' paradox.

Keywords: migration, subjective well-being, happiness, social comparison, adaptation, relative deprivation, German panel data, panel regression models, natural experiment

JEL: I32, J24, J61, J62

1. Motivation

The literature on migration research points out, that people migrate for economic reasons; to improve their income and living standard as well as their subjective well-being (SWB). However, the literature on the relationship between income and happiness generally suggests that "money does not buy happiness", implying that for the average person, increases in absolute income does not significantly increase happiness. Therefore, the question arises as to whether this is also true for migrants, suggesting that their gain in absolute income after migration does also not improve their SWB?

The existing literature provides a puzzle rather than an answer to this question. On one hand, studies comparing the subjective well-being (SWB) of immigrants and natives find lower SWB among first-generation (Amit 2010; Bălţătescu 2007; Bartram 2010) and even second-generation immigrants (Neto 1995) compared to natives. On the other hand, studies comparing the SWB of immigrants before and after relocating present a more positive picture, as migrants generally report improved SWB after relocating (De Jong, Chamratrithirong, and Tran 2002; Lundholm and Malmberg 2006). How can this paradox be explained?

The purpose of this paper is to answer this question and investigate the impact of migration on SWB. The main goal is to examine changes in migrants' SWB associated with moving from Eastern to Western Germany after the 1989 German reunification. To this end, the two main approaches used in the literature to investigate the situation of migrants are combined and put to an empirical test. We compare the migrants' situation in both their region of destination (Western Germany) and origin (Eastern Germany) with the native populations in both regions who did not relocate. The German reunification, which several economists have called a "natural" experiment, provides the unique possibility to analyze the impact of migration on SWB using longitudinal data containing information from before and after relocation. Only by bridging the two approaches found in the literature is it possible to determine, first, whether immigrants are happier after relocating and, second, whether the change in well-being is mediated by adaptation, social comparison and relative deprivation processes (Festinger 1954; Runciman 1966). Research on SWB in positive psychology, sociology and welfare economics supports the hypotheses that life satisfaction is strongly affected by social comparison with relevant others (peers), adaptation to the changes in income associated with migration and social and economic integration (e.g., Easterlin 1974; 2001; 2005; Stark and Bloom 1985). We suspect that the change in SWB is most affected by adaptation to the income effects of migration and by social comparison, that is, the group with

whom migrants compare themselves – their former peers in the East or their new peers in the West. Social comparison theory does not render prima facie evidence on what comparison process takes place for migrants. We expect also that the extent to which migrants appear capable of integrating in the West (as measured by increases in their relative income) might affect the social comparison process and mediate the effect of migration on subjective well-being.

Our results offer an explanation for the fact that the two lines of research came to such contrasting findings: mainly due to focusing just on one part of the picture. Moreover, we show that the consequences for migrants indeed differ from those of the general population. While migrating women gain compared to non-migrating women relatively more in SWB from the income gains associated with migration, men's SWB is more negatively affected due to the comparison with their East and West German colleagues, than this would be the case for non-migrants. Finally, our analyses provides an empirical explanation for Easterlin's paradox (1974; 2001; 2005) and help to explain why Eastern Germany was one of the countries that deviated from Easterlin's paradox and experienced an 'atypically' increase in SWB associated with the general rise in incomes after the reunion as was described by Frijters et al. (2002).

2. Previous research and theory

The most recent research focuses on the life satisfaction of immigrants and natives in the US. Bartram's (2010) analysis, which is in line with other studies in this field (Amit 2010; Bălţătescu 2007; Neto 1995) using the cross-sectional World Values Data, suggests that being an immigrant in the US is associated with lower levels of life satisfaction compared to US natives. Bartram (2010) also finds that immigrants from poorer countries report lower levels of life satisfaction than US natives, although the life satisfaction of immigrants from more prosperous societies in Europe and Canada does not differ significantly from that of the US native population. Bartram (2010) concludes that the life satisfaction of migrants from poorer countries is more strongly determined by their absolute level of income. He suggest that the extra happiness migrants obtain from the increase in their absolute income after migration seems to be outweighed by the dissatisfaction created by comparing their relatively low incomes to those of US natives. This explanation seems to suggest that the group of migrants from poorer countries integrate less well because they earn lower incomes than do migrants

from prosperous countries. As migrants spend more time in their new country, they might change their comparison group and increasingly compare themselves with their new peers instead of their former peers in their country of origin, causing dissatisfaction with their relatively low incomes compared to their new peers' incomes.

The literature, despite providing substantial insights into migration and deepening our understanding of the process, is rather limited in several respects. Few studies have started from a theoretical framework, and their hypotheses are mainly derived from empirical evidence (e.g., Lundholm and Malmberg 2006). To the best of our knowledge, no studies test hypotheses derived from social comparison theory to explain changes in migrants' SWB.[1] However, the theoretical framework of social comparison and relative deprivation, originally elaborated by Festinger (1954) and Runciman (1966) but applied to migration and further developed by Stark and co-authors, might help improve our understanding of the relationships between migration, integration, and changes in SWB (Stark 1991; Stark and Bloom 1985; Stark and Taylor 1989).

Second, longitudinal data containing information on individuals' SWB before and after migration are ideal for research into the changes in SWB due to migration. However, such data are almost nonexistent. To the best of our knowledge, there is only one study using longitudinal data (Melzer 2011a). However, this study concentrates on the comparison of the SWB of migrants before and after the relocation with people from the country of origin, ignoring the comparison of migrants' SWB with the population in the destination country. All existing studies comparing the SWB of immigrants and "natives" in the country of destination rely on cross-sectional data collected after relocation. Using cross-sectional data, the causality between the described factors and SWB is far from obvious (c.f., Frey and Stutzer 2005). Whereas genetic factors, such as sex and personality traits, are causally clearly antecedent to choice, other factors concerning life goals, such as striving for success in one's career or desiring children, and life choices, such as marriage and migration, may be partly endogenous and may show reverse causality. Therefore, even when a positive effect of migration on SWB is found, it cannot be determined whether migration makes people happier or happy people are more inclined to migrate.

Third, adaptation and social comparison income effects of migration have not yet been addressed in the literature. Even if relocation increases migrants' absolute income, the switching of the comparison group to the new peers in the destination country might harm migrants' SWB because their income stay behind that of their new peers. This switch might

---

[1] The exception is Stark (1991), who analyzed the impact of relative deprivation using a very small dataset.

then reduce the initial gains in SWB due to migration particularly when the economic conditions in the origin and destination contexts differ significantly, such as in Eastern and Western Germany in the years following reunification.[2]

This study aims to fill at least some of the gaps in the literature. Our theoretical framework starts from Easterlin's paradox (1974; 2001; 2005), suggesting that gains in happiness associated with income growth decay rapidly over time, due to adaptation to the income effects of migration, which are connected with social comparison and relative deprivation theory. The hypotheses that we formulated from these theories indicate the extent to which the change in SWB associated with migration can be explained by adaptation, social comparison, and the level of integration or relative deprivation in the old and new situation. We use seventeen waves of the SOEP data, which contain information on the migrants' situation before and after relocation and on the native population in the countries of origin and destination. We estimate random- (RE) and fixed-effects (FE) panel regression models, to assess the effects of time-constant (personality traits in RE-specification) and time-varying (reference group, relative income in both specifications) causal factors. By including information on the "Big Five" personality traits, we eliminate in the RE-models the effects of genetic or hereditary factors for which we correct econometrically in the FE-specification. The paper addresses the following questions: 1. How does SWB change due to migration from Eastern to Western Germany? 2. To what extent is the change in SWB affected by social comparison and adaptation? 3. To what extent is the change in SWB affected by migrants' relative 'success' or level of integration and relative deprivation in the destination country?

3. Theoretical framework

The existing theoretical frameworks provide contrasting evidence on the effect of migration on SWB. Most of the migration literature suggests that when people make their migration decisions with sufficient information and without unrealistic expectations and when both monetary and non-monetary costs and gains are taken into account, only those profiting from migration will migrate (Sjaastad 1962). This reasoning follows standard economic theory in which it is assumed that the migration decision is subject to rational choice: individuals make

---

[2] In 1991, the gross domestic product (GDP) of the new federal states, excluding Berlin, accounted for only seven percent of the GDP of united Germany (eleven % if East and West Berlin are included) while comprising approximately one third of the territory and about one fourth of the population. In the past fifteen years, GDP rose by only five percentage points to a level of twelve percent (fifteen percent if East and West Berlin are included). These calculations are based on data from the Federal Statistical Office and the Statistical Offices of the Länder. Also the income levels in East Germany are until today around 25% lower than in West Germany (see Statistisches Bundesamt 20 Jahre Deutsche Einheit, Statistisches Bundesamt, Wiesbaden 2010 p. 48).

their decision by comparing the discounted value of future costs and gains of migration. Following up on De Jong et al. (2002), the rational choice hypothesis suggest that migrants will report higher SWB after the move than before (for a detailed discussion see: Melzer 2011a). The rationality of the individual's decision, hence, implies that the migrants will be better off after migration. Two different mechanisms might determinate the assumed positive relationship between migration and SWB. First, the higher income in the destination country might generate increases in SWB for example by allowing people to have higher living standards. Second, there might be a selection process involved. People who migrate might differ from the average population because they for example value money more and thus benefit more from the migration than other persons would do facing similar income increases. However, migrants' aspirations and expectations might not be realized, due to imperfect information or unexpected changes in conditions causing a misperception or miscalculation of future pay-offs, resulting in a decline of SWB. Moreover, the expected relationship between migration and SWB might not be as simple as claimed in the standard economic framework but more complicated, as suggested in the behavioral economics, sociological and psychological literature. One example might illustrate this. If the decision to migrate is also affected by social (loss of social capital) or cultural factors (loss of cultural identity) as suggested in the sociological literature, the utility gains derived from increases in income after migration will be reduced by the utility losses associated with the losses of social capital and cultural identity (Schnittker 2008; Powdhavee 2008).

3.1 Adaptation

The economic literature suggests a weak relationship between income increases and happiness gains. This relationship called the Easterlins' paradox has been described as one of the best established results in research on SWB (Easterlin 2001), and has been confirmed for most Western societies (Layard 2005). One of the best examples of this paradox is Japan, where despite a long-lasting and immense economic boom in the mid-1980s and 1990s, life satisfaction did not increase (Easterlin 2005). Another extreme example is the US during the 1990s, where happiness declined even though the incomes have risen (Blanchflower and Oswald 2004b). Despite general support for Easterlin's paradox (1974; 2001; 2005), a few studies report contrasting evidence (as e.g., Stevenson and Wolfers 2008). Analyzing the period between 1940 and 1970, Davis (1984), Rodgers (1982) as well as Smith (1979) found a weak but significant increase in SWB in the US, which could be associated with increasing incomes. Another exception of particular importance for our research concerns the change in

SWB in Eastern Germany after reunification, providing evidence of a lasting positive relationship between income change and life satisfaction in Eastern Germany between 1991 and 2002 (Frijters, Haisken-DeNew, and Shields 2004).

Easterlin's (1974; 2001; 2005) thesis was based on the well-documented fact (see e.g., Stanca 2010) that the relationship between income and happiness is weaker in wealthier countries. The explanation Easterlin himself provided for the paradox pertains to the effects of adaptation (Clark, Frijters, and Shields 2008, p.104). Persons usually adapt to new stimuli, such as a rise in income, implying that their SWB will return rather quickly to its original level (Scitovsky 1992). These adaptation effects are framed in the literature with the statement that we are all on a "hedonic treadmill".[3] With respect to migration the *adaptation hypothesis* suggests, that migrants adapt rather quickly to their higher incomes after migration and experience no significant gains in SWB.

3.2 Social Comparison

Easterlin's (1974; 2001; 2005) paradox is sometimes interpreted by assuming that after a certain income threshold that is necessary to satisfy basic needs, the main force driving the relationship between happiness and income is not absolute income but the individual's relative position within the income distribution (Headey, Muffels, and Wagner 2010; Headey, Muffels, and Wagner 2011). Persons compare themselves to others (c.f. Veenhoven 1991) and experience gains in happiness only if their income gains are larger than others'. Individuals compare themselves to people whom they regard as similar, in other words, to 'people-like-me' (Clark, Frijters, and Shields 2008 p. 106f). However, there are different opinions about who the 'people-like-me' actually are. Some studies have proposed a comparison with individuals of the same social class (Veenhoven 1991 p. 4); persons with the same education (Ferrer-i-Carbonell 2005), employment (Clark, Frijters, and Shields 2008 p. 106f.), or employer (Brown, Gardner, Oswald, and Qian 2008); persons of the same age (Ferrer-i-Carbonell 2005; Firebaugh and Schroeder 2009; Veenhoven 1991 p. 4) sex (Ferrer-i-Carbonell 2005); or people who live nearby, including neighbors (for a literature review see: Clark, Frijters, and Shields 2008 p. 106f.; Firebaugh and Schroeder 2009; Knight and Song 2006). Few studies use colleagues as a comparison group (Clark, Frijters, and Shields 2008 p.

---

[3] Headey (2010) points out that there are at least six theories that are based on the same idea of adaptation but are known by different names: the set-point theory of Lykken and Tellegen (1996); the adaptation level theory of Brickman and Campbell (1971), which is also used by Easterlin (1974; 2001; 2005); the dynamic equilibrium theory of Headey and Wearing (1989; 1992); the multiple discrepancies theory of Michalos (1985) and the homeostatic theory (Cummins 1995).

108). An exception is Brown et al. (2008), who used employer-employee data and showed that individuals whose wages rank higher within a firm's income distribution are more satisfied. Until recently, there was no research to answer the question of who constitutes individuals' comparison group (an expectation are: Knight and Song 2006). Therefore, it is not surprising that most studies have just assumed a reference group (Clark and Senik 2010), which was usually defined geographically (Firebaugh and Schroeder 2009; Luttmer 2005). However, Senik (2009) showed, based on a cross-country comparison of 25 post-transition countries, that individuals usually compare themselves with colleagues and former schoolmates (see also: Clark and Senik 2010). Relying on this research, we use colleagues as our reference group. The main idea is that the increase in the reference group's income over time lowers the individual's relative position within the reference group. In general, the social comparison framework predicts a decrease or increase of the individual's SWB resulting from a rise or fall of the reference group's income, respectively. The reference group, however, is likely to change due to migration because migrants will increasingly compare themselves with their new peers after relocating rather than with their former peers.[4] Because migrants move to a wealthier context their relative income should be lower after migration than it was when they were earning less but compared themselves to their former peers in a less prosperous country. This change in comparison group is likely to lead to downward adjustments of their reported SWB.[5] The *social comparison hypothesis* therefore predicts a reduction of the gains in SWB after migration. The extent to which SWB will decrease depends on the level of economic integration in the new context. The better integrated they become the more likely it is that they change their comparison group as well and compare themselves with the colleagues in the new society which will then reduce their gains in SWB. The lower the level of economic integration, the worse migrants fare relative to others in the new context and the more relatively deprived they will be and hence, the lower their SWB gains.

3.3 Relative Deprivation

Runciman developed one of the first approaches to account for relative deprivation (1966). According to him people compare their own living standard as measured by the possession of consumption goods with that of other people in their reference group. People feel deprived

---

[4] The change of the reference group of migrants is similar to the change of the reference group of people whose incomes increase and who then compare their incomes with those of even richer persons.

[5] In the economic literature, Stark (2006) describes such a change of reference group that occurs when people assimilate into the new society. According to the author, such assimilation is more likely when the sending and receiving societies are similar.

when they want a good that others have but that they themselves cannot afford (Quinn 2006). Runciman's relative deprivation concept (1966) is based on a subjective interpretation of social comparison whereas Sen's income deprivation concept (1983) stems from a more objective interpretation of relative deprivation (Muffels and Headey 2011). Sen's income-based definition of relative deprivation resembles the notion of relative deprivation as used in the migration studies of Stark and coauthors (Stark 1991; Stark and Bloom 1985; Stark and Taylor 1989). The subjective interpretation of relative deprivation by Runciman is already captured in the notion of social comparison explained in section 3.2. Therefore, contrary to the social comparison approach, which refers to people's subjective position, the income-based relative deprivation approach, that will be used here, concerns people's objective income position within the new society. In Sen's income deprivation approach (1983), people are ranked according to their position in the income distribution. We now assume that the better integrated migrants are and the lower their (objective) level of relative deprivation is in terms of income or consumption the higher their SWB is. The relationship between relative deprivation and migration is bidirectional. On the one hand, relative deprivation in the origin country might cause migration. Persons who are unsatisfied with their income ranking might consider migration as a solution to improve their income position (Liebig and Sousa-Poza 2004; Stark 2006). On the other hand, due to reverse causality, migration might cause relative deprivation because people's relative income position might worsen in a new and richer society. The period of reunification after 1989, with the implementation of Western German policies (e.g., family-based taxation) and the privatization of the economy, was associated with significant changes. Two-thirds of Eastern Germans changed jobs or became unemployed by 1996 (Matthes 2004). The rising income inequality in Eastern Germany was accompanied by larger proportions of extremely rich and extremely poor people. Those changes, at both the individual and societal levels, might have caused relative deprivation and might have created the desire to migrate. However, as already mentioned, migration to the wealthier Western Germany with more income inequality (Statistisches Bundesamt 2004, p.627ff) might also cause relative deprivation. Persons who migrate to increase their absolute income might overestimate their income gains and underestimate the costs related to lack of integration in the destination country. Migration might turn out to be less gainful than anticipated. The more expectations remain unrewarded, the worse migrants integrate in the new society, and the higher their level of relative deprivation becomes, thereby reducing their SWB. Thus the *relative deprivation* hypothesis suggests that the less integrated people are and the worse their relative position in the society is the lower their SWB will be and vice versa.

The three described mechanisms, adaptation, social comparison and relative deprivation will determinate to a high degree the overall effect of migration on SWB. Especially, social comparison and integration or relative deprivation, might counterbalance each other. Social comparison might reduce the integration effect because migrants who become more economically integrated are more likely to compare themselves with their new peers in West Germany, who are still faring better than the migrants, thereby reducing their gain in SWB. The less integrated and more deprived migrants are, the more they are likely to compare themselves with their former peers, mitigating the decline in SWB due to deprivation. In the end, the effect on SWB depends on which effect dominates: the positive effect of integration or the negative effect on SWB caused by social comparison.

The hypotheses predict, respectively, a positive effect on SWB (*rational choice*), an unspecified effect that depends on how well migrants integrate economically (*relative deprivation*) and a positive initial effect that declines rapidly due to *adaptation* and *social comparison*. Empirical research is needed to determine which of these effects prevail.

4. Data and Methods

4.1 Data

The data come from the German Socio-Economic Panel (SOEP) Study, covering the waves of 1990 to 2008. The SOEP is a representative longitudinal survey of private households that started in West Germany and West Berlin in 1984. In 1990, the sample was extended to include the former GDR (Wagner, Frick, and Schupp 2007). The sampling procedure is based on a random selection of households; within a household, every household member over 16 is surveyed. The SOEP data provide information from repeated interviews with each individual. We use the unbalanced sample of persons from Eastern and Western Germany over the nineteen-year period from 1990 to 2008. Some population groups, such as young people, immigrants and singles, are less likely to be interviewed over the entire period and more likely to miss a wave. Relying on an unbalanced sample reduces possible selection bias and includes a more heterogeneous population at risk of migration in the analyses.

All sample members who left Eastern for Western Germany or vice versa between 1990 and 2008 are identified as East-West or West-East migrants, respectively. Migration is defined as a transition into the other part of Germany from one wave to the next; therefore, the first and last waves are removed from the sample and the actual estimations are based on

seventeen transition years. Many studies suggest different adaptation patterns for men and women in response to major labor market events, e.g., unemployment and layoffs (e.g., Clark, Diener, Georgellis, and Lucas 2008), and migration also influences SWB in a gender-specific way (Melzer 2011a). Therefore, we conducted all analyses separately for males and females.

The major advantage of the German SOEP data is that migrants are followed from one part of Germany to the other. After the move, individuals are still interviewed on a yearly basis. The questionnaires for Eastern and Western Germany are identical. Thus, the data allow a direct comparison of migrants' situations before and after the move with the situation of the representative native populations in the regions of origin and destination. After selection, the dataset contains 175,247 person-years and information from 18,545 persons aged between 18 and 63 years, including 461 East-West migrants and 277 West-East migrants. We have information on 5,562 person-years for East-West migrants, of which 2,754 are from the periodafter relocation. For persons moving from West to Eastern Germany, the dataset contains 3,317 person-years, of which 1,554 are from the period after relocation.

Among East-West migrants, we have information on 40% of males and 38% of females who reside in Western Germany for more than five years and on 17% of men and 16% of women who reside for more than nine years. The information available for West-East migrants show shorter stays; 33% of males and 29% of females stayed in Eastern Germany for longer than five years, and only 8% of males and 7% of females stayed for longer than nine years.

4.2 Our measures

Dependent variable

The dependent variable SWB is operationalized by the following question: "How satisfied are you with your life, all things considered?" The respondent could answer on a 0 to 10 integer scale, where 0 represents the lowest level of life satisfaction and 10 the highest. Research from psychology and economics validates the theoretical basis for the measurement of SWB, showing, for example, that self-reported life satisfaction correlates strongly with the judgments of others or with the individual's appearance (e.g., duration and honesty of smile) and body language (e.g., heart rate) (Blanchflower and Oswald 2004a; Di Tella and MacCulloch 2006; Frey and Stutzer 2002; Kahneman and Krueger 2006). The eleven-point scale is treated as a cardinal scale following Blanchflower and Oswald (2004a), who showed

that ordinal-logit models and OLS regression provide largely similar results, even for three-point scales.

Independent variables

Migration: A migration dummy variable *"migrated from Eastern to Western Germany"* is included to measure the effect of the migration decision on SWB, and takes the value one if an individual relocated from Eastern to Western Germany and zero otherwise. The second migration variable *"migrated from Western to Eastern Germany"* controls for return migration and takes the value one for persons who relocated from the West to the East and zero otherwise. Persons who migrated from the East to the West and then returned to the East change from East-West to West-East migrants.

Income: To analyze the impacts of adaptation, social comparison and level of relative deprivation or integration on SWB, a range of variables measuring income in absolute and relative terms are included.

Adaptation is indicated by two income variables, the current year's and last year's monthly absolute income, that capture the individual's labor income from his or her main job. We take the logarithm of deflated[6] income as the relationship between single-unit increases in income and increases in SWB decreases marginally (c.f. Firebaugh and Schroeder 2009).[7]

To account for *social comparison* effects, we included *reference group or colleagues' income,* defined as the average income level of the reference group of persons of the same age, defined as persons age plus minus three years, (c.f. Clark and Senik 2010) and with the same current (for employed individuals) or last occupation (for non-employed individuals), as indicated by the ISCO88 two-digit code.[8] To account for different comparison processes for the duration of residence in Eastern and/or Western Germany, we estimated the reference group or colleagues' income separately for the Eastern and Western samples. Thus, the variable *"Eastern German reference group or colleagues' income"* has non-zero values only for persons who resided in Eastern Germany at least once, including those who migrated to Western Germany. Similarly, the variable *"Western German reference group or colleagues'*

---

[6] Incomes are measured in constant 1992 prices. We use imputed income as generated by the SOEP team based on longitudinal and cross-sectional imputation. The income variables are missing for approximately 10 % of the sample.

[7] Although this practice is common in economics and sociology, it might be problematic because deviations of the income from the log-linear distribution and breaks in the income distribution are eliminated (c.f. Clark, Frijters, and Shields 2008, p.115). The logarithm of the deflated current income is also taken as the basis for all other variables based on income, such as the reference group or colleagues' income.

[8] Never-employed people and students are combined in a separate group.

income" has non-zero values only for persons who resided in Western Germany at least once, including those who moved to the East.

Increase and decrease in the relative income position indicated by the individual's percentile rank in the income distribution: The extent to which people's relative income position changes after migration is assumed to indicate the level of integration or relative deprivation in the new society. Because migrant labor is considered 'cheap labor' in many countries, we expect higher levels of deprivation among migrant workers in low-wage jobs. This deprivation would yield a nonlinear relationship between migrants' income and SWB. People without own income are assigned zero incomes. The percentile rank for each individual may change every year. When an increase or decrease occurs, the relevant variable displays the number of percentage points by which the person's ranking changed. To measure the differential impacts of income rank and changes therein before and after migration, we created interactions between these income variables and the East-West migration dummy explained earlier.

Controls

The analyses control for a range of individual characteristics that are known to be important correlates of SWB, including age, age squared[9], subjective health, or important determinants of the migration decision itself, such as employment status and marital status. People migrate for various reasons. For example, unemployed persons living in the East may have acquired new jobs in the West. Migration decisions are often made jointly within the household context. If the head of the household migrates, the partner and the children are likely to follow, either simultaneously or later. We therefore include household composition variables to control for the effects of family composition changes over time (variable *"household type"*). People also migrate to union with a new partner, for which reason we include the variable *"found a partner"* that accounts for this. The increase in SWB after migration might then be unrelated to the migration decision itself but caused by a change in marital or employment status, and the results would therefore be biased. We also control for the economic situations in Eastern and Western Germany using gender-specific unemployment rates for each region. Following set-point theory, which claims that genetic factors indicated by personality traits explain almost half of the variation in SWB, we control for the so-called "Big Five" personality traits (Lykken 1999; Lykken and Tellegen 1996) in the RE-models.

---

[9] For a recent analysis of the importance of age on the SWB see Yang (2008).

The information on the descriptives and the operationalization of the control variables is presented in the Annex.

4.3 The empirical model

We now formulate the empirical regression model for explaining SWB:

$$
\begin{aligned}
SWB_{it}^{mg} = {} & \alpha_1 EastWest_{it} + \alpha_2 WestEast_{it} + \delta_1 Z_{it} + \delta_2 C_{it} \\
& + [A^y(\lambda; \ln Y_{it}) + \gamma_2(\ln Y_{it}^{rg}) + \gamma_3(\ln R_{it} - \ln R_{i(t-1)})] \\
& + [A^y(\lambda; \ln Y_{it}) + \gamma_5(\ln Y_{it}^{rg}) + \gamma_6(\ln R_{it} - \ln R_{i(t-1)})] * EastWest_{it} + \mu_i + \varepsilon_{it}
\end{aligned} \tag{1}
$$

The dependent variable *SWB* (operationalized as life satisfaction) is observed for respondent *i* at time point *t,* where *t* ranges from 1991 to 2007. α_1 and α_2 measure the respective impacts of East-West and West-East migration on SWB. *δ_1 and δ_2* measure the effects of observable time-varying controls indicated by the vector Z_{it} and time-constant controls C_i, as for example the five personality traits. A^y is the adaptation function according to Easterlin's paradox, which, following Layard (2005), is considered a function of the adaptation parameter λ and current and lagged or past income. γ_2 and γ_3 measure how SWB is affected by the comparison with the income in the reference group and by the change in relative income position or rank, respectively. Finally, a set of interaction effects with the East-West migration dummy is included. The A^y function now represents how migrants' SWB adapts to changes in current and past income. *γ_5* and *γ_6* measure the impact of comparison income and integration or relative deprivation, respectively, on migrants' SWB. Integration and relative deprivation are measured by the change in the relative income position or in rank in the years following migration. Individual fixed effects are represented by the μ_i term capturing the time-invariant unobserved heterogeneity, and the observation-specific error term is given by ε_{it} .

In the FE-specification, only time-varying covariates are withheld because the model takes, for each dependent and independent variable, the deviation of the individual value each year from the overall mean over time. Time-constant covariates, such as sex, or personality traits cohort, are therefore removed. The model views the relationship between changes in SWB and changes in people's characteristics (such as age, household composition and absolute and

relative income) and such choices as having children, getting married or migrating. Adaptation is measured through the A^y function.

The impact of comparison income on SWB follows the specification by Layard (2005) according to which the adaptation is dependent on the current year's and previous year's income and an adaptation parameter λ. With complete adaptation, λ=1; with no adaptation, λ=0; and with partial adaptation, 0<λ<1. When λ =1 and assuming the parameter γ_5 to be positive, life satisfaction does not increase with rising income if current income grows at the same rate as last year's income. When λ=0, SWB rises with current income, and no income growth is needed to stay at the same level of SWB. In the case of partial adaptation, SWB can stay at the same level when current income grows at a slower level than last year.

$$A^y(\lambda, \ln Y_{it}) = \gamma_5(\ln Y_{it} - \lambda \ln Y_{i(t-1)}) \qquad (2)$$

By substituting the adaptation function (2), we obtain

$$
\begin{aligned}
SWB_{it}^{mg} = {} & \alpha_1 EastWest_{it} + \alpha_2 WestEast_{it} + \delta_1 Z_{it} + \delta_2 C_{it} \\
& + \gamma_1(\ln Y_{it} - \lambda \ln Y_{i(t-1)}) + \gamma_2(\ln Y_{it}^{rg}) + \gamma_3(\ln R_{it} - \ln R_{i(t-1)})] \\
& + [\gamma_4(\ln Y_{it} - \lambda \ln Y_{i(t-1)}) + \gamma_5(\ln Y_{it}^{rg}) + \gamma_6(\ln R_{it} - \ln R_{i(t-1)})] * EastWest_{it} + \mu_i + \varepsilon_{it}
\end{aligned}
\qquad (3)
$$

Estimation procedure

We use RE and FE GLS panel regression models to estimate the relationship between SWB and migration. Consequently, in the FE-specification the impact of time-invariant characteristics, such as gender or personality, on SWB can no longer be estimated, but our main interest lies in the effects of time-varying variables indicating the effects of social comparison and adaptation on SWB. The FE-model has the advantage of eliminating the impact of (time-constant) unobserved factors, such as motivation, ability and personality traits. Moreover, the FE-model controls for potential sample selection on time-invariant characteristics, which is essential for investigating the influence of migration on SWB, as migration is selective (c.f. Hunt 2006; Melzer 2011b). Finally, the FE-model permits examining the causality involved in the decision process of migration. Using FE-models, we can determine whether happy persons self-select for migration or whether migration indeed impacts SWB positively.

RE-panel regression models estimate the between and within variance simultaneously, providing additional information, on differences in the effect of migration on SWB for

various population categories, such as poorly or highly educated Eastern and Western Germans. The models allow the calculation of changes in SWB over time separately for migrants and non-migrants in Eastern and Western Germany after correcting for compositional differences. The main difference from the FE-models is that RE-models require an additional assumption regarding the structure of unobserved heterogeneity involved, assuming that the unobserved factors are uncorrelated with the explanatory factors, and this assumption might be violated. Moreover, we must control for time-invariant observed characteristics, such as gender, and for time-invariant unobserved heterogeneity, such as ability and personality. We therefore included additional time-constant controls in the models to correct for heterogeneity: the "Big Five" personality traits in the RE-models. If the major assumption is not violated, RE-panel regression models are consistent and more efficient than FE-models (Wooldridge 2009 p. 496). If the assumption is violated, FE-models are more efficient. Because we assume that migration affects SWB differently for men and women, we used separate models for men and women.

Estimation of six empirical models

We estimated six models, each for men and women separately:

Model 1: This model (estimated with both, a FE and RE specification) is the *baseline*, including all controls and the East-West and West-East migration dummies to test the main effects of East-West migration on subjective well-being while correcting for endogenous return migration (Table 1). In Models 2 to 6, the adaptation, social comparison and relative deprivation variables are added. The results are presented in Table 3 for men for women, omitting the results for the controls.

*Model 2***:** This model tests the *adaptation* to income thesis and includes all variables of Model 1 plus variables measuring the main effects of adaptation to income, social comparison and relative deprivation. We also include interaction terms between current and last years' absolute income and the East-West migration dummy.

Models 3 and 4: These models test the *comparison income thesis* and include all variables of Model 2 plus the interaction terms between relative or reference group income (social comparison) and the East-West migration dummy. Model 3 contains the interaction term of the reference group income of West Germans (new peers) with the migration dummy, and Model 4 includes the interaction of the reference group income of East Germans (former peers) with the migration dummy.

Models 5 and 6: These models test the *integration-relative deprivation thesis* and include all variables of Models 3 and 4, respectively, plus the interaction terms between increases or decreases in migrants' relative income position and the East-West migration dummy. Models 5 and 6 examine the extent to which the expected shift in social comparison group tested in Models 3 and 5 is mediated by the way migrants objectively integrate or remain objectively deprived in the new context. Models 5 and 6 differ only in the interaction term of the migration dummy with the reference group income of Western Germans (new peers) and Eastern Germans (former peers) respectively.

5. Results

5.1 Descriptive analyses

First, in Graph 1, we depict the evolution of SWB, real income and hourly wage for migrants and non-migrants in Eastern and Western Germany separately for males and females. We distinguish between East-West and West-East migrants and view the evolution from four years before to ten years after migration. For migrants, the year zero represents the year in which the actual migration took place. For non-migrants, we view the evolution in income and SWB between 1992 and 2006, setting 1996 as the base year (zero).

The graph shows that the level of SWB for migrants and non-migrants is rather stable over the entire period, except for the sharp drop before and strong recovery in the first year after migration. The drop occurs one (female East-West, male West-East), two (male East-West), or three years (female West-East) before migration but reaches its lowest level in the year of migration. Male and female East-West migrants' SWB is already before migration slightly higher than that of the Eastern population and rises further after migration. However, it does not reach the level of SWB of West Germans.

The incomes of migrants and non-migrants show a much less stable pattern than their SWB, again with a sharp level effect around migration, especially for migrating women experiencing a strong income drop before migration and a strong rise after. Migrants' earnings improve compared to what they earned in the East, suggesting that they integrate well in the West. East-West migrating men's incomes rise more strongly in the years after migration than for non-migrants. Anyhow, it takes them 8 years to outperform the West German native population. The situation is different for women. Women migrating from the East to the West have right from their first year in West Germany higher earnings than the

East and West "native" population. The high incomes result from working long hours – East-West female migrants seem to keep working the long hours they were used to in the East – combined with high hourly wages. Nevertheless, the incomes and hourly wages of all women stay far below those of men. Interestingly, though, we find higher earnings, but still lower hourly wages, among non-migrating Eastern than among non-migrating Western German women. Finally, the very strong drop for West-East migrating women after 8 years requires further scrutiny and might be caused by the low remaining numbers of respondents. The development of SWB and incomes before migration suggest that the strong drop in migrants' SWB before relocating might be caused by a preceding drop in earnings, which might cause relative deprivation, as suggested by Stark (2009). Eventually, the larger volatility of real income compared to the relative stability of SWB suggests the existence of adaptation and social comparison effects.

5.2 Model estimations

According to the FE-specification, migration from Eastern to Western Germany increases the SWB of men by 0.5 points on the SWB scale running from zero to ten with an average SWB of 6.5 in Eastern Germany (see Model 1 Table 2). For women, the effect is even stronger; migration increases their SWB by 0.7 points on average. The RE-model shows that East-West migrants have a lower SWB than the Western Germans but a higher SWB compared to the non-migrating East Germans, confirming earlier findings at the macro level showing lower life satisfaction among East Germans (c.f. Easterlin and Plagnol 2008; Frijters, Haisken-DeNew, and Shields 2004; Melzer 2011a). The RE-models display a negative effect, while the FE-models display a positive effect of migration on SWB. This is caused by the dissimilar econometric specifications and the fact, that the FE-models illustrate the causal effect migration has on SWB, while the RE-models reports differences between Eastern and Western Germans. In the FE-models the reference category consists of all non-migrating Eastern and Western Germans, whereas in the RE-models, the reference category consists of only the non-migrating Western Germans.

According to the FE-model, male West-East migrants show no significant difference in the level of SWB compared to all other Germans. For women, we find a significant negative effect. In the RE-specification, however, male and female West-East migrants display a higher SWB compared to other Western Germans. From the findings of both specifications,

we conclude that the West-East migrants appear to be a highly selective group of people with a high level of SWB, that is not (men), or even negatively (women) affected by migration.

Model 2 in Table 3 tests the *adaptation* thesis. This model analyzes the impact of the current year's and last year's absolute income (adaptation) on migration. It appears that the higher one's current earnings are, the higher one's SWB is, though the effects are rather small and stronger for men than for women.[10] An increase in absolute income by 1 percent point increases the SWB by 0.05 percent points for men and 0.02 percent points for women. The effect of lagged absolute earnings (0.01 for men and -0.01 for women) is even smaller. For men the positive coefficient of the lagged income indicates that the level rather than the growth is decisive for SWB. For women the actual growth is more important than the level for SWB. The East-West migration dummy however, loses some of its magnitude and for men turns insignificant with inclusion of the interaction terms with the adaptation *income variables*. This indicates that some, but not all of the increase in SWB due to migration is caused by an increase in income. The interaction effects with absolute income show no significant effect on male migrants' SWB. Male migrants gain no more satisfaction from higher absolute incomes than non-migrants would have gained from a similar income increase.[11] Female migrants, in turn, gain compared to non-migrants additional satisfaction from the increase in absolute income associated with the migration from East to West Germany. However, this relationship has to be interpreted very carefully as the effect loses its significance in the fixed-effect specification, when additional interaction terms are included.

The effects of relative or comparison income indicated by the reference group or colleagues' earnings displayed in Model 3 and 4 are much more pronounced than the absolute income variables, both, for men (-0.142) and for women (-0.107). They show that the higher the reference group income is, the lower one's own SWB. If the colleagues' income increases by 1 percent point while own income remains stable, the SWB of men and women declines by 0.14 and 0.11 percent points, respectively. [12]

---

[10] To test the robustness of our results, we also used other sources of income information in the data (log net earnings resulting only from employment and log net income in the month prior to the interview) to calculate the various income variables (absolute income, last year's absolute income, Western and Eastern German colleagues' income and the decline or increase in the relative income position) including their interactions with the migration dummy. These models provide similar results. Moreover, we have estimated the models again but now excluding the first or the last wave of the dataset and also these estimations did not change the results.

[11] Instead of only relying on the displayed models, we estimated additional models where the interaction terms were included in the models separately or in varying order. We found no significant differences in the magnitude or the significance levels of the interaction terms. We also estimated RE-models for all FE-specification, which produced similar results.

[12] Because we take the logarithm of income, a one percent point increase in income leads to a x percent point change in SWB where x equals the size of the parameter (see Wooldridge 2009, p.43).

The interesting question is how large the combined simultaneous increase of the own and the colleagues income actually is. An increase of own and colleagues' incomes by 1 percent point reduces the SWB of Western German men by 0.09 percent points[13] and that of Western German women's by a small 0.04 percent points. The combination of these two effects provides an explanation for Easterlin's paradox (1974; 2001; 2005). Apparently, people only gain additional SWB due to a higher income when the incomes of the reference group remain stable. When the increase in the own income is accompanied by an increase in the reference group income, people seem to end up even less satisfied.

Recent research indicates that Eastern Germans' SWB is affected less negatively by the income increases of people they compare themselves with (Frijters, Haisken-DeNew, and Shields 2004). We therefore included an additional variable that indicates whether Eastern Germans' SWB is differently affected by the income increases of their colleagues compared to Western Germans. We find a small negative, but no significant (0.03) deviance from the influence of the colleagues' income on SWB for East German men. However, East German women react positively (0.13 percent points) to a 1 percent point income increase of their colleagues, even when their own income remains stable. A simultaneous increase in own and the colleagues' income of 1 percent point leads to an increase in SWB by 0.04 percent points. The fact that women gain additional satisfaction, and that men experience only relative small dissatisfaction,[14] from the income increases of their colleagues, might explain why Eastern Germany was one of the countries that deviated from Easterlin's paradox and why an 'atypically' positive effect of a general income increase is found by Frijters et al. (2002).[15]

The interaction terms included in Model 3 and 4 tell us whether migrants' SWB is more strongly affected by the comparison with their new (Model 4) or former colleagues' income (Model 5) compared to non-migrants. Male migrants gain additional dissatisfaction from the income comparison with their new and former colleagues compared to non-migrants. An increase in the incomes of the new Western German colleagues by 1 percent point decreases the satisfaction of male East-West migrants by 0.468 percentage points, which is a notably strong effect. A similar increase in the incomes of their former Eastern German colleagues

---

[13] Own income increase by 1 percent point (0.05) minus reference group income increase by 1 percent point (0.140)=-0.09.

[14] Own income increase by 1 percent point (0.05) minus reference group income increase by 1 percent point (0.14) plus the effect for Eastern Germans reference group income increase (0.03)=-0.06.

[15] One explanation, for this 'atypically' rises in SWB was the rise in income in the period from 1990 to 2002. The wages rose in this period with around 30 percent with the largest increase observed in the first five years. This increase was not justified by the growth in the East German productivity level and was mainly driven by the power of the labor unions and the fear of mass migration to the West (Hunt 2006). The increase in income was accompanied with solidarity payments to the East German communes, enabling them to invest into the infrastructure, which might also have had some impact on the subjective well-being of the East Germans.

decreases migrants' satisfaction by 0.552 percentage points, a much stronger effect than for the non-migrating population. The effect of comparison income with respect to their old peers, the East German colleagues, seems to be slightly stronger; however, the difference is statistically insignificant. The effect for women is also negative, but very small and insignificant. For women the interaction effects of comparison income with migration for both the new and the former colleagues is positive, but small and insignificant.

More importantly, for men Model 3 and 4 (Table 3) also show that controlling for comparison income effects, the main effect of the migration dummy more than doubles in size compared with the dummy effect in Model 1. In the same way, in which the adaptation effects seem to increase the magnitude of the migration effect, the comparison income effects appear to suppress and strongly reduce the positive effect of migration on migrants' SWB, when not controlled for. In Model 2, for men, where we control only for the interaction of adaptation income with migration, the negative influence of social comparison with the West-Germans colleagues, suppresses the migration effect so strongly, that it turns insignificant. When we control for the interaction of comparison income with migration (Model 3 for men) the migration dummy becomes strongly significant again. Comparing the findings in Model 2 with the findings in the social comparison Models 3 and 4, it is shown that the adaptation and social comparison mechanisms have reverse effects on SWB and that they partly cancel each other out.

The results for women are very different and show that when we only control for the interaction of adaptation income with migration (Model 2) the migration dummy is reduced due to comparison income effects, but it remains strongly significant. However, after correcting for the interaction of comparison income with migration (Model 3 for females) the positive effect of the migration dummy turns insignificant. Hence, women gain in SWB from migration only because of the small positive effects of adaptation and comparison income on their SWB associated with migration. The reason is that female migrants perform relatively well in income terms compared to their income before migration and compared to the incomes of their new colleagues and peers.

The results for men are in line with the findings of Bartram (2010), who explains the lower SWB of migrants from poorer developing countries by their inability to gain higher incomes in the destination country and the resulting income deprivation. As the average income is much higher in the West than in the East (SOEPmonitor 1984-2007 2008), the higher earnings of Western German colleagues reduce the SWB of male migrants. Moreover,

migrants are a highly selective group: they are more educated than the remaining population in Eastern Germany (Hunt 2006; Melzer 2011b).

The comparison based on the average incomes of these groups underestimate the true income differences. Therefore, we used a matching technique to be better able to compare the incomes and working hours of migrants with persons living in Western Germany with similar education and labor market experience (see: Iacus, King, and Porro 2011). Table 1 reveals that male Western Germans with similar characteristics earn not only €89 more per month, but that male West Germans with similar characteristics earn on average €173 more per month than male East-West migrants. This makes our findings on the suppressing effect of comparison income on migrants' SWB rather plausible.[16]

Models 5 and 6 in Tables 3 test the integration/relative deprivation hypothesis. In these models, we add the variables indicating an increase (integration) or decrease (relative deprivation) in income rank. Interestingly, all the interaction terms turn out to be insignificant for males and females. The small effects of the integration/relative deprivation indicators become also obvious, as none of the effects already included in Model 3 and 4 changes significantly. This finding indicates that the change in SWB after migration for both, men and women, is mainly affected by adaptation and social comparison effects, not by changes in the levels of economic integration or relative deprivation.

5.3 Simulation results

Graph 2 depicts the simulated adaptation, social comparison and relative deprivation effects on SWB for males and females separately and shows the average effects of migration for East-Western migrants compared to non-migrating Eastern and Western Germans based on the fixed-effects Models 2, 3, and 5. To account for the precise effect on adaptation, social comparison and relative deprivation and to separate the direct effects from the mediating effect those variables have on the migration dummy, we estimate in each case two models.[17] In the incomplete models (always displayed in grey) we set the adaptation (first and fourth graph), comparison (second and fifth graph) and deprivation (third and sixth graph) effects and its interaction terms at zero pretending that for example adaptation has no direct effect on

---

[16] A similar pattern can be found for West-East migrants.
[17] Technically, it means that the estimated SWB for migrants in each of the Models 2,3 and 5 presented in Table3, refer to the situation before and after migration whereas for non-migrants it represents just the average SWB over time.

migrant's SWB. The black lines, in turn, depict the simulated effects as derived from the models with the effects and interaction terms included and set at the respective group's means. Thus, the gap between the grey and the black lines displays the direct effect of adaptation, social comparison and relative deprivation on the East-West migrants and the non-migrating population. The shift of lines, as can be observed best by comparing the first and second graph after migration, shows, in turn, the mediating effects social comparison has on SWB, which can be also seen by the increase of the migration dummy, when we compare Model 2 and 3. The SWB level differences in the second graph indicate, how much social comparison suppresses the influence of migration on SWB, when we don't control for it. The main advantage of these Graphs is that they display the average effects on the SWB (main effects plus interaction effects) of East-Western migrants before and after migration in comparison to non-migrants. The third shows that for both, male and female migrants the effects on SWB of income rises associated with migration are positive and slightly higher than the effects of income rises on the SWB of non-migrants. For male migrants the total negative effect of adaptation to rises in income on SWB accounts to 0.2 points of the scale ranging from zero to ten before migration, which is illustrated by the difference between the grey and the black dashed line. After migration the average negative effect of adaptation on SWB increases to 0.4 points which is a rather large effect. The simulated results show how large the effects on SWB displayed in the Table 3 indeed are. This might seem surprisingly at first, but also the income rise associated with migration is rather exceptional. For example, for male East-West migrants, the average monthly income nearly doubles after migration from €1,264 to €2,402 (Table 1).

Model 3 in Table 3 displayed in the second graph to the right show the comparison income effects, which reduce male migrants' SWB strongly. For East-West migrants before migration and non-migrants, the comparison income effect is relatively small; SWB is reduced by 0.2 points on average. However, after migration, the effect increases strongly; comparison income effects reduce the SWB of East-Western migrants by 0.6 points. Moreover, when the first and second graph are compared, it becomes obvious that in the first much lower SWB levels are observed for male migrants after the move than this is the case in the second graph. When the models do not control for the negative effect of social comparison income on SWB, the positive effect of migration is underestimated since it also takes up the negative effect of comparison income on SWB. The migration dummy is therefore biased downward (Wooldridge 2009, p. 91ff). The strong negative effect of social comparison suppresses the

positive effect of migration as shown by the much stronger effect of the migration dummy when the comparison income variables are included in Model 3.

For women, the comparison of the fourth and fifth graph shows exactly the opposite; the social comparison effect increases the SWB of migrants, even though the effect is very small. For female migrants, the social comparison effect increases SWB on average by 0.05 points before and 0.1 points after migration.

The relative deprivation effects are also displayed in Graph 2. The simulated SWB levels in the models with and without relative deprivation are notably similar. These findings indicate that migrants are less concerned with their absolute income rises than with their relative income position compared to their colleagues or peers. This result offers support, as already pointed out, to the reference group thesis and supports the Easterlin paradox because it shows that comparison income effects are apparently rather strong.

6. Conclusions

In this paper, we examined the impact of adaptation, social comparison and relative deprivation on the change in SWB associated with moving from Eastern to Western Germany after the German reunification in 1989. The reunification acts as a 'natural experiment' and provides a unique opportunity to analyze the impact of migration on SWB using longitudinal data. The theoretical framework consists of economic (rational choice), psychological (set-point theory and social comparison) and sociological (relative deprivation) theories to examine the impact of migration on SWB. Following these theories, we have developed various hypotheses on how these theoretical effects affect the relationship between migration and SWB. We used nineteen waves of the German SOEP panel data 1990-2008, which contain information on migrants before and after relocating and non-migrants. We estimated FE-and RE GLS panel regression models to examine long-term changes in SWB associated with migration between Eastern and Western Germany.

We were able to bridge two lines of research focusing on migrants' SWB either by comparing migrants' SWB to those of the new Western colleagues and showing a negative effect of migration, or on analyzing how migrants' SWB compares before and after the move showing a strong positive effect. The different lines of research have provided a contrasting picture of the effects of migration on SWB. We show that migration has lasting, positive effects on SWB without closing entirely the gap with the SWB of the new colleagues or peers. Migrants from Eastern Germany start at low levels of SWB, which they improve by

migration, but they usually remain less satisfied with their lives compared to Western Germans who do not migrate. That result is also the reason why the two lines of research provide such different results: they both constitute just one part of the puzzle.

Analyzing evidence on the impacts of adaptation, social comparison and relative deprivation on migrants and non-migrants SWB, we provide an explanation for the Easterlin paradox. People compare themselves with their colleagues and gain dissatisfaction from an increase in their peers' incomes. Even substantial but common increases in absolute income do not improve SWB. Our findings could therefore help to explain why in most of the western societies the satisfaction level remained stable despite economic growth. But we find also an "atypical" pattern for East German women, who indeed gain more satisfaction from a general income increase, supporting the findings of Frijters et al.(2002), who found a positive relationship between increases in real incomes and increases in SWB in Eastern Germany in the period from 1991 to 2002.

Our results suggest that adaptation, social comparison and relative deprivation effects are important aspects of changes in SWB associated with migration. Migrants compare their earnings with those of their new colleagues after migration to the West. The comparison with their new and former colleagues adversely affects especially the SWB of men and strongly suppresses the positive effect of migration on SWB per se. Male migrants experience more dissatisfaction from the comparison than non-migrants. The evidence that male migrant earnings are below those of their new West German male colleagues help to explain the strong and negative impact of comparison income on SWB. The simulation results also indicate that female migrants' SWB is, in turn, unexpectedly, positively affected by adaptation and social comparison. Women migrating from East to West Germany earn soon after their arrival on average more than West German women, even when this is below that what West German women with similar characteristics would earn (see Table 1).

Therefore, our results support Easterlin's and especially Layard's arguments that subjective well-being is a relative concept, meaning that any improvement in SWB is very much dependent on how other people fare in the immediate social context. 'Keeping up with the Joneses' appears to be a strong sentiment, particularly among male migrants. More research is however needed to understand why this effect shows up so strongly for male but not for female migrants. One reasonable hypothesis might be that women gain less from migration per se since they lose more in terms of SWB from the loss of social capital than men do, because they attach more value to it than men. The contrasting findings for men and women seem to be a very interesting subject for further scrutiny.

When people migrated from the East to the West during the 1990s and early 2000s, they seem to have made, at least partly, a rational choice by being able to improve their labor market position and hence increase their earnings and living standards. A large part of the income rise however leaks away and does not result in increases in SWB due to habituation or adaptation effects. Adaptation to higher incomes increases the male migrants' SWB by only 0.4 points and females by 0.2 points. Moreover, migrating women seem to profit more from the income increases associated with migration than non-migrating women. Migrants usually experience losses in SWB (and income) in the years before migration, which suggests that relative deprivation might, as Stark et al. (2009) suggested, motivate migration. The gains in SWB, though, of migration are mediated by the extent to which migrants are able to integrate into the new society by making a career and improving their relative income position. Interestingly not the absolute income rise matters for migrants' SWB but how well they fare in comparison with their peers. Most migrants gain happiness from migration. Women, who fare better than their new peers in Western Germany, experience a small gain in happiness especially from comparison income but gain hardly from migration per se, possibly due to loss of social capital. For men a substantial part of the gain in happiness due to migration disappears associated with the negative effects of social comparison with their new peers' incomes.

The present study yields useful information about the effects of adaptation, social comparison and relative deprivation on the relationship between migration and happiness, but leaves several unanswered questions. The positive effects of the migration decision on SWB found here might be biased in terms of how migrants fare in terms of changes in SWB or happiness when moving to a completely different social, economic and cultural environment. Even though the two regions were formally different countries for a long time, they had previously shared a common cultural background. Migrants normally consist of very heterogeneous groups originating from highly different cultural backgrounds, whereas the migrants in this case are notably homogeneous. The results might change and become much more diverse if a more heterogeneous group was observed.

The analyses were performed for men and women separately and while showing similar patterns, they also convey strongly dissimilar causal effects. This issue needs more scrutiny. Eventually, reference group behavior has been constructed from the data but might better be based on people's answers to questions about the group to whom they compare their income. Including questions in the SOEP questionnaire would enrich future analyses on

reference group behavior not only with respect to migration but also with respect to other economic and social choices.

7. References

Amit, Karin. 2010. "Determinants of Life Satisfaction Among Immigrants from Western Countries and from the FSU in Israel." *Social Indicators Research* 96:515-534.

Bălţătescu, Sergui. 2007. "Central and Eastern Europeans Migration' Subjective Quality of Life. A Comparative Study." *Journal of Identity and Migration Studies* 1:67-81.

Bartram, David. 2010. "Economic Migration and Happiness: Comparing Immigrants' and Natives' Happiness Gains From Income." *Social Indicators Research*.

Blanchflower, David G. and Andrew J. Oswald. 2004a. "Money, Sex and Happiness: An Empirical Study." *The Scandinavian Journal of Economics* 106:393-415.

Blanchflower, David G. and Andrew J. Oswald. 2004b. "Well-being over time in Britain and the USA." *Journal of Public Economics* 88:1359-1386.

Brickman, Phillip and Donald T. Campbell. 1971. "Hedocic relativism and planning the good society " in *Adaptation level theory: A symposium*, edited by M. H. Appley: Academic Press.

Brown, Gordon D. A., Jonathan Gardner, Andrew J. Oswald, and Jing Qian. 2008. "Does Wage Rank Affect Employees' Well-being?" *Industrial Relations* 47:355-389.

Clark, Andrew E., Ed Diener, Yannis Georgellis, and Richard E. Lucas. 2008. "Lags and Leads in Life Satisfaction: A Test of the Baseline Hypothesis." *The Economic Journal* 118:222-243.

Clark, Andrew E., Paul Frijters, and Michael A. Shields. 2008. "Relative income, happiness, and utility: An explanation for the Easterlin paradox and other puzzles." *Journal of Economic Literature* 46:95-144.

Clark, Andrew E. and Claudia Senik. 2010. "Who Compares to Whom? The Anatomy of Income Comparisons in Europe." *Economic Journal* 120:573-594.

Cummins, Robert A. 1995. "On the Trail of the Gold Standard for Life Satisfaction." *Social Indicators Research* 35:179-200.

Davis, James A. 1984. "New Money, an Old Man/Lady and 'Two's Company': Subjective Welfare in the NORC General Social Surveys, 1972-1982." *Social Indicators Research* 15:319-50.

De Jong, Gordon F., A. Chamratrithirong, and Q. G. Tran. 2002. "For better, for worse: Life satisfaction consequences of migration." *International Migration Review* 36:838-863.

Di Tella, Rafael and Robert MacCulloch. 2006. "Some Uses of Happiness Data in Economics." *Journal of Economic Perspectives* 20:25-46.

Easterlin, Richard A. 1974. "Does economic growth improve the human lot?" Pp. 89-125 in *Nations and Households in Economic Growth: Essays in honor of Moses Abramowitz*, edited by P. A. David and M. W. Reder. New York: Academic Press.

Easterlin, Richard A. 2001. "Income and Happiness: Toward a Unified Theory." *The Economic Journal* 111:465-84.

Easterlin, Richard A. 2005. "A puzzle for adaptive theory." *Journal of Economic Behavior & Organization* 56:513-521.

Easterlin, Richard A. and Anke C. Plagnol. 2008. "Life satisfaction and economic conditions in East and West Germany pre- and post- unification." *Journal of Economic Behaviour and Organisation* 68:433-444.

Ferrer-i-Carbonell, Ada. 2005. "Income and well-being: an empirical analysis of the comparison income effect." *Journal of Public Economics* 89:997-1019.

Festinger, Leon. 1954. "A Theory of Social Comparison Processes." *Human Relations* 7:117-140.

Firebaugh, Glenn and Mattew B. Schroeder. 2009. "Does Your Neighbor's Income Affect Your Happiness?" *American Journal of Sociology* 115:805-831.

Frey, Bruno S. and Alois Stutzer. 2002. *Happiness and Economics*. Princeton: Princeton University Press.

Frey, Bruno and Alois Stutzer. 2005. "Happiness Research: State and Prospects." *Review of Social Economy* 112:207-228.

Frijters, Paul, John P. Haisken-DeNew, and Michael A. Shields. 2002. "Individual Rationality and Learning: Welfare Expectations in East Germany Post-Reunification." *IZA Discussion Paper, no 498*.

Frijters, Paul, John P. Haisken-DeNew, and Michael A. Shields. 2004. "Investigating the Patterns and Determinants of Life Satisfaction in Germany Following Reunification." *The Journal of Human Resources* 39:649-674.

Headey, Bruce. 2010. "The Set Point Theory of Well-Being Has Serious Flaws: On the Eve of a Scientific Revolution?" *Social Indicators Research* 97:7-21.

Headey, Bruce, Ruud Muffels, and Gert G. Wagner. 2010. "Long-Running German Panel Survey Shows that Personal and Economic Choices, Not Just Genes, Matter for Happiness." *Proceedings of the National Academy of Science of the United States (PNAS)* 107:17922-17926.

Headey, Bruce, Ruud Muffels, and Gert G. Wagner. 2011. "Choices which Change Life Satisfaction: Similar Results for Australia, Britain and Germany." *Social Indicators Research* 102:1-31.

Headey, Bruce W. and Alexander J. Wearing. 1989. "Personality, Life Events and Subjective Well-Being: Toward a Dynamic Equilibrium Model." *Journal of Personality and Social Psychology* 57:731-39.

Headey, Bruce W. and Alexander J. Wearing. 1992. *Understanding Happiness: A Theory of Subjective Well-Being*. Melbourne: Longman Cheshire.

Hunt, Jennifer. 2006. "Staunching Emigration from East Germany: Age and the Determinants of Migration " *Journal of the European Economic Association* 4:1014-1037.

Iacus, Stefano, Gary King, and Giuseppe Porro. 2011. "Causal Inference Without Balance Checking: Coarsened Exact Matching." *Political Analysis* online

Kahneman, Daniel and Alan B. Krueger. 2006. "Developments in the Measurement of Subjective Well-Being " *Journal of Economic Perspectives* 20:3-24.

Knight, John and Lina Song. 2006. *Subjective Well-Being and Its Determinants in Rural China*. University of Nottingham: mimeo.

Layard, Richard. 2005. *Happiness: Lessons from a New Science*. New York: Penguin.

Liebig, Thomas and Alfonso Sousa-Poza. 2004. "Migration, Self-Selection and Income Inequality: An International Analysis." *Kyklos* 57:125-146.

Lundholm, Emma and Gunnar Malmberg. 2006. "Gains and Losses, Outcomes of Interregional Migration in the Five Nordic Countries." *Geografiska Annaler. Series B, Human Geography* 88:35-48.

Luttmer, E. F. P. 2005. "Neighbors as negatives: Relative earnings and well-being." *Quarterly Journal of Economics* 120:963-1002.

Lykken, David. 1999. *Happiness: What Studies on Twins Show Us about Nature, Nature, and the Happiness Set Point*. New York: Golden Books.

Lykken, David and Auke Tellegen. 1996. "Happiness is a Stochastic Phenomenon." *Psychological Science* 7:186-189.

Matthes, Britta. 2004. "Der Erwerbseinstieg in Zeiten gesellschaftlichen Wandels: Ost- und westdeutsche Jugendliche auf dem Weg ins Erwerbsleben." Pp. 173-199 in *Geboren 1964 und 1971: Untersuchungen zum Wandel von Ausbildungs- und Berufschancen*, edited by K. U. Mayer and S. Hillmert. Wiesbaden: VS-Verlag.

Melzer, Silvia M. 2011a. "Does Migration Makes You Happy? The Influence of Migration on Subjective Well-Being." *Journal of Social Research & Policy* 2:73-92.

Melzer, Silvia M. 2011b. "Reconsidering the Effect of Education on East-West Migration in Germany." *European Sociological Review* online first:doi: 10.1093/esr/jcr056.

Michalos, Alex C. 1985. "Multiple Discrepancies Theory." *Social Indicators Research* 16:347-413.

Muffels, Ruud and Bruce Headey. 2011. "Capabilities and Choices: Do They Make Sen'se for Understanding Objective and Subjective Well-Being? An Empirical Test of Sen's Capability Framework on German and British Panel Data." *Social Indicators Research* (forthcoming).

Neto, Félix. 1995. "Predictors of Satisfaction with Life Among Second Generation Migrants." *Social Indicators Research* 35:93-116.

Powdhavee, Nattavudh (2008), Putting a Price Tag on Friends. Relatives, and Neighbours: Using Surveys of Life Satisfaction to Value Social Relationships, *Journal of Socio-Economics,* Vol. 37:1459-1480.

Quinn, Michael A. 2006. "Relative Deprivation, Wage Differentials and Mexican Migration " *Development Economics* 10:135-153.

Rodgers, Willard. 1982. "Trends in ReportedHappiness within Demographically Defined Subgroups, 1957-78." *Social Forces* 60:826-42.

Runciman, Walter G. 1966 *Relative Deprivation and Social Justice: A Study of Attitudes to Social Inequality in Twentieth Century England*. Westminster, London: Penguin Books Ltf.

Scitovsky, Tibor. 1992. *The joyless economy: The psychology of human satisfaction*. Oxford: Oxford University Press.

Sen, Amartya 1983. "Development: Which Way Now?" *The Economic Journal* 93:742-62.

Senik, Claudia. 2009. "Direct evidence on income comparisons and their welfare effects." *Journal of Economic Behavior and Organization* 72:408-24.

Sjaastad, Larry A. . 1962. "The Costs and Returns of Human Migration." *The Journal of Political Economy* 70:80-93.

Smith, Tom W. 1979. "Happiness: Time Trends, Seasonal Variations, Intersurvey Differences, and Other Mysteries." *Social Psychology Quartely* 42:18-30.

Schnittker, Jason. 2008. "Happiness and Success: Genes, Families, and the Psychological Effects of Socioeconomic Position and Social Support." *American Journal of Sociolgy* 114:233-259.

SOEPmonitor 1984-2007. 2008. "SOEPmonitor 1984-2007: Time Series on selected indicators about "Living in Germany"." Pp. http://www.diw.de/sixcms/detail.php/284474.

Stanca, Luca 2010. "The Geography of Economics and Happiness: Spatial Patterns in the Effects of Economic Conditions on Well-Being." *Social Indicators Research* 99:115-133.

Stark, Oded. 1991. "A Relative Deprivation Approach to Migration." Pp. 85-166 in *The Migration of Labor*, edited by O. Stark. Cambridge: Basil Blackwell.

Stark, Oded. 2006. "Inequality and migration: A behavioral link." *Economics Letters* 91:146-152.

Stark, Oded and David E. Bloom. 1985. "The New Economics of Labor Migration " *The American Economic Review* 75:173-178.

Stark, Oded, Maja Micevska, and Jerzy Mycielski. 2009. "Relative poverty as a determinant of migration: Evidence from Poland." *Economics Letters* 103:119-122.

Stark, Oded and J. Edward Taylor. 1989. "Relative Deprivation and International Migration." *Demography* 26:1-14.

Statistisches Bundesamt. 2004. *Datenreport 2004: Zahlen und Fakten über die Bundesrepublik Deutschland* Bonn: Bundeszentrale für politische Bildung

Stevenson, Betsey and Jastin Wolfers. 2008. "Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox." *IZA Discussion Paper 3654 Institute for the Study of Labor*.

Veenhoven, Ruut. 1991. "Is Happiness Relative?" *Social Indicators Research* 24:1-34.

Wagner, Gert G., Joachim R. Frick, and Jürgen Schupp. 2007. "The German Socio-Economic Panel Study (SOEP) - Scope, Evolution and Enhancements." *Schmollers Jahrbuch* 127:139-169.

Wooldridge, Jeffrey M. 2009. *Introductory Econometrics A Modern Approach. 4th ed.*, vol. Chapter 3. Mason: South Western.

Yang, Yang. 2008. "Social Inequalities in Happiness in the United States, 1972 to 2004: An Age-Period-Cohort Analysis." *American Sociological Review* 73:204-226.

Graph 1: Evolution of subjective well-being, income and hourly wages of male and female migrants moving from Eastern to Western Germany and vice versa, and of non-migrants, 1992-2006
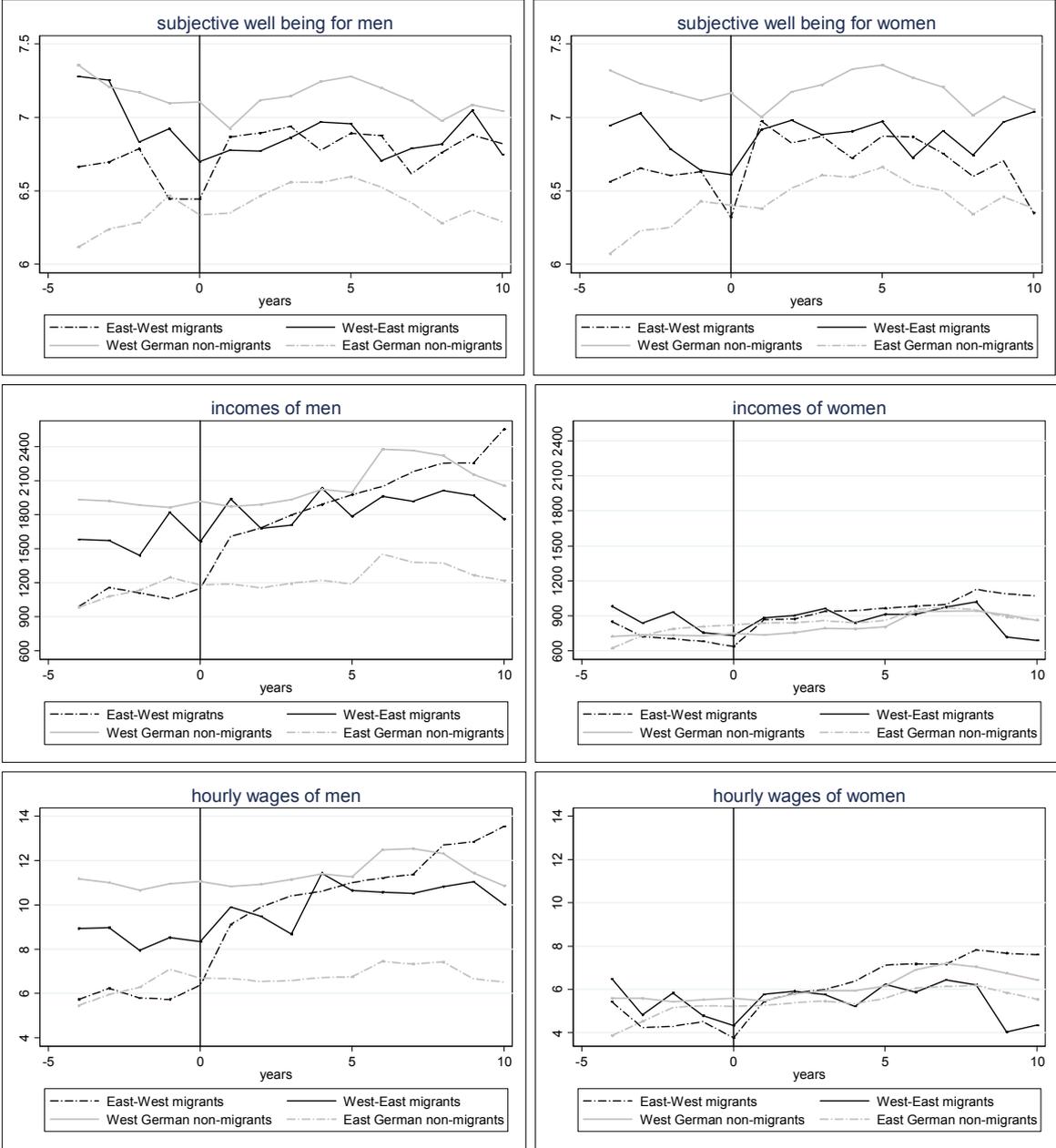
Source: SOEP, 1990-2008

Graph 2: Simulated effects of adaptation (AD), social comparison (SC) and relative deprivation (RD) on subjective well-being before and after migration according to the FE-model, males and females
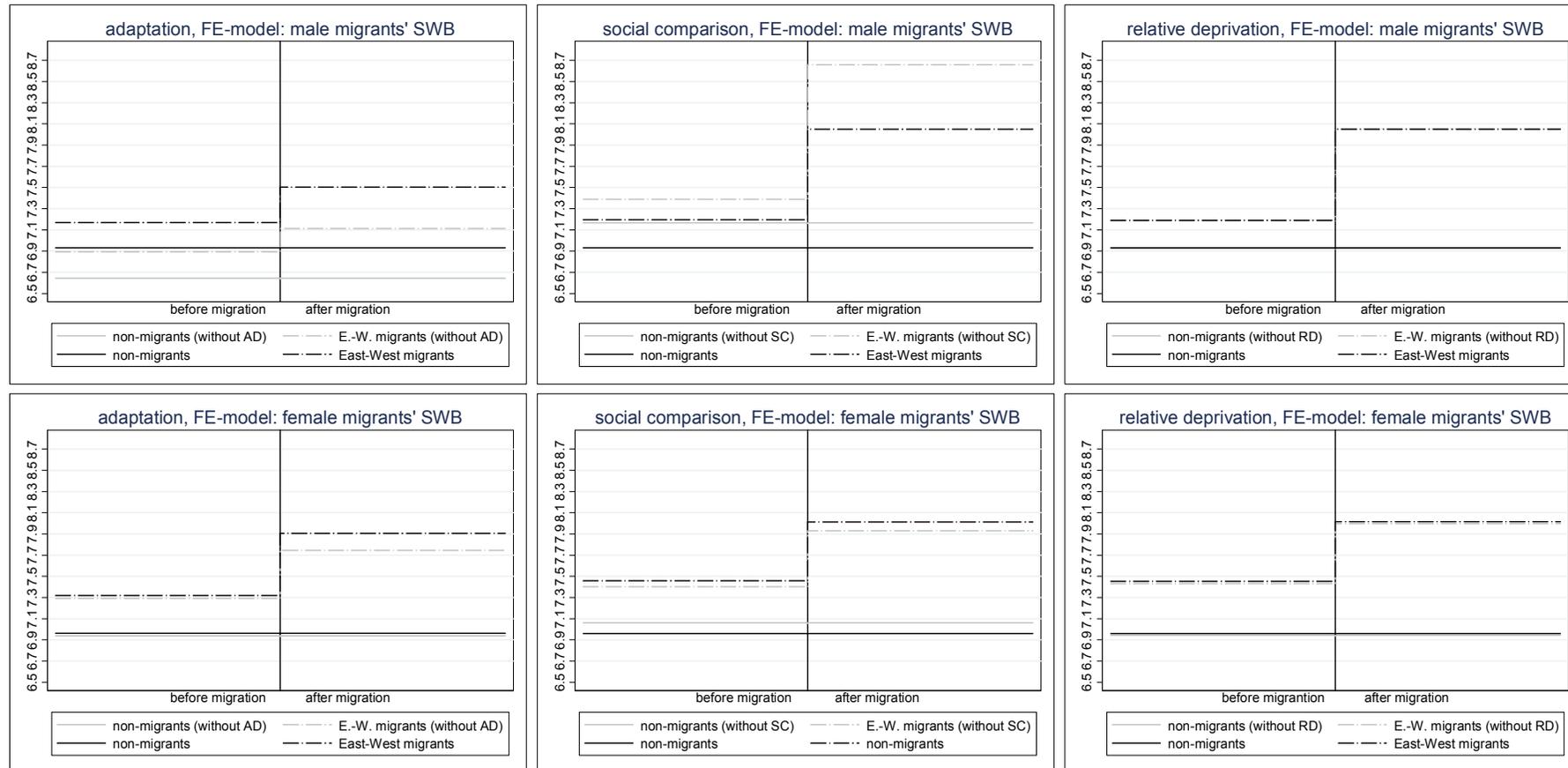
Source: SOEP, 1990-2008

