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Do Methodical Traps lead to wrong Development Strategies for Welfare? A Multilevel Approach Considering Heterogeneity across Industrialized and Developing Countries

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ABSTRACT:

Subjective well-being (SWB) is becoming increasingly important as welfare concept in both scientific research and politics, as it comprises additional welfare aspects compared to the GDP per capita. Consequently, it becomes important to explicitly identify its driving forces and clarify still ambivalent findings of the literature. For this purpose, with a multilevel model we investigate the extent to which individual-level and national variables together influence subjective well-being. Moreover, we expect that life satisfaction of people in developing countries is determined differently than life satisfaction of people in industrialized countries.

The database used includes both individual and national variables and is split into two subsamples of 40 industrialized countries and 41 developing countries. The results show that the national environment is highly important for a person's SWB. Thus, neglecting this national level would generate biased estimates. Moreover, the split into industrialized and developing countries shows that statistically significant and substantial differences in the effects on life satisfaction exist. Important differences are found for example regarding the income variables. We identify a saturation effect of income on the individual level, whose level is however different depending on the development status of the countries. Moreover, on the aggregated level a significant impact of GDP per capita is found for the developing but not for the industrialized countries. Thus, this study indicates that multilevel modelling approaches are necessