Home Sweet Home? Macroeconomic Conditions in Home Countries and the Well-Being of Migrants*

Alpaslan Akay, Olivier Bargain, Klaus F. Zimmermann

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Abstract

This paper examines whether the subjective well-being of migrants is responsive to fluctuations in macroeconomic conditions in their country of origin. Using the German Socio-Economic Panel for the years 1984 to 2009 and macroeconomic variables for 24 countries of origin, we exploit country-year variation for identification of the effect and panel data to control for migrants' observed and unobserved characteristics. We find strong evidence that migrants' well-being responds negatively to an increase in the GDP of their home country. That is, migrants seem to regard home countries as natural comparators, which grounds the idea of relative deprivation underlying the decision to migrate. The effect decline with years-since-migration and with the degree of assimilation in Germany. We derive important implications for labor market and migration policies.

Key Words : Migrants, well-being, GDP, unemployment, relative concerns/deprivation.

JEL Classification : C90, D63

*__Acknowledgements:__ Akay is affiliated with the University of Gothenburg, IZA and LISER; Bargain is affiliated with Aix-Marseille University (Aix-Marseille School of Economics), CNRS & EHESS, IZA and LISER; Zimmermann is affiliated with IZA and the University of Bonn. We are grateful to Derek Stemple and Victoria Finn for careful proof-reading and to participants to seminars at CEPS-INSTEAD, DIAL, AMSE, IZA and at the Jerusalem AM^2 conference for comments. Corresponding author: Olivier Bargain, GREQAM, Château Lafarge, Route des Milles, 13290 Les Milles, France, olivier.bargain@univ-amu.fr

1 Introduction

Many industrialized countries seek to understand why the "bad" jobs are more often taken up by migrants than natives; why this is not necessarily the case some years after settlement or for migrants' children (the second generation); what drives "circular" migration to the home countries. All these questions are not only related to the degree of assimilation of migrants in the destination country but also to its natural counterpart, i.e. the process of "disintegration" from their home countries (Nekoey, 2013). The latter process, which describes how migrants' home country ties weaken over time, is less studied and understood in the economic literature. Migrants may keep non-economic links with their home land (culture, altruism, patriotic feelings during soccer games) but may also experience adverse or competing feelings if the home country is taken as a natural comparator regarding economic performances.

We suggest investigating this dimension using subjective well-being (SWB) data. Self-reported measures of life satisfaction have been increasingly used as proxies for utility during the last decade (see the review Clark et al., 2008). This literature has established the importance of relative or positional concerns, notably the influence of a person's relative income compared to a reference group on her welfare (see Easterlin, 1995, McBride, 2001, Ferrer-i-Carbonell, 2005, Luttmer, 2005, Senik 2004, Clark and Senik, 2010, among others). Admittedly, it is difficult to identify the relevant reference point for a given population. As argued above, however, migrants offer an interesting case study. They are indeed confronted with possibly multiple and switching reference groups: home countries and regions of destination. This question is related to the migration decision itself, and to the close concept of "relative deprivation", often cited in the migration literature (e.g., Stark and Taylor, 1991). Indeed, migration is often undertaken to improve a person's income relative to members of her reference group in the source country. To our knowledge, the literature has not yet studied relative deprivation (and the net gains from migrating) using SWB measures, or whether home countries are relevant reference points for international migrants.[1]

In this paper, we test whether migrants are sensitive to the economic performances of both their home country and destination locations using the German Socio-Economic Panel (GSOEP) over 26 years and for 24 origin countries. Time and home country variation is used to identify the effects of macroeconomic fluctuations on migrants' well-being.[2] While the approach suggested

[1] An exception is Gelatt (2013) who uses data on Latino and Asian American to test the location of immigrants' reference groups and the relationship between various measures of subjective social standing and SWB. Akay et al. (2012) also study the role of positional concerns of migrants *within* a country (China).

[2] Another recent study, Nekoei (2013), exploits 16 years $\times$ 73 origin-countries to study the effect of exchange rate volatility on migrants' labor supply in the US. Other studies check how movements in GDP, unemployment or inflation directly affect individual happiness, incl. Clark and Oswald (1994), Di Tella et al. (2001, 2003), Wolfers (2003). We relate especially to the Di Tella et al. papers and to Becchetti et al. (2013), who study the correlation

in this paper could be replicated for other countries, we believe that Germany is interesting for at least two reasons. First, it has one of the highest population of immigrants in Western countries, with almost 13% of the total population coming from various countries of the Eurasian continent (a total of 10.7 million migrants from 194 countries live in Germany). Second, the GSOEP is a large representative dataset including SWB measures, very detailed individual and household information, a panel dimension and excellent representativeness of migrants. Our main application consists in estimating migrants' SWB on a large set of individual determinants of well-being (household income, health status, etc.) and the macroeconomic variables of home countries. We also control for migrants' family circumstances in both the host and home countries, for (overall and country-specific) time trends and, using panel information, for migrants' time-invariant unobservables.

We originally show that home countries indeed act as a natural comparator for migrants. We find a marked and statistically robust effect of the home countries' macroeconomic conditions on migrants' well-being. It is fully in line with the relative concerns/deprivation hypothesis: migrants' well-being *decreases* with home country GDP per capita. We extensively check the robustness of our results as well as the validity of alternative interpretations (in particular the role of remittances and a correction for possible non-random selection into return migration). We also examine heterogeneous effect of GDP on migrants' well-being, along dimensions like years-since-migration (YSM hereafter) and objective and subjective measures of the degree of assimilation in Germany. We unveil that competing feelings towards home countries decrease after some years in the host country. Consistently, less assimilated migrants keep strong transnational ties, and origin countries are likely to remain their key reference group. Our conclusions are reinforced by the finding of an effect of opposite direction regarding local economic performances, i.e., migrants' well-being *increases* along with the GDP of the German counties in which they live. Interestingly, this 'signal effect' also declines with YSM, as if gradually replaced by relative concerns towards the local environment. These results are consistent with the existence of multiple reference points and a possible switch over time and with the assimilation process. We derive important labor market and migration policy implications from these results.

The paper is organized as follows. Section 2 presents the data and the empirical methodology. Section 3 reports the main results, robustness checks and additional results using migrants' heterogeneity. Section 4 concludes.

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between citizens' SWB (not particularly migrants') and their country's macroeconomic fluctuations. DiTella et al. (2003) use 17 years $\times$ 13 countries to capture enough regional and time variation in macroeconomic conditions. They report that GDP (unemployment and inflation) is positively (negatively) associated with citizens' well-being, explain this correlation with feelings of national prestige (for GDP), corroding purchasing power (for inflation) and loss of self-esteem, depression, anxiety and social stigma (for unemployment). Becchetti et al. (2013) show that neighboring countries can be reference groups and generate negative feelings if they succeed better.

2 Empirical Approach

2.1 Data and Selection

Our analysis is based on the German Socio-Economic Panel (GSOEP), a well-known survey of individuals in households living in Germany. It has been used in important analyses in the SWB literature (see, e.g., van Praag et al., 2003; Frijters et al., 2004a, 2004b; Ferrer-i-Carbonell, 2005). It is a representative survey of the entire German population and an exceptionally long panel, of which we are using 26 years from 1984 to 2009. It contains a wealth of information at the individual or household level, including data on education, health, labor market conditions and incomes, as well as various subjective measures of well-being. The dataset was started in 1984 in West Germany (with around 10,000 respondents per wave) and has covered the entire reunited Germany since 1990 (with around 14,000 respondents per wave after 1990 and more than 20,000 after 2000).[3]

We select all the waves of the GSOEP, keeping all adult first-generation immigrants aged 17 or older and living in West or East Germany. Although more than a hundred nationalities are reported, we restrict our study to the main migration groups, resulting in 24 different countries of origin. These correspond to the largest groups in terms of their population size in Germany and countries for which we have at least 100 observations in the data. Our dependent variable (subjective well-being, SWB) derives from the question "*How satisfied are you with your life as a whole, all things considered*?". The answer is recoded on an 11-point scale (0 signifies "*completely dissatisfied*" and 10 means "*completely satisfied*"). Life satisfaction is highly correlated with other subjective measures of well-being like self-reported happiness or aggregated answers about mental health such as the GHQ-12 (see Clark and Oswald, 1994). It has been shown that SWB information is a solid proxy for individual well-being, notably because of the strong correlation with other measures of well-being (see Oswald and Wu, 2010).[4] We combine SWB and other individual characteristics

[3]Sample weights are provided and used to guarantee the representativeness of the sample. Representativeness of the migrant population is found to be excellent in the detailed assessment of Lelkes and Zolyom (2010). Attrition in GSOEP is discussed in Spiess and Kroh (2004) and, in relation with SWB estimations, in Frijters et al. (2004b). Non-random attrition due to return migration is addressed in our analysis below.

[4]In addition, Krueger and Schkade (2008) provide extensive evidence about the robustness of SWB measures compared to more usual data used by economists. Di Tella et al. (2003) report a high regularity in SWB equation regressions across different nations (as we do for the different migrant groups in our data) while Clark et al. (2008) show that changes in SWB are good predictors of behavior responses. All these checks convey that SWB is not mere statistical noise and carries an important informational content. Nonetheless, we keep in mind the possible lack of interpersonal comparability in the perception of (and answers about) well-being. We treat this as a measurement error, namely by using large samples and by controlling for individual fixed effects in our regressions. Notice that we are interested in SWB scales per se but in the effect of home country macroeconomic performances, or in their relative effect. The latter, the trade-off between these performances and individual income, can be calculated as

with macroeconomic variables for the migrants' 24 countries, drawn from annual time series data of the World Bank indicators. We focus on the main variables of interest, including log real GDP per capita of country h in year t (denoted $GDP_{h,t}$ hereafter),[5] growth in real GDP per capita (denoted ΔGDP), price levels measured by the GDP deflator ($P_{h,t}$) and unemployment rates.[6] The resulting sample includes a total of $51,171$ individual×year observations obtained over 26 years of data and migrants from 24 origin countries. We lose a small fraction of this dataset due to missing information so that our final sample contains $47,557$ individual×year observations.

2.2 A First Look at the Data

Table A.1 in the Appendix provides some statistics for the main macroeconomic indices (real GDP per capita expressed in PPP-adjusted 2005 international dollars, nominal GDP per capita and unemployment rates) and average SWB by country of origin (over all migrants in GSOEP for the period 1984 to 2009). We also provide the ratio of real GDP per capita for each country compared to Germany. This reflects the huge variation in development levels across immigration countries,[7] and the convergence process (18 countries out of 24 have caught up with Germany over the period). A lot of variation can also be observed concerning reported well-being. On the $0-10$ scale, SWB scores 7.1 on average over all years and countries. Using the country average over 1984-2009, we see that SWB varies from 5.8 for Iranian migrants to 7.6 for Dutch migrants, which partly reflects the large variation in living conditions (as proxied by $GDP_{h,t}$) across nations. This is illustrated by the cross-country correlation between mean SWB and absolute real GDP (resp. unemployment rate), i.e., .46 (resp $-.40$).[8]

In Table A.1, we also report country-specific correlations between yearly SWB and GDP (or unemployment). We use variation in annual SWB (calculated as the mean SWB over all migrants of a country for a given year) and GDP over time. Interestingly, for GDP (resp. unemployment), the correlations are negative (resp. positive) in the majority of countries, as if increases in GDP per capita (resp. unemployment) were associated with a decline (resp. rise) in the well-being of

an "equivalent income" measure of relative concerns, as explained below.

[5] In all the estimations hereafter, we use the log of real GDP per capita divided by $10,000$, for comparability with Di Tella et al. (2003).

[6] See http://data.worldbank.org/indicator.

[7] For instance, the ratio is as little as 30% (resp. 28%) of the German real (resp. nominal) GDP per capita for Iran and up to 113% (resp. 99%) for the Netherlands.

[8] However, differences in income levels do not perfectly explain the well-being gap. The relationship between income and well-being may not be linear: beyond a certain income level, income differences have smaller effects on perceived well-being (this pattern is found in Easterlin, 1995, but questioned more recently by Stevenson and Wolfers, 2008, who do not reject linearity). For instance, the correlation between mean SWB and real GDP per capita is smaller when GDP is expressed in logs (.36). Moreover, if we focus on Western European countries and the US, this correlation drops to .07.

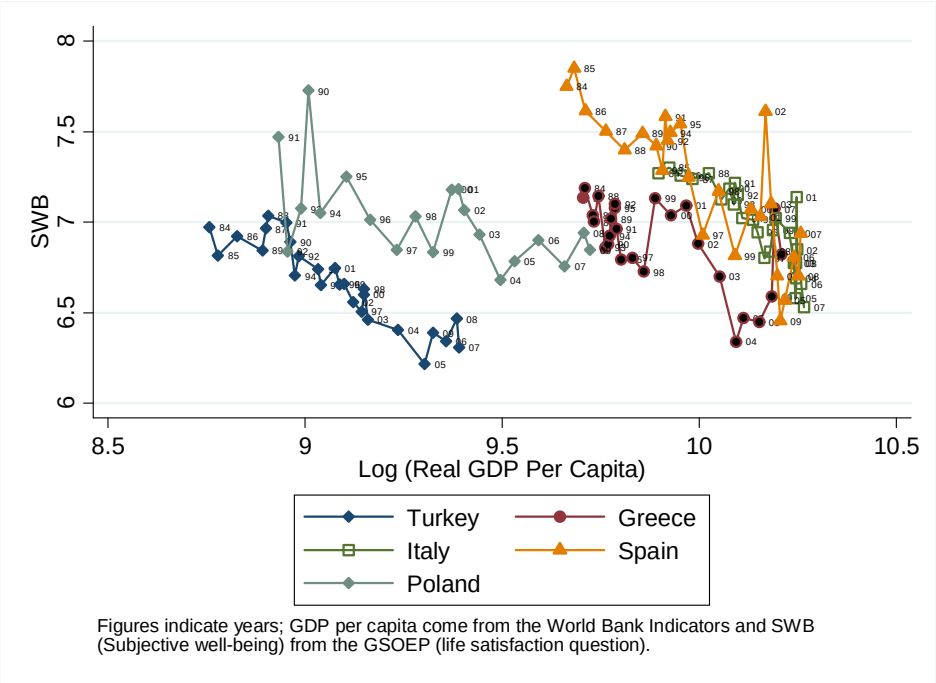

Figure 1: SWB versus GDP: Time Trends

the corresponding migrants. This unexpected result is illustrated in Figure 1 for the five largest migrant groups (those from Turkey, Greece, Italy, Spain and Poland). We plot log real GDP per capita against mean SWB for all our panel years. While GDP increases almost steadily over the period, SWB shows a clear declining trend. That is, the negative relationship between home country GDP and migrants' SWB seems to characterize the whole period (with a few exceptions) and most immigration countries.[9] We do the same for unemployment rates (Figure A.1 in the appendix): the pattern is not as pronounced as for GDP, yet it seems as though increases in unemployment rates are associated with an increase in SWB.

These preliminary results directly align with the interpretation in terms of relative concerns/deprivation suggested in this paper. With the Easterlin paradox (Easterlin, 1995), the fact that a country like Germany has experienced GDP growth but a flat trend in SWB over the past 30 years often pertains to the classic explanation in terms of "positionality". That is, after some point, well-being would depend more on relative income than on absolute income, so that absolute increases in national wealth would not improve well-being over time. For migrants, one could in fact expect an even more radically opposed trend between GDP and SWB. Indeed, if home countries

[9]This result is not only driven by the periods of economic growth. While not visible in Figure 1, we observe in source data that, for instance, the downturns of 1993-1994 and 2000-2001 in Turkey or the 2008-2009 recession in Italy are associated with an increase in SWB among migrants from these countries.

act as reference points and if most countries "catch up" with Germany, the relative position of migrants declines over time and their SWB can be negatively affected. This is exactly what Figure 1 illustrates. In the sequel, we attempt to better characterize this effect by means of regressions while controlling for migrants' characteristics. We shall demonstrate that these trends in SWB and home GDP are not just two unrelated time trends: they are causally linked by the fact that origin countries serve as a reference point against which migrants assess their own well-being.

2.3 Modeling the Well-being of Migrants

Using our selected panel of migrants living in Germany, we estimate the well-being SWB^* of migrant i from home country h at time t as follows:

$$SWB^*_{iht} = X_{it}\alpha + \gamma Macro_{ht} + \theta_t + (t \times \delta_h) + \varphi_i + \varepsilon_{iht}. \quad (1)$$

Latent well-being SWB^* is considered as a proxy for the unobserved utility of a migrant, for which we observe an ordinal metric $SWB_{iht} = j$ on an ordered scale of well-being categories $j = 1, ...J$. The model combines both characteristics of migrant i at year t, X_{it}, and macroeconomic variables of her home country h at year t, $Macro_{ht}$. Individual time-varying variables in X_{it} include the usual determinants of SWB, i.e., log household income, work status, marital status and family circumstances, health status, education, other characteristics related to home country (children and spouse in home country, refugee status, remittance receipt), and German states (*Länder*).[10] We also control for year dummies θ_t (for any global shocks that are common to all countries in each year), country-specific linear time trends $t \times \delta_h$ (δ_h denotes country fixed effects), individual effects φ_i and a usual i.i.d error term ε_{iht}. Country time trends may capture, for instance, cultural attitude toward changes in well-being or country-specific unobservable assimilation patterns of migrants of country h.[11]

Our baseline estimation strategy consists in linear panel estimations with fixed effects (FE), denoted by φ_i. Alternatively, we shall experiment with the Mundlak "quasi-fixed effects" (QFE) model, which combines both between and within variation. This model allows for the inclusion of variables which drop from FE estimations, notably country effects and immigrant arrival cohorts.[12] Hence, the overall individual effect is based on a slightly more structural specification where $\varphi_i = \delta_h + Z_i + Age_{it} + YSM_{it} + u_i$, with home country effects δ_h (for unchanging cultural

[10] State effects account for possible migration patterns within Germany. Evidence in GSOEP shows, however, that geographical mobility of migrants is extremely limited (see Akay et al., 2013).

[11] Together with flexible time trends θ_t, they also represent deterministic functions of time that are used to render the data stationary (Di Tella et al., 2003, stress that for usual unit-root reasons, untrended SWB should not be regressed on trended macroeconomic indices like GDP).

[12] Migrants may vary in unobservable characteristics depending on the year they arrived in Germany (Borjas, 1999). Therefore, migrants are grouped into 9 cohorts taken 5 years apart (9 dummy variables starting from

influences of origin country on reported well-being), time-invariant characteristics Z_i (gender and cohort effects), two time variables (age and YSM, which are not identified when using FE time-demeaning panel estimation with year effects), and the Mundlak QFE u_i.[13] Finally, we consider that $J = 10$ is large enough to treat reported well-being as a continuous variable so that (1) can be estimated linearly.[14] Yet, we also provide checks where we acknowledge the ordinal nature of the dependent variable, allowing for unobserved individual effects in this nonlinear context by using the QFE ordered probit and the "Blow-up and Cluster" FE ordered logit estimators (see Baetschmann et al., 2015).

3 Results

3.1 Main Results

We first present our main results, namely the estimation of model (1) on panel data. It relates the macroeconomic conditions of home countries to individual SWB conditional on various individual and family circumstances in both the host and home countries.

Effect of GDP: Baseline Estimations. In this section, we shall present summary tables in which we report estimates of the coefficient γ only. The complete set of SWB estimates is shown and discussed in the appendix (Table A.2). Our main result is in the two first columns of Table 1. We report panel estimations of the effect of log real GDP per capita on SWB while controlling for year effects, state effects and time-invariant unobservables (FE). We obtain an estimate of $-.303$, which is significant at the 1% level.[15] The next column additionally controls for country-specific time trends to clean out the spurious correlation between macroeconomic indices and SWB. The magnitude of the effect is basically unchanged ($-.212$) but the effect is less precisely estimated,

pre-1960 arrivals until the last cohort corresponding to the last 10 years). These cohort dummies aim to capture cohort-specific unobserved characteristics affecting migrants' well-being. Grouping is necessary for identification.

[13] Following Mundlak's approach, the latter combines a normally distributed term and within-means of relevant time-variant variables (we use household income, household size, age, amount of remittances sent to the home country, education and working hours).

[14] The advantage of the linear approach is that it makes the required extensions to panel estimations much more transparent and allows including unobserved individual heterogeneity in a flexible way. Notwithstanding, Ferrer-i-Carbonell and Frijters (2004) show that results are typically similar using both linear and ordinal models, a conclusion that is shared in the present study.

[15] In all specifications, clustering is made at the year and home country level to account for possible bias due to repeated observations for the same country of origin (and to control for the correlation between errors in the same country). Alternatively, we have clustered standard errors at the individual level due to the panel nature of the data. The standard errors are increased only slightly in both cases.

even if still significant at the 10% level.[16] This finding suggests that macroeconomic movements in home countries feed through into migrants' feelings of well-being. This may be seen as an unexpected result if one believes that migrants are likely to be bounded to home lands by a sense of pride, identity and patriotic ties; they may also be linked altruistically or emotionally. We show below that such positive attachment and solidarity with the home country may exist when it comes to non-economic aspects. As far as economic conditions are concerned, our results do consolidate previous findings in the literature showing that people's well-being is evaluated against natural comparison points (ex: Luttmer, 2005) – and we show that home countries are an important one. This also relates to the fact that mean income in home countries is a marker with respect to which migrants can gauge the success of their migration experience.[17] Migrants from countries characterized by better macroeconomic performances experience lower gains from migration and, other things being equal, lower levels of well-being. Arguably, this effect may be attenuated when migrants decide to stay forever in Germany or become assimilated enough for their reference point to shift from home countries to other comparators within Germany. We investigate this point a bit later.

Magnitude. To gauge the magnitude of the effect, we suggest alternative metrics and a brief comparison with other studies. We base our calculation on the FE model with country-specific time trends. First, a one standard deviation increase in home country (log) GDP per capita is associated with a decline of 2% of a standard deviation of SWB (or a 0.5% decrease in mean SWB). While this may seem modest, it is very much in line with measures of relative concerns or socio-economic status in the literature. For instance, Di Tella et al. (2010) find that a one standard deviation change in status (i.e., an individual's relative standing to others measured by job prestige) explains 3.1% of the standard deviation in SWB. An alternatively way to gauge the effect is to take the ratio of the coefficient on log GDP per capita over the coefficient on log household income.[18] We obtain a ratio of $-.553$ which can be interpreted as an *equivalent income* variation, i.e. a 1% increase in the home country's real GDP per capita is equivalent to a .55% decrease in household income. Drawing from estimates of absolute and relative income effects in

[16] Alternatively, we have also used the Hodrick-Prescott filter to detrend macroeconomic variables before estimations (detailed results available from the authors). Doing so, we obtain an effect of $-.303$ (standard deviation of .145) for detrended GDP per capita in levels and $-.256$ (.137) for GDP per capita in logs. Hence, results are still significant in this case and the log GDP effect is of similar magnitude as in the baseline.

[17] It may come to mind that such a positional concern vis-à-vis home countries can be mitigated by the fact that some of the migrants' close relatives still live there and may be negatively affected by macroeconomic shocks. In fact, our microdata control for close relatives remaining in the home country and for the level of remittances sent by migrants to help face income shocks (see Appendix Table A.2).

[18] The latter is 0.38 in the baseline, which is of the same order as in related studies. For instance, Akay and Martinsson (2011), Ferrer-i-Carbonell (2005) and Di Tella et al. (2010) report .36, .25, and .20 respectively.

the literature, we find equivalent income measures of a similar order of magnitude, for instance $-.58$, $-.76$ and $-.82$ in Akay and Martinsson (2011), Ferrer-i-Carbonell (2005) and Luttmer (2005) respectively.

Alternative Estimators and Specifications. Our baseline results are obtained with FE linear estimations and treating SWB as a continuous variable. We check the sensitivity of our results with respect to alternative estimators. Table A.4 in the appendix reports a series of estimates, starting with the FE model without and with country-specific time trends. Acknowledging the ordinal nature of SWB data, we also show estimates of the "Blow-up and Cluster" FE ordered logit. The coefficient is still negative and significant (we cannot calculate marginal effects but we can check the equivalent income measure, $-.972$, which turns out to only slightly larger than the linear FE estimation without country time effects). Then we move to QFE estimates showing very similar results compared to the baseline ($-.281$ and $-.224$ for QFE models without and with country time effects, respectively). Equivalent incomes are also almost identical. The penultimate model augments QFE with information on personality traits based on the so-called "big fives" model. Psychological traits are increasingly used as a time-invariant and potentially important determinant of well-being (Boyce, 2010). "Big fives" traits are reported in waves 2004 and 2009 only, so cannot be extrapolate to all individuals in the panel. Despite the resulting drop in sample size, the coefficient of $-.321$ is close to the baseline. Finally, we estimate an ordered probit with QFE: the coefficient of $-.215$ is not directly comparable but the equivalent income is again very similar to baseline.

Timing and Adaptation. Turning back to Table 1, we provide additional results, starting with the timing of the effect. It may be the case that migrants are affected by the *dynamics* of their country's economic performances more than its actual level. We introduce the potential role of ΔGDP alone or together with $GDP_{h,t}$ (columns 3 and 4 of Table 1). In a FE model, the negative sign on the former term indicates that an increase in home country growth negatively affects the well-being of migrants, yet it is not significant. If introduced simultaneously, the GDP effect remains significant and close to the baseline. A more flexible way to account for dynamics is to introduce lagged GDP. Macroeconomic fluctuations may be perceived with a delay or their impact on SWB could depend on longer-term trends rather than on current economic conditions. Lagged macroeconomic variables can also relate to adaptation effects (Di Tella et al. 2010, Di Tella et al., 2003), stemming from the idea that migrants may adjust to the home country GDP after a period of time and thereafter only derive negative positional feelings from increases in GDP. Columns 5 and 6 show results with 1-year and 2-year lags of GDP respectively. Di Tella et al. (2010) interpret the sum of lagged effects as the amount of adaptation. We observe that lagged GDP effects change sign. Only the 2-year lag is significant but an F-test of whether the joint effect of

all GDP variables (i.e., current and lagged) is zero can be rejected. With one lag (two lags), 17% (9%) of an initial increase of GDP is lost over the ensuing year(s), leaving a long lasting effect of $-.337$ ($-.426$) on SWB, which is very similar to our baseline result. We draw two lessons from these results. First, it is obviously not possible to identify the precise timing due to the high correlation between $GDP_{h,t}$, $GDP_{h,t-1}$ and $GDP_{h,t-2}$. This is no impediment to our analysis, as cumulated effects do not change our conclusions. Second, we find no evidence of an adaptation effect to individual positional concerns towards the home country.[19]

Table 1: Effect of Home-country GDP on Migrant SWB: Micro Data (cont.)

Dependent variable: SWB	1	2	3	4	5	6	7	8
GDP	-0.303 ***	-0.212 *		-0.338 ***	-0.406 *	-0.468 **	-0.349 ***	-0.437 ***
	(0.107)	(0.125)		(0.120)	(0.221)	(0.233)	(0.120)	(0.142)
ΔGDP			-0.110	-0.095				
			(0.169)	(0.170)				
GDP (t-1)					0.069	0.378		
					(0.193)	(0.286)		
GDP (t-2)						-0.336 *		
						(0.185)		
Prices (GDP deflator)							-0.012	
							(0.009)	
Exchance Rates								0.004
								(0.005)
Individual effects (a)	FE	FE	FE	FE	FE	FE	FE	FE
State effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Home country linear time trends	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GDP (equivalent income)	-0.797	-0.553		-0.889	-1.069	-1.237	-0.918	-1.110
GDP (equiv. inc. cumul.)					-0.887	-1.126		
R2 or pseudo-R2	0.140	0.141	0.139	0.139	0.139	0.138	0.139	0.135
# observations	47,557	47,557	47,557	47,557	47,557	47,557	47,557	45,974

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. Linear estimations performed on migrants from 24 countries over 26 years. GDP refers to log of real GDP per capita, taken from World Bank indicators. Subjective well-being (SWB) taken from the German Socio-Economic Panel. All models include the time-varying characteristics reported in appendix Table A.2 as well as fixed effects (FE), state effects (16 federal states of Germany) & year effects.

Price Effects and Exchange Rates. In place of real GDP, it would make sense to include log nominal GDP per capita, denoted $GDP^{nom}_{h,t}$, to check if migrants are to some extent victims of monetary illusion (Boes et al., 2007). That is, migrants should be affected by the success of their home country in terms of nominal GDP, but they should also know that a price increase in

[19] If any, this is a very partial adaptation process, which is consistent with the findings in Di Tella et al. (2010) or Ferrer-i-Carbonell and van Praag (2008). These authors show that while people adapt almost fully to changes in absolute living standards, they do not (or only partly) adapt to changes in status.

their home country reduces their relative deprivation as it decreases the relative cost of living in Germany. Since $GDP^{nom}_{h,t} = P_{ht} + GDP_{h,t}$, with P_{ht} as the log price index (log GDP deflator), we can simply introduce the latter in the SWB regression together with $GDP_{h,t}$. Column 7 in Table 1 shows that the effect of log real GDP per capita is unchanged while the log price level has no significant effect. Even if not a definitive proof, this is suggestive evidence that real GDP is what truly matters for well-being, i.e. migrants do not suffer from monetary illusion. Other interpretations should be mentioned. In particular, migrants from countries with lower relative prices could take advantage of the relative higher purchasing power of their income when they go home on holidays. In this case, higher prices in the home country should decrease rather than increase SWB, an effect that may partly counteract the relative concern effect described above. For one thing, migrants could equally go to any other low-price country to take advantage of their German salaries. We nonetheless replicate estimations while including exchange rates between home country and Germany. In Column 8, the GDP effect is slightly larger than the baseline higher (but not significantly so) while the coefficient on exchante rates is insignificant.

Unemployment. The effect of home country unemployment rates on migrants' SWB is reported in Table A.5 in the appendix, using alternative specifications including simultaneous estimation of unemployment and GDP effects. The overall picture is that results are much less pronounced in the case of unemployment. Consistently with our positionality interpretation, the coefficient on unemployment is positive. Yet it is small enough, or the effect imprecisely estimated, so that it becomes insignificant as soon as individual effects (FE or QFE) are introduced. This could be explained by the fact that the unemployment effect also relates to migrants' own labor market prospects in case of return migration. Another explanation is the fact that informal work might be a more relevant measure than unemployment for the poor countries sending migrants to Germany.

3.2 Sensitivity Analysis

Regions of Origin. We investigate the sensitivity of our results to country and year selection. First, the Turkish migrants are by far the largest group among all migrants in Germany (25.1% of the total foreign population, see Table A.1). We check if it drives the results. In columns (a) and (b) of Table 2, we report estimates of the FE model on our sample excluding Turkish migrants and on Turkish migrants alone. The effect of $GDP_{h,t}$ is negative and significant in both cases. It is very similar to the baseline in the model without Turkey, conveying that results are not driven by Turkish migrants alone. The coefficient is very large (but less precisely estimated) when using only time variation among Turkish migrants. Next, we check whether the effect varies with the geographical distance to Germany. Closer countries are in general richer (so that the rate through which they may converge towards German GDP is lower), yet performance comparisons

can be easier to do. Countries located farther away are poorer but make circular migration more difficult (especially in the early years of our panels during which possibilities of air travel were not as developed as today). Columns (c) and (d) in Table 2 show estimates using a threshold of 2,100 kilometers from Germany (the median), which excludes countries like Turkey, Iran, Ukraine and Russia. The effect is larger in the more distant group, but not significantly so, compared to countries in the vicinity of Germany. Finally, we distinguish countries of origin by level of economic development: OECD/rich countries (real GDP above 65% of German real GDP), middle income ($35-65\%$), poor countries (below 35%). Estimates in columns (e)-(g) display a U-shaped pattern, i.e. stronger effects from less developed countries, insignificant effect in the middle group, and the largest effect from rich countries. The latter may correspond to the fact that the economic performances of neighboring countries are most visible (see also Becchetti et al., 2013) and generate most regret among migrants who do not benefit from the positive dynamics at home.

Asymmetrical Effects. We also verify if selected years make a difference. As previously seen in Figure 1, most countries in our sample experience economic growth for a majority of the years 1984-2009. We investigate whether our results are driven by these episodes of growth or whether recession years tell us a similar story. While upturns in home countries are expected to trigger relative concerns among migrants, downturns may have an asymmetrical effect if migrants experience more sympathy toward their nation during bad years. We interact macroeconomic conditions with dummy variables for upward or downward changes in these variables. The results are reported in columns (h) and (i) of Table 2. Both upward and downward changes in the home country GDP affect migrants' well-being. While the effect generated by economic downturns in home countries is smaller, as conjectured above, the difference with upturns is neither large nor significant.

Non-Economic Outcomes. We have narrowed our empirical quest to the effect of economic conditions in home countries on SWB. While the impact may well be due to motives of relative deprivation/concerns, as we argued, these may not extend to non-economic dimensions. We have speculated above that shocks to the home country of a non-economic nature may evoke the expected sympathy with the origin country and thus have an opposite effect. We now test this hypothesis by using two indicators related to actual and potential conflicts as well as long-term life conditions in the home country. Precisely, we perform separate estimations of the effect of battle-related deaths (log number of people) and life expectancy (number of years) on migrants' SWB, using the same controls as in the baseline model. We find estimates of -0.014 (standard error of .006) and .014 (.009) respectively, i.e. significant effects which denote migrants' feelings of sympathy towards their home countries when it comes to non-economic domains. When we include these variables together with $GDP_{h,t}$, their coefficients are basically unchanged while the

Table 2: Effect of Home-country Macroeconomics on Migrant SWB: Sensitivity Check

Dep. variable: SWB	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	All countries but Turkey	Only Turkey	Distance to Germany $		Level of Home Country GDP $$			Checking for asymmetrical effects:	
			<median	>median	rich countries	middle income	poor countries	upward trends	downward trends
GDP	-0.313 ***	-0.745 ***	-0.258 **	-0.428 **	-0.718 ***	-0.126	-0.318 ***	-0.297 ***	-0.255 **
	(0.114)	(0.160)	(0.115)	(0.170)	(0.274)	(0.214)	(0.110)	(0.109)	(0.116)
GDP (equiv. Income)	-0.889	-2.209	-0.680	-1.127	-1.927	-0.338	-0.854	-0.783	-0.672
R2	0.133	0.152	0.140			0.140		0.140	
# obs.	31,303	16,254	47,557			47557		47,557	

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. Linear estimations performed on migrants from 24 countries over 26 years. GDP refers to log of real GDP per capita, taken from World Bank indicators. Subjective well-being (SWB) taken from the German Socio-Economic Panel. All models include the time-varying characteristics reported in appendix Table A.2 as well as fixed effects, state effects (16 federal states of Germany), year effects and home country linear time trends. Models (c) to (i) obtained by interaction effects. $ Median 2100 km from German boarders. $$ Rich (middle income, poor) countries are defined as those with real GDP above 65% (between 35 and 65%, below 35%) of German's real GDP.

GDP effect is very similar to our usual results, i.e. a significant negative effect (detailed results available upon request).

3.3 Alternative Interpretations

Di Tella et al. (2003) discuss the possible endogeneity of national GDP effects on citizens' life satisfaction. They reckon that it is difficult to find believable macroeconomic instruments and suggest to instead experiment with different forms of lag structures. In the present context, there is much less concern for endogeneity given the minimal influence of migrants on their home country's GDP. Nonetheless, relative changes in home country GDP may affect migrants through three other channels besides positional concerns, namely migration flows, remittances and the option to return home. We now investigate whether these variables challenge our interpretations by responding themselves to country-of-origin conditions.

Inflow of Country-Fellows. A potential effect of bad economic conditions in the home country is that more potential immigrants from that country may be interested to migrate to Germany. Possibly they migrate to the same regions where their co-nationals already live. In this case, an increased flow of new migrants may enhance the well-being of existing migrants (which would reduce our effect) or decrease it (which would explain our effect). Additional, unreported estimations depart from our baseline model by including the proportion of immigrants in local labor markets. They show no effect of the latter while the effect of $GDP_{h,t}$ is basically unchanged.

This is also true when we include local labor market conditions and capture changes in migrants' proportions (see Akay et al., 2013, for a more detailed analysis). More generally, the formation of enclaves requires long lasting dynamics, probably mixing people of different nationalities. Also, migration inflows cannot respond freely to changes in home country economic conditions.

Return Migration. A second channel is return migration, which we treat as a more serious challenger in terms of result interpretation. Indeed, the potential return decision concerns each migrant directly. We first empirically check whether return migration depends on changes in the home countries' macroeconomic performances. We suggest the following model:

$$r_{iht} = \mathbf{1}(X_{it}.\eta + \mu.Macro_{ht} + \nu_i + \xi_h + \pi_t + \upsilon_{iht} > 0), \tag{2}$$

where r_{iht} is an indicator variable taking value 1 if migrant i from country h leaves Germany in year t (and drops from the panel for this reason), and 0 otherwise. The model combines individual characteristics, X_{it}, including cohort and state fixed effects, a macroeconomic index of the home country, $Macro_{ht}$, individual effects (modeled as QFE), ν_i, country and time fixed effects, ξ_h and π_t respectively, and an i.i.d. normally distributed random term, υ_{iht}. Unreported results show that μ is positive but insignificant.[20] Next, we re-estimate SWB regressions accounting for possible return – and non-random sample attrition due to return migration – as a function of home country macroeconomic conditions. We use the Heckman procedure adapted to panel data by simultaneously estimating selection into return migration and the SWB equation by Maximum Likelihood (for a more structural approach, see Bellemare, 2007). A complete discussion on the instrumentation is provided in the appendix. The first column of appendix Table A.6 reports the effect of $GDP_{h,t}$ on migrants' SWB when controlling for selection into return migration. It is very much in line with baseline results and significant in all cases.

Remittances. Remittances constitute a third channel linking migrants to their home countries. First, remittances sent by migrants can directly affect home country macroeconomic conditions and influence, at the same time, their own well-being. Yet, the latter effect is of significant magnitude only for a limited set of countries and years.[21] Moreover, our GDP measure already includes total annual remittances received by migrants from Germany and from all other destination countries. Second, if per capita income in the home country increases, migrants may need to compensate their relatives left behind less and, hence, their SWB would increase. Note howeer that our

[20] We obtain the same conclusion with lagged GDP. Only the lagged change in GDP, i.e., $GDP_{h,t-1} - GDP_{h,t-2}$, is found to significantly affect the probability of return in year t.

[21] This concerns especially Turkey, given the size of its migrant community in Germany. For instance in 2002, remittances sent by Turkish migrants living in Germany accounted for 0.4% of the total GDP of Turkey. We have checked above that results are not driven by this country.

baseline estimations already control for the amount of remittances sent by migrants, and we find hardly any difference in the GDP effect whether we include this variable or not. Additionally, we have run estimations of the probability to send remittances on individual characteristics and macroeconomic variable. Remitting does not significantly depend on (current or lagged) GDP. Thid, even if remitting behavior does not respond much to home country economic conditions, the implicit value of remittances may change with it. If economic conditions improve, migrants' status may decrease (and so their SWB) to the extent that their role as supporting their extended family in the origin region becomes less prominent. In fact, replicating our estimations on migrants who do not send remittances provides results that are very similar to the baseline. These various checks convey that the channel of remittances does not affect our results nor our interpretation in terms of relative concerns/deprivation.