Table 1: Descriptive statistics for East-West (E-W.), West-East (W-E.) migrants before and after relocation and for Eastern and Western non-migrants

	West G.	East G.	East –West migrants		West - East migrants		West G.	East G.	East –West migrants		West - East migrants	
			males						females			
			before	after	before	after			before	after	before	after
satisfaction	7.1	6.4	6.5	6.9	7.0	6.7	7.2	6.4	6.5	6.8	6.9	6.9
age	41.2	42.1	30.2	37.5	33.8	35.3	40.9	42.1	30.9	36.1	34.0	32.2
single	20.9	18.8	49.7	22.2	34.0	31.8	14.7	12.3	44.2	15.5	35.1	31.3
found a partner	8.9	11.6	10.5	18.3	23.2	21.8	9.3	12.1	10.2	18.7	24.9	21.2
got married	65.0	64.1	35.1	55.4	36.3	36.7	66.6	66.9	34.0	55.3	32.5	37.4
divorced	4.6	4.9	4.7	4.1	6.5	9.6	7.1	6.2	10.3	9.2	7.4	9.5
widowed	0.6	0.6	0.0	0.0	0.0	0.0	2.3	2.5	1.2	1.2	0.1	0.5
no sec. degree. lower sec. degree	37.6	22.7	6.9	10.5	21.2	13.9	34.2	21.5	8.7	5.2	9.6	7.8
intermediate sec. degree	20.4	52.2	53.1	4.3	33.5	44.5	29.2	56.1	49.6	53.5	38.0	46.0
upper secondary degree	26.9	21.6	33.0	41.6	40.2	38.7	21.5	19.1	33.0	35.2	41.0	40.2
tertiary education	19.0	24.2	20.1	33.0	22.7	21.1	12.5	29.1	27.1	31.1	24.3	20.0
employed at full time	76.4	69.6	59.1	83.8	72.0	69.4	30.5	44.9	45.7	45.0	46.6	34.3
employed in part time	2.0	1.5	1.4	1.9	2.4	2.2	23.3	16.0	6.8	20.3	9.9	9.7
apprenticeship	2.4	3.0	9.4	2.2	4.6	4.6	2.0	2.4	10.9	3.4	4.4	5.4
unemployed	19.2	25.9	30.1	12.1	21.0	23.8	44.1	36.7	36.6	31.3	39.1	50.6
monthly gros income in €	2491	1415	1264	2402	2011	2067	1001	989	800	1259	1179	834
monthly gros income estimated* in €	*2575*	*1231*					*1369*	*810*				
working hours	31.8	30.6	29.4	33.8	31.7	31.0	19.1	24.5	25.8	25.0	23.6	20.4
working hours estimated*	*32.9*	*29.7*					*22.1*	*23.2*				

SOEP data 1992-2007

* We used coarsened exact matching (c.f. Iacus, King, and Porro 2011) to account for the selectivity of migrants according to education, education squared, labor market experience and labor market experience squared. The results indicate the incomes and working hours of persons with similar levels of education and labor market experience as migrants.

Table 2: Effects of migration (Mg) between Eastern (E.) and Western Germany (W.G.) on SWB. random (RE) and fixed effects (FE) GLS estimation of the baseline model for males and females; dependent variable SWB

	males		females	
	(FE)	(RE)	(FE)	(RE)
Migration dummies				
East Germans		-0.536***		-0.782***
East-West Mg.	0.493***	-0.266**	0.729***	-0.443***
West-East Mg.	-0.195	0.384***	-0.279*	0.683***
Demographic characteristics				
Age	-0.123***	-0.129***	-0.065***	-0.078***
Age squared	0.001***	0.001***	0.000***	0.001***
Personality traits: Openness		0.052***		0.063***
Neuroticism		-0.227***		-0.207***
Agreeableness		0.077***		0.072***
Conscientiousness		0.065***		0.056***
Extroversion		0.057***		0.072***
Marital status (ref. cat.: Single)				
Found a partner	0.205***	0.135***	0.188***	0.151***
Married	0.219***	0.225***	0.199***	0.265***
Divorced	-0.152*	-0.210***	-0.099	-0.117**
Widowed	-0.347*	-0.212*	-0.200+	-0.033
Household Type (ref. cat.: Single)				
Couple without children	0.012	0.115**	0.035	0.119***
Single parent	-0.061	-0.055	-0.011	-0.029
Couple with children <16	0.075	0.132***	0.118*	0.185***
Couple with children ≥16	-0.017	0.056+	0.031	0.099**
Couple with child <16 and ≥16	0.075	0.138***	0.113*	0.178***
Multiple-generation household	-0.039	0.075	0.062	0.116*
Other combinations	-0.045	0.038	-0.012	0.089+
Education level (ref cat.: Lower)				
Intermediate secondary degree		0.105***		0.045*
Upper secondary degree		-0.916***		0.201***
Tertiary education				0.060*
Health		0.016		
Exercised at least once a week	0.075***	0.118***	0.092***	0.123***
Had health problems	-0.779***	0.101***	-0.747***	-0.882***
Employment changes (ref. cat.: full time employed)				
Started to work part time	-0.358***	-0.252***	-0.141***	-0.110***
Started apprenticeship	-0.184***	-0.093**	-0.075+	-0.095**
Became unemployed	-0.580***	-0.129***	-0.233***	-0.204***
Unemployment rates	0.009**	-0.006**	0.023***	-0.004
Person years	84123	84123	91125	91125
N of persons	8945	8945	9600	9600
R² overall	0.090	0.214	0.023	0.178
R² within	0.063	0.059	0.047	0.043
R² between	0.083	0.322	0.012	0.284
Rho	0.514	0.359	0.541	0.357

SOEP data 1991-2007; year dummies included; robust standard errors; + p< 0.1. * p < 0.05. ** p < 0.01. ***

Table 3: Effects of migration (Mg) between Eastern (E.G.) and Western Germany (W.G.) on SWB; dependent variable SWB; FE models: reference category: East and West-Germans

	(II)	(III)	(IV)	(V)	(VI)	(II)	(III)	(IV)	(V)	(VI)
			males					females		
Migration dummies										
East-West Mg	0.185	1.125***	1.244***	1.127***	1.245***	0.470**	0.424	0.477+	0.424	0.476+
West-East Mg	-0.123	-0.209	-0.210	-0.209	-0.210	-0.276*	-0.275*	-0.276*	-0.275*	-0.276*
Adaptation to income										
log absolute income (1%)[1]	0.048***	0.047***	0.047***	0.047***	0.047***	0.016***	0.016***	0.016***	0.016***	0.016***
log absolute inc. last year (1%)[1]	0.012***	0.012***	0.012***	0.012***	0.012***	-0.006*	-0.006*	-0.006*	-0.006*	-0.006*
Social comparison										
log W.Gs' reference group income (1%)[2]	-0.142***	-0.140***	-0.140***	-0.140***	-0.140***	-0.107***	-0.107***	-0.107***	-0.107***	-0.107***
log E.Gs' reference group income (1%)[2]	0.029	0.028	0.029	0.028	0.029	0.128***	0.128***	0.128***	0.128***	0.128***
Relative deprivation										
Relative Income Change: Increase[3]	0.003***	0.003***	0.003***	0.003***	0.003***	0.001**	0.001**	0.001**	0.001**	0.001**
Decrease[3]	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
Interaction effects with migration										
log income* E-W Mg (1%)	0.026	0.037	0.039	0.027	0.028	0.039*	0.038+	0.039+	0.036	0.037
log income last year.* E-W Mg (1%)	0.008	0.014	0.015	0.018	0.020	0.014	0.013	0.014	0.016	0.016
log RG[1] income in W.* E-W Mg (1%)		-0.468*		-0.436*			0.026		0.025	
log RG[1] income in E.* E-W Mg (1%)			-0.552**		-0.522**			-0.004		-0.006
Rel. Inc. Change: Increase * E-W Mg				-0.001	-0.001				0.001	0.001
Decrease * E-W Mg				-0.003	-0.003				-0.000	-0.000
Person years	84123	84123	84123	84123	84123	91125	91125	91125	91125	91125
N of persons	8945	8945	8945	8945	8945	9600	9600	9600	9600	9600
R^2 overall	0.104	0.090	0.089	0.090	0.089	0.023	0.023	0.023	0.023	0.023
R^2 within	0.063	0.063	0.063	0.063	0.063	0.047	0.047	0.047	0.047	0.047
R^2 between	0.107	0.082	0.082	0.082	0.082	0.013	0.013	0.013	0.013	0.013
Rho	0.506	0.514	0.514	0.514	0.514	0.541	0.541	0.541	0.541	0.541

SOEP data 1991-2007. $+ p < 0.1$. $* p < 0.05$. $** p < 0.01$. $*** p < 0.001$; time dummies and all control variables from Model 1 included; robust standard errors; [1]variables measuring adaptation; [2] variables measuring social comparison; [3] variables measuring relative deprivation and integration

Appendix

Table A1: Description of additional dependent and control variables.

	other dependent variables and control variables
East Germans	A dummy variable takes the value one (1) for persons who live in East Germany and is otherwise zero (0).
age	The age of is measured directly in years and years squared.
personality traits	Five variables on a scale from 1 till 7 indicate five personality traits: openness, neuroticism, agreeableness, conscientiousness and extraversion.
marital status	Four dummy variables indicated whether a person was single (1), has found a partner (2), or was married (3), divorced (4) or widowed (5).
household type	Using a set of dummy variables we differentiate between single households (1), single parents households (2), households where a couple without children lives (3), a couple with children younger than 16 (4), children older than 16 (5), and children older and younger than 16 live (6), multi generation household (7) and other combinations (8).
education	Using three dummy variables it is distinguished between secondary degree or lower (1), intermediate secondary degree (2), upper secondary degree (3) and persons with tertiary education (4).
health	A dummy variable takes the value one (1) if a person exercises at least once a week and is otherwise (0). Another dummy variable indicates if an individual describes his or her current health status as poor or bad (value 1 otherwise 0).
employment status	A set of dummy variables was used to distinguish between four different conditions: (1) full-time employment; (2) part-time employment; (3) apprenticeship; and (4) unemployed, on maternity leave, or employed on an irregular basis.[2]
unemployment rates	Gender specific unemployment rates displaying the unemployment for East and West Germany in percent are used.