3.4 Heterogeneity among Migrants and Additional Outputs

We now examine how the migration history of migrants and their connection to home countries may affect the results. To capture migrants' heterogeneity, we linearly interact GDP with migrants' duration of stay (YSM), then with a set of characteristics on intentions to stay in Germany, objective and subjective measures of assimilation and attachment to host versus home countries.

Duration of Stay. We first check how duration into migration influences the GDP effect. We use a flexible specification with four groups of YSM interacted with the GDP coefficient (less than 10 years, 10-20, 20-30 and more than 30 years). FE estimations with year effects do not allow the inclusion of time variable like age or YSM, so that our interaction terms would not have a clear interpretation. Therefore, we rely on QFE in this exercise. The results correspond to the blue curve in Figure 2. The effect of the home country GDP per capita is negative and very large (around $-.5$) in the first 10 years, declines a bit in the following years, then becomes virtually zero after 20 years. That the effect of the home country GDP only affects migrants' SWB in the first two decades after arrival can be interpreted as: (i) as migrants assimilate into the host country, the effect of the home country GDP as a reference group fades away; (ii) migrants who arrived young in the host countries are more assimilated and ignore their home country as a reference point. Alternative, less convincing explanations pertain to the changing composition of the migrant community due to cohort effects[22] or to return migration.[23]

[22]For instance, new comers due to family reunification would have different assimilation potentials than first round migrants attracted by bilateral guest-worker programs (cf. Borjas, 1999). Yet, we control for unobservable differences between different migrant cohorts by using arrival cohort fixed effects in our QFE estimations.

[23]Those experiencing greater relative concerns could also be more likely to eventually return to their home countries. Yet, we have seen that accounting for non-random return migration did not change our result at the

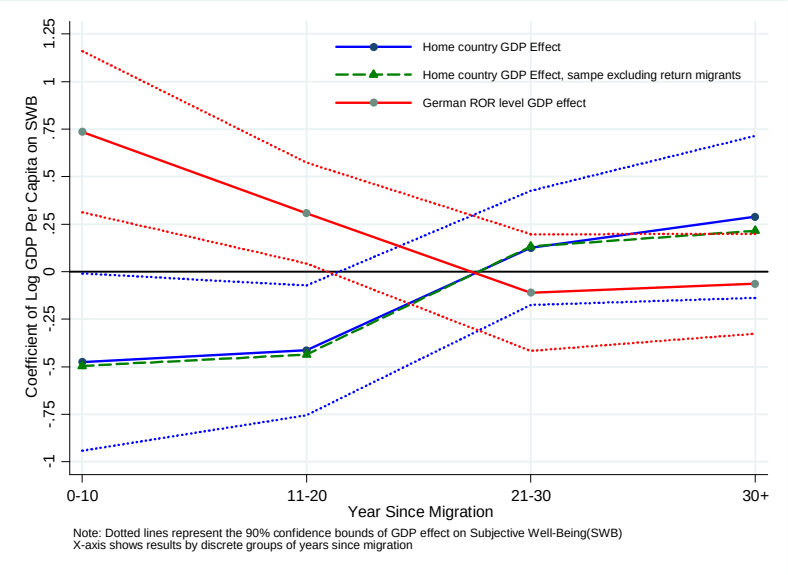

Figure 2: Effects of Home GDP versus Local German GDP on migrants' SWB according to Years-since-Migration

Assimilation and Fading Connection with Home Countries. We further explore the assimilation process that potentially explain the pattern in Figure 2. First, interpretation (ii) above suggests that relative concerns are necessarily smaller for those who arrived as a child in the host country and feel disconnected from home countries. In unreported estimations, we have interacted GDP with dummies for the age at which migrants arrived in Germany: as a child (under 12), teenager (12-18), young adults (18-39) or older. Results are not inconsistent with this explanation. While those who arrived as children are not affected by home country GDP, the GDP effect remains significant at older ages (12-18 and 18-39). Yet we cannot provide a definite answer to the question of whether stronger assimilation for people who migrated younger is due to (i) duration of exposure or (ii) exposure during a sensitive period for acculturation.[24]

Second, the assimilation process may have more implications than just "forgetting" home countries. It may also imply a switch in the reference group over time, with the *local* economic environment becoming the new natural comparator for long-term migrants. To check, this we exploit variation in economic performances across German ROR (*Raumordnungsregionen*). ROR are spatially organized unit based on various criteria to represent local markets. We match informa-

mean. Moreover, the short-dashed line in Figure 2 plots the GDP effect estimated on a sub-sample excluding all the observations for those who return to home countries at some point in the panel (930 return migrants over the period of study and 6,118 individual-year observations). The results are basically unchanged.

[24]Some evidence, provided by Cheung et al. (2011), tends to show that these mechanisms are cumulative: people are better able to identify with a host culture the longer their exposure to it, but only if this exposure occurs when they are relatively young.

tion about 96 German ROR with our micro data and regress migrants' SWB on ROR-level GDP interacted with YSM.[25] The red curve in Figure 2 shows that for short-term migrants, local GDP has a positive and significant effect. This is consistent with an interpretation in terms of *signal effect*, i.e. urban residents' higher incomes may be informative about migrants' own future income (see also, Senik, 2004; Ravallion and Lokshin, 2000; Akay et al., 2012). Yet, we observe that this effect also exhausts over time, possibly as migrants assimilate and start to consider their local environment as competitors. Interestingly, the declining (positive) signal effect is symmetrical to the decline competiting feelings vis-à-vis home countries.[26]

Third, we investigate the assimilation process in a more qualitative way. We estimate the potential heterogeneity of the GDP effect among migrants by using different proxies for their connection to home countries. We use information about the intention to migrate back (wish to stay temporarily or permanently), migrants' attachment to the host country (do you feel like a German?), whether migrants have purchased their dwelling (which may indicate a long-term commitment to stay), objective measures of socio-cultural assimilation (language skills) and on the presence of children and spouse in home versus host countries. Results are reported in Figure 3. The effect of GDP per capita on migrant SWB is ordered, for each of the questions above, from the highest to the lowest connection to the home country. Strikingly, all questions point to the same conclusion: Migrants characterized by high connection with their home lands show greater relative concerns. Admittedly, the difference with other migrants is not significant when each item is taken separately. A joint F-test of all the characteristics is however significant, and the fact that all measures point to the same direction corroborates our interpretation: those who lose touch with the home land, intentionally or not, also treat it less as a reference point. This is highly consistent with the time pattern discussed above.

Additional Outcomes. Our paper is also related to the burgeoning literature on the effect of migration on well-being. Even if migrants see their economic conditions improve, they may experience a declining SWB due to a fall in their relative position when migrating (Knight and Gunatilaka, 2012). Yet, our results suggest that a shift in reference frame may take time. Causal effects obtained by Stillman et al. (2015) thanks to a lottery randomization also show that the mere impact of migration on subjective welfare is complex, emphasizing a sensitivity of the SWB

[25] ROR information is unfortunately limited to 12 years, 1998-2009, which reduces the sample to around $21,145$ migrant-year observations (this is another reason to use QFE rather than FE in this exension).

[26] We believe that such suggestive evidence of a switch in reference groups – theoretized by Piore (1979) or Stark (1991) – is original in the literature. The study by Gelatt (2013) suggests that Latino/Asian migrants maintain simultaneous reference groups in both the US and the country of origin. Yet she does not find clear evidence of a shift in reference groups, which may be due to small sample sizes (low test power) or the fact that she cannot capture changes in reference points occurring within migrants' earliest years in the country.

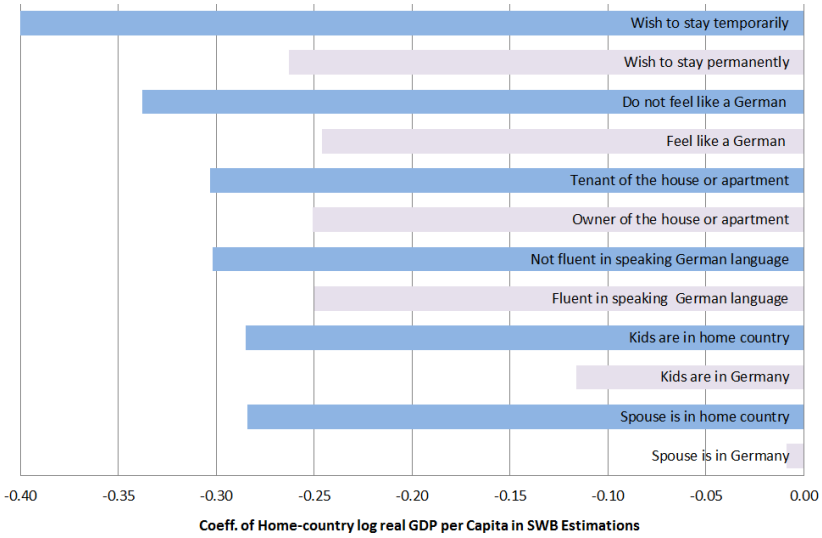

Figure 3: Effect of Home GDP on Migrant SWB: Heterogeneity

impact to the well-being measure at use. Unfortunately our dataset does not include other SWB like mental health. Additional regressions nonetheless show that domains of satisfaction (job, income, health) point to the same result as life satisfaction (a negative effect of log GDP per capita), yet with insignificant estimates. A question on whether the person is concerned with the economic environment in Germany (3-very concerned, 2-somewhat concerned, 1-not concerned at al) shows a significant response to home country log GDP per capita (p-value of 0.09). We have also explored the impact of home country GDP on behavior. While remittances and return migration are discussed above, other dimensions may be of interest. A migrant may work harder, acquire skills, etc., as a response to changes in the home country performances, possibly to improve his relative position to the "average" fellow in the home country. We indeed find that the log GDP per capita increases worked hours (p-value of 0.01) and education (the effect is significant when restricting estimations to migrants below 40 years old, with a p-value of 0.04).

4 Concluding Discussion

We investigate whether a country's macroeconomic performances matter for those who have left the country. Using various groups of migrants in Germany observed over 26 years, we find a significant and negative effect of home country GDP per capita on migrants' reported well-being. This result is well explained by positional concerns and the idea of relative deprivation of international migrants. Migrants leave their country to improve living conditions, potentially in relation to what they could have achieved in the home land. We also show that both relative concerns towards

home countries and a signal effect from migration regions are stronger upon arrival or for those with a low degree of assimilation in Germany. Both effects tend to disappear as migrants lose ties with home countries and take destination regions as new reference groups.

Our results bear some implications for migration and labor market policies. First, relative income effects suggest an original way to measure assimilation in relation to migration policy. Indeed, our approach may allow for the identification of different types of migration dynamics, as discussed in Clark et al. (2008). The modern brain drain view – and the type of workers targeted by migration policy in Canada and the US – would correspond to high skilled migrants who voluntarily migrate, quickly assimilate and rapidly switch their reference frame. Other migrants from poorer regions and less easily assimilated may keep home countries as the reference point for a longer time. The different types will have different economic and cultural implications for the host country. Second, the fact that migrants accept low-paid jobs more often than natives may be one of the contributory factors to the persistence of poverty in rich countries (Karelis, 2007). This is consistent with the fact that they essentially compare themselves to workers in (poor) home countries rather than to local workers, at least in the short run. Last, the macroeconomic conditions in the home country are one of the most important sources of information to make a cost-benefit calculation not only for initial migration decisions but also for return migration decisions. We could examine how macroeconomic conditions of home countries affect "circular migration", which is an important phenomenon of the last decade (Constant et al., 2013). As noted by Clark et al. (2008), relative concerns can also explain why migrants continue to visit their home countries: this is when they can cash in as relatively high earners compared to those in the home country.

Nonetheless, our SWB-based test of the "relative deprivation hypothesis" was only partial. We simply test whether the migrant's relative position with respect to her origin country as a whole – proxied by GPD per capita – may have an effect on her well-being (the *international* relative deprivation according to Czaika and de Haas, 2012). We could not say anything about how migration improves the relative position of a migrant or her family *within* the home country income distribution (i.e., the *internal* relative deprivation hypothesis, as described in the studies of Stark and coauthors). Interestingly, this hypothesis potentially generates further testable implications. In particular, it implies that characteristics of the migrant's home country income distribution will influence the decision to migrate (or to return). Further research should attempt to gather more specific information on a migrant's expected labor income in the home country, on her family's position within the home country distribution and on how differential income growth between host and home countries affects this position.

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A Online Appendix

A.1 Descriptive Statistics

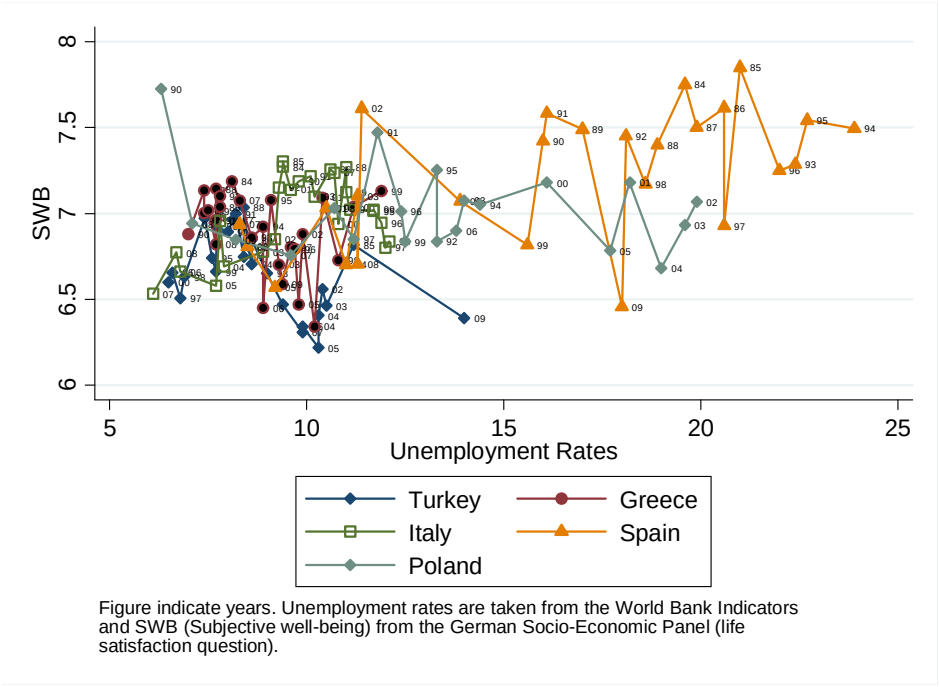

Figure indicate years. Unemployment rates are taken from the World Bank Indicators and SWB (Subjective well-being) from the German Socio-Economic Panel (life satisfaction question).

Figure A.1: SWB versus Unemployment: Time Trends

Table A.1: Statistics

Migrants from..	(Log) Real GDP	(Log) Nominal GDP	Real GDP: Country / Germany	Real GDP: Country / Germany First Wave	Real GDP: Country / Germany Last Wave	Unempl. rate (%)	SWB (0-10)	correlation SWB & GDP	correlation SWB & unempl.	# Obs. (indiv. x year)
Turkey	9.0	9.5	0.31	0.30	0.35	8.6	6.7	-0.90	-0.40	16,924
	(0.2)	(0.2)	(0.02)			(1.5)	(2.0)			
Greece	9.8	9.9	0.70	0.68	0.80	8.6	7.0	-0.64	-0.34	5,123
	(0.1)	(0.1)	(0.05)			(1.3)	(2.0)			
Italy	10.1	10.1	0.91	0.93	0.83	10.1	7.1	-0.85	0.34	7,474
	(0.1)	(0.1)	(0.02)			(1.4)	(1.8)			
Poland	9.4	9.5	0.40	0.32	0.49	14.5	7.0	-0.55	0.04	4,082
	(0.2)	(0.1)	(0.06)			(3.9)	(1.8)			
Spain	9.9	9.9	0.76	0.77	0.84	18.4	7.4	-0.86	0.56	3,139
	(0.2)	(0.1)	(0.04)			(3.6)	(2.0)			
Russia	9.2	9.5	0.34	0.49	0.44	8.7	7.3	-0.63	0.47	2,636
	(0.2)	(0.3)	(0.06)			(2.0)	(1.7)			
Kazakhstan	8.8	9.1	0.23	0.18	0.31	9.7	7.3	-0.79	0.68	2,321
	(0.3)	(0.4)	(0.06)			(2.3)	(1.6)			
Croatia	9.4	9.8	0.43	0.52	0.51	13.3	6.8	0.00	0.59	1,920
	(0.2)	(0.6)	(0.06)			(2.9)	(1.7)			
Romania	9.0	9.3	0.28	0.31	0.35	6.9	7.2	-0.14	0.09	1,754
	(0.2)	(0.2)	(0.04)			(0.9)	(1.7)			
Bosnia-Herzegovina	8.5	8.6	0.17	0.11	0.22	29.7	6.8	-0.61	-0.28	1,023
	(0.4)	(0.3)	(0.04)			(3.5)	(1.8)			
Austria	10.3	10.3	1.03	1.00	1.07	4.4	7.4	0.42	0.48	768
	(0.1)	(0.1)	(0.03)			(0.7)	(1.7)			
Czech Republic	9.8	9.9	0.61	0.64	0.69	6.5	6.9	0.12	-0.46	541
	(0.1)	(0.1)	(0.05)			(2.0)	(1.9)			
Ukraine	8.5	8.7	0.16	0.31	0.20	8.9	6.9	-0.35	0.28	515
	(0.2)	(0.4)	(0.03)			(1.9)	(1.8)			
USA	10.6	10.6	1.29	1.24	1.28	5.6	7.5	0.12	-0.21	381
	(0.1)	(0.1)	(0.04)			(1.3)	(1.6)			
France	10.2	10.2	0.93	0.95	0.90	9.7	7.0	0.09	-0.37	379
	(0.1)	(0.1)	(0.02)			(1.5)	(1.7)			
Netherlands	10.4	10.4	1.09	1.02	1.13	5.0	7.6	-0.17	-0.01	363
	(0.1)	(0.1)	(0.04)			(2.5)	(1.3)			
Hungary	9.6	9.7	0.49	0.48	0.53	6.8	6.9	0.20	0.54	320
	(0.2)	(0.1)	(0.05)			(2.6)	(2.2)			
Great Britain	10.3	10.3	0.99	0.92	1.01	6.2	7.2	-0.62	0.45	311
	(0.1)	(0.1)	(0.05)			(1.9)	(1.8)			
Macedonia	8.9	9.1	0.24	0.32	0.26	34.1	6.5	-0.12	-0.29	264
	(0.1)	(0.5)	(0.02)			(2.3)	(2.0)			
Slovenia	9.8	10.0	0.65	0.64	0.81	6.9	7.3	-0.51	0.26	248
	(0.2)	(0.2)	(0.08)			(1.2)	(1.5)			
Iran	9.1	9.2	0.28	0.24	0.31	12.3	5.8	-0.06	0.22	200
	(0.1)	(0.1)	(0.03)			(2.2)	(2.3)			
Philippines	7.9	8.0	0.09	0.09	0.10	8.6	7.3	-0.52	0.39	187
	(0.1)	(0.1)	(0.01)			(1.4)	(1.7)			
Portugal	9.9	10.0	0.67	0.63	0.65	6.2	7.5	-0.69	-0.23	170
	(0.1)	(0.1)	(0.03)			(1.7)	(1.5)			
Bulgaria	8.9	9.3	0.28	0.29	0.36	12.0	7.3	-0.07	-0.21	128
	(0.2)	(0.5)	(0.04)			(5.9)	(1.7)			
Mean / total *	9.5	9.6	0.55	0.56	0.60	10.9	7.1	-0.34 [0.46]	0.11 [-0.40]	51,171
	(0.2)	(0.2)	(0.0)			(2.2)	(1.8)			
Germany	10.28	10.29				8.50	6.99			334,308
	(0.1)	(0.1)				(1.4)	(1.8)			

Note: GDP, unemployment and subjective well-being (SWB) figures are country average over 1984-2009. GDP (2005 PPP international dollars) and unemployment rate (annual) taken from World Bank Indicators, SWB from the German Socio-Econmic Panel. Standard deviations in brackets. Correlation between SWB and GDP (or unemployment rate) are calculated over the 26 years using mean SWB for each country-year. The correlations in square brackets in the Mean/Total row reflects both time and country variation (24×26 country-year cells).

A.2 Detailed SWB Estimates

Table A.2 reports the complete set of estimates for equation (1). We distinguish between personal determinants of SWB, individual characteristics related to home countries and macroeconomic variables (here the log real GDP per capita, $GDP_{h,t}$). For simplicity, we only report three estimation methods: FE with and without country-specific time trends, QFE with these trends. All specifications control for time-varying characteristics, German state and year effects. QFE estimations additionally control for time-invariant characteristics (like gender), age and YSM, migration cohorts, home country fixed effects and the Mundlak QFE.

Results are in line with standard findings in the literature (as surveyed in Clark et al. 2008). Essentially, income, good health and being married are positively related to SWB while being unemployed is negatively correlated. The pattern of SWB over the life cycle exhibits the classic U-shaped behavior (in the QFE estimation), meaning that well-being decreases until the age of 40-45 and then increases. The presence of the kids in Germany has strong positive effects. Migrants' refugee status does affect SWB negatively. The level of remittances is negatively correlated (the loss of resources endured by the migrant dominates the gains from remitting: altruism, investment in social capital in home country, etc.) but insignificant. We have also run separate regressions for each country and find that life satisfaction estimates have a broadly common structure overall (detailed results are available from the authors). The impact of variables like age, income, health, marital status and children is very comparable and stable across countries of origin. This regularity suggests that SWB data contain reliable and potentially interesting information for welfare measurement (see also Di Tella et al., 2003).

We ignore $GDP_{h,t}$ in model 0 and add it in model I. It shows that the signs and significance of individual characteristics are not affected much by this inclusion. In model I, we obtain an estimate of the GDP effect of $-.303$, which is significant at the 1% level. Model II controls for country-specific time trends to clean out the spurious correlation between macroeconomic indices and SWB. The magnitude of the effect is basically unchanged ($-.212$) but the effect is less precisely estimated, even if still significant at the 10% level. Finally, QFE estimates with country-specific time trends also yield similar results, with a log GDP effect of $-.224$. We comment in more detail the use of alternative estimation methods in the paper and Table (A.4).

Table A.2: Subjective Well-Being Regressions with Alternative Specifications

Dep. variable: SWB	0	I	II	III
Personal characteristics				
Log of HH income	0.376 ***	0.380 ***	0.384 ***	0.398 ***
	(0.034)	(0.034)	(0.023)	(0.034)
Non-employed	-0.001	0.014	0.011	0.012
	(0.046)	(0.047)	(0.042)	(0.046)
Unemployed	-0.419 ***	-0.401 ***	-0.402 ***	-0.427 ***
	(0.057)	(0.058)	(0.047)	(0.056)
Old age/retired	0.043	0.035	0.042	-0.007
	(0.076)	(0.076)	(0.060)	(0.076)
In training/education	0.119 *	0.110	0.102	0.144 **
	(0.074)	(0.076)	(0.067)	(0.070)
Self-employed	0.033	0.033	0.027	-0.059
	(0.071)	(0.072)	(0.060)	(0.057)
Log of working hours	0.041 ***	0.044 ***	0.044 ***	0.045 ***
	(0.012)	(0.012)	(0.011)	(0.012)
Age/100				-3.729 ***
				(0.814)
Age squared				2.152 **
				(0.843)
Years since migration (YSM)				0.803
				(1.145)
YSM squared				-1.449
				(1.373)
Female				0.138 ***
				(0.034)
Separated (1)	-0.394 ***	-0.407 ***	-0.410 ***	-0.503 ***
	(0.098)	(0.100)	(0.065)	(0.087)
Single (1)	-0.216 ***	-0.237 ***	-0.224 ***	-0.175 ***
	(0.065)	(0.066)	(0.046)	(0.050)
Divorced (1)	-0.208 **	-0.219 **	-0.231 ***	-0.365 ***
	(0.101)	(0.103)	(0.070)	(0.078)
Widowed (1)	-0.571 ***	-0.578 ***	-0.596 ***	-0.557 ***
	(0.130)	(0.135)	(0.094)	(0.094)
Health: poor (2)	0.709 ***	0.705 ***	0.702 ***	0.765 ***
	(0.054)	(0.054)	(0.037)	(0.053)
Health: average (2)	1.290 ***	1.287 ***	1.283 ***	1.394 ***
	(0.056)	(0.056)	(0.036)	(0.055)
Health: good (2)	1.776 ***	1.779 ***	1.773 ***	1.955 ***
	(0.058)	(0.058)	(0.037)	(0.055)
Health: very good (2)	2.255 ***	2.257 ***	2.253 ***	2.516 ***
	(0.062)	(0.062)	(0.039)	(0.059)
Log of HH size	-0.292 ***	-0.313 ***	-0.308 ***	-0.335 ***
	(0.053)	(0.053)	(0.037)	(0.051)
Years of education	-0.010	-0.010	-0.008	-0.001
	(0.012)	(0.012)	(0.009)	(0.012)
Personal characteristics related to origin country				
One children with the migrant	0.096 ***	0.093 ***	0.092 ***	0.116 ***
	(0.033)	(0.034)	(0.027)	(0.030)
Two children with the migrant	0.125 ***	0.129 ***	0.127 ***	0.163 ***
	(0.042)	(0.043)	(0.033)	(0.039)
More than two children	0.208 ***	0.223 ***	0.218 ***	0.261 ***
	(0.057)	(0.057)	(0.042)	(0.051)
Spouse in home country	-0.435 ***	-0.496 ***	-0.486 ***	-0.457 ***
	(0.140)	(0.144)	(0.092)	(0.113)
Other relative in home country	0.001	-0.011	0.009	-0.043
	(0.090)	(0.089)	(0.087)	(0.045)
Migrant is a refugee	-0.184 **	-0.143 *	-0.141 *	-0.014
	(0.082)	(0.083)	(0.084)	(0.049)
Log of remittances	-0.006	-0.005	-0.005	-0.005
	(0.010)	(0.010)	(0.008)	(0.010)
Macroeconomic conditions				
GDP		-0.303 ***	-0.212 *	-0.224 *
		(0.107)	(0.125)	(0.138)
Individual effects (a)	FE	FE	FE	QFE
Cohort fixed effects (b)	n.a.	n.a.	n.a.	Yes
State effects (c)	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Home country fixed effects	n.a.	n.a.	n.a.	Yes
Home country linear time trend	No	No	Yes	Yes
R2	0.141	0.140	0.141	0.285
# observations	47,557	47,557	47,557	47,557

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. Estimations performed on migrants from 24 countries over 26 years, standard errors clustered at the individual level. GDP refers to log of real GDP per capita, taken from World Bank indicators. Subjective well-being (SWB) taken from the German Socio-Economic Panel. All models include the full set observed characteristics reported in appendix Table A.2 (time-invariant characteristics, age and years-since-migration not used with FE model including year effects). (1) Omitted category is 'married'. (2) Omitted category is 'very poor health'. (a) Unobserved individual effects are taken into account using fixed effects (FE) or quasi-fixed effects (QFE). Other individual effects are: (b) 10 arrival cohort effects (used with QFE only) and (c) 16 federal states of Germany.

A.3 Estimations on Grouped Data

Grouped data estimation is an alternative to estimations on individual migrant observation. We use a sample of 556 country×year points,[27] taking the mean SWB over all migrants in a country-year cell as dependent variable. The model becomes:

$$\overline{SWB}_{ht} = \overline{X}_{ht}\alpha + \gamma Macro_{ht} + \theta_t + t \times \delta_h + \delta_h + \overline{Z}_h + \overline{Age}_{ht} + \overline{YSM}_{ht} + \varepsilon_{ht}$$

where $\overline{SWB}_{ht}$ is the mean subjective well-being over all migrants of origin country h in year t, $Macro_{ht}$ the home country macroeconomic variable (we focus on log real GDP per capita, $GDP_{h,t}$, and unemployment hereafter), $\overline{X}_{ht}$ a set of mean characteristics of migrants from country h observed in year t (the characteristics listed in Table A.2) and $\overline{Z}_h + \overline{Age}_{ht} + \overline{YSM}_{ht}$ the means of gender and cohorts, age and years-since-migration. The composite error term includes time trends θ_t (for any global shocks that are common to all countries in each year), country-specific time trends $t \times \delta_h$ (cultural attitude toward changes in well-being or country-specific unobservable assimilation patterns of migrants of country h), home country fixed effects δ_h (for unchanging cultural influences of origin country on reported well-being), and a usual i.i.d error term, ε_{ht}. Regressions are weighted by cell sizes to account for the larger representation of some migrant groups in the data and to make them more comparable to regressions on individual data. This grouped data estimation is similar to the micro data estimations when assuming that individual FE φ_i average up to $\delta_h + \overline{Z}_h + \overline{Age}_{ht} + \overline{YSM}_{ht}$ (or, compared to QFE estimations in which we explicitly include δ_h, Z, Age, YSM, that the QFE u_i is zero on average in each country×year cell). The likely departure from these assumptions will explain the difference with micro estimates.

Effect of GDP. In Table A.3, we simply report estimates for γ, which is the impact of the macroeconomic variables on SWB. Column I reports the coefficient on $GDP_{h,t}$. The parameter estimate is negative and highly significant, with a magnitude of $-.565$. Hence, it is confirmed that an increase in the home country's GDP per capita is negatively correlated with migrants'

[27] We do not have observations in GSOEP for 1 year (5, 5, 6 and 10 years) in Iran (Portugal, Russia Ukraine and Kazakhstan respectively), which makes 27 country × year observations missing. We have checked that the conclusions of this study hold when excluding these countries completely. In addition, macroeconomic variables are not reported in World Bank Indicators for 6 years in Poland, Slovenia, Macedonia, Croatia and the Czech Republic, 1 year for Russia and 10 years for Bosnia, leading to another 41 missing points. Again, we have verified that our results are consistently similar when using linear extrapolation or other sources to fill in the missing GDP or unemployment information. Our baseline nonetheless relies on the original sample. The total of 68 missing points corresponds to 10.9% of the $26 \times 24 = 624$ country × year sample used for grouped estimations below. This proportion is smaller in terms of individual×year observations (7.1%) due to the fact that missing points affect countries that are below the average country size.

well-being, conditional on country and year fixed effects. Column II departs from the assumption of common linear time trends for all countries by adding $t \times \delta_h$.[28] As in micro estimates, the coefficient becomes a little bit smaller but the relationship between $GDP_{h,t}$ and SWB is hardly affected. The coefficient, $-.472$, is significant and gives a 95% confidence interval of $[-.99, .04]$. Corresponding regressions on individual migrant data (columns II and V of Table A.4) yield overlapping intervals of $[-.457, .033]$ and $[-.479, .031]$ in the case of FE and QFE respectively.

Effects of Unemployment. Our relative concerns/deprivation interpretation could apply to other macroeconomic variables and notably to unemployment. Market failures that constrain labor market and earnings opportunities in the home land may increase the attractiveness of migration both as a potential avenue for effective gains in relative incomes and a source of satisfaction for those who have already migrated. Column III in Table A.3 presents the effect of the home-country unemployment rate. This effect is significantly positive, which is consistent with the interpretation above and the findings regarding GDP. This effect is robust to controlling for home country-specific time trends (column IV). When including $GDP_{h,t}$ in the same regression (unreported), both home country log GDP per capita and unemployment effects keep the sign and magnitude that they had in independent estimations.

[28] This is a necessary check, as argued by Di Tella et al. (2003). Indeed, as macroeconomic indices such as GDP are time-trended while SWB is usually untrended (Easterlin, 1995), regressing the latter on the former generates concerns of costationarity. In our sample of migrants, we have observed a small downward trend in life satisfaction. We nonetheless account for time trends θ_t in the estimation to reduce this concern. Including country×year effects – and hence accounting for possible differences in slope across source countries – should eliminate it. Note also that the GDP effect could be spurious if country-specific time effects, and in particular the effect of YSM, were misspecified and picked up by the GDP trend. While country-specific time trends eliminate this, we have checked that our results are not sensitive to using flexible specifications of YSM in a model without country-specific time effects.

Table A.3: Effect of Home-Country Macroeconomics on Migrant SWB: Grouped Estimations

SWB grouped estimations	I	II	III	IV
GDP	-0.565 ***	-0.472 *		
	(0.202)	(0.263)		
Unemployment rate			0.040 ***	0.030 ***
			(0.010)	(0.011)
Year effects	Yes	Yes	Yes	Yes
Home country fixed effects	Yes	Yes	Yes	Yes
Home country linear time trends	No	Yes	No	Yes
GDP (equivalent income)	-1.45	-1.21		
R2	0.637	0.685	0.587	0.673
# observations	556	556	556	556

Note: *, ** and *** indicate significance levels at 10%, 5% and 1% respectively. GDP refers to log of real GDP per capita. GDP and unemployment rates taken from World Bank indicators. Subjective well-being (SWB) averaged per country of origin x year, taken from the German Socio-Economic Panel. Linear estimations performed on migrants from 24 countries over 26 years, weighted by countryxyear cell size. All models include the mean value (for each country x year) of characteristics reported in appendix Table A.2 ind. mean cohort and state effects.

A.4 Estimations on Micro Data: Additional Results

Table A.4: Effect of Home-country GDP on Migrant SWB: Micro Data

SWB micro estimations	I	II	III	IV	V	VI	VII
GDP (coefficient)	-0.303 ***	-0.212 *	-0.490 ***	-0.281 ***	-0.224 *	-0.321 ***	-0.215 ***
	(0.107)	(0.125)	(0.181)	(0.104)	(0.130)	(0.122)	(0.057)
Individual effects (a)	FE	FE	FE	QFE	QFE	QFE#	QFE
Cohort fixed effects (b)	n.a.	n.a.	n.a.	Yes	Yes	Yes	Yes
State effects (c)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Home country fixed effects	n.a.	n.a.	n.a.	Yes	Yes	Yes	Yes
Home country linear time trends	No	Yes	No	No	Yes	No	No
Estimation method	linear	linear	ologit	linear	linear	linear	oprobit
GDP (equivalent income)	-0.797	-0.553	-0.972	-0.714	-0.562	-0.860	-0.689
R2 or pseudo-R2	0.140	0.141	0.103	0.284	0.285	0.305	0.085
# observations	47,557	47,557	47,557	47,557	47,557	25,306	47,557

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. Estimations performed on migrants from 24 countries over 26 years, standard errors clustered at the individual level. GDP refers to log of real GDP per capita, taken from World Bank indicators. Subjective well-being (SWB) taken from the German Socio-Economic Panel. All models include the full set observed characteristics reported in appendix Table A.2 (time-invariant characteristics, age and years-since-migration not used with fixed effects). (a) Unobserved individual effects are taken into account using fixed effects (FE), quasi-fixed effects (QFE) or QFE & big-five personality traits (QFE#). Other individual effects are: (b) 10 arrival cohort effects (used with QFE only) and (c) 16 federal states of Germany.

Table A.5: Effect of Home-country Unemployment on Migrant SWB: Micro Data

SWB micro estimations	A	B	C	D	E	F	G
Unemployment rates	0.011 ***	0.009 **	0.006	0.005	0.002	0.007	0.009
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.006)	(0.007)
Unemployment rate (t-1)						-0.002	0.005
						(0.006)	(0.009)
Unemployment rate (t-2)							-0.011
							(0.007)
GDP		-0.374 ***			-0.417 ***		
		(0.115)			(0.148)		
Individual effects (a)	No	No	QFE	FE	FE	FE	FE
Cohort fixed effects (b)	Yes	Yes	Yes	n.a.	n.a.	n.a.	n.a.
State fixed effects (c)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Home country fixed effects	Yes	Yes	Yes	n.a.	n.a.	n.a.	n.a.
R-squared	0.289	0.289	0.284	0.139	0.139	0.140	0.139
#Observations	47,557	47,557	47,557	47,557	47,557	47,398	47,231

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. Linear estimations performed on migrants from 24 countries over 26 years. All models include the full set observed characteristics reported in appendix Table A.2. Unemployment rates and GDP (referring to log of real GDP per capita) are taken from World Bank indicators. Subjective well-being (SWB) taken from the German Socio-Economic Panel. Other controls include: (a) Unobserved individual effects modeled as quasi-fixed effects (QFE) or fixed effects (FE), (b) 10 arrival cohort effects, (c) 16 federal states of Germany.

A.5 Return Migration

We use the Heckman procedure adapted to panel data by simultaneously estimating selection into return migration and the SWB equation by Maximum Likelihood (for a more structural approach, see Bellemare, 2007). Ideally, the selection equation should contain an instrument explaining variation in migrants' likelihood to return but uncorrelated with (conditional) migrants' SWB. There is no obvious variable of the kind, as virtually everything can potentially affect well-being. We use a first series of instruments based on the migrant's declared intention to stay in Germany (contemporaneous, lagged and time change of this intention). We also use the average intention to stay over all migrant's household members (also as contemporaneous, lagged or time difference), which is expected to be more exogenous but possibly less relevant as an instrument. Columns 2 in Table A.6 report the effect of the different instruments on the propensity to return. All instruments have a significant impact and the expected sign (F-tests pass the threshold of 10 commonly used for checking if instruments are weak). Column 3 reports the effect of $GDP_{h,t}$ on the probability of return: it is positive but insignificant. As discussed in the text, column 1 shows that SWB regressions controlling for selection into return migration yield very similar GDP effects as the baseline. The correlation ρ between the residuals of the two equations is significantly different from zero only when the instrument used is the contemporaneous intention to stay (the migrant's intention or the mean answer for her family), which denotes the possible role of unobservable shocks affecting simultaneously well-being and the current intention to return.

Table A.6: SWB Estimations Corrected for Selection into Return Migration

SWB estimation with Heckman correction for return migration	SWB equation	Propensity to return equation			
	Coeff. on GDP	Coeff. on instrument	Coeff. on GDP	Rho	# obs.
Instrument: Migrant's intention to stay					
Intention (t)	-0.245 ***	-0.395 ***	0.065	0.085 **	47,568
	(0.095)	(0.019)	(0.134)	(0.036)	
Intention (t-1)	-0.314 ***	-0.336 ***	0.116	0.007	40,961
	(0.099)	(0.021)	(0.146)	(0.036)	
Intention (t) - Intention (t-1)	-0.316 ***	-0.064 ***	0.094	-0.005	40,961
	(0.099)	(0.021)	(0.145)	(0.038)	
Intention (t-1) - Intention (t-2)	-0.254 **	-0.052 **	0.100	-0.021	35,664
	(0.105)	(0.022)	(0.157)	(0.043)	
Instrument: mean intention to stay of migrant's household					
Intention (t)	-0.249 ***	-0.460 ***	0.071	0.062 *	47,568
	(0.095)	(0.021)	(0.135)	(0.034)	
Intention (t-1)	-0.316 ***	-0.397 ***	0.123	-0.008	40,961
	(0.099)	(0.023)	(0.146)	(0.035)	
Intention (t) - Intention (t-1)	-0.316 ***	-0.086 ***	0.092	-0.005	40,961
	(0.099)	(0.024)	(0.145)	(0.038)	
Intention (t-1) - Intention (t-2)	-0.254 **	-0.066 ***	0.099	-0.021	35,664
	(0.105)	(0.026)	(0.157)	(0.043)	

Note: *, **, *** indicate significance levels at 10%, 5% and 1% respectively. SWB equation estimated linearly on microdata using baseline specification and additionally accounting for Heckman correction for non-random selection into return migration (ML estimation). Selection based on a dummy variable for return migration. Different rows report results for alternative instruments in the selection equation. Instruments are based on the migrant's intention to stay or her household mean intention to stay. Rho is the correlation between the two equations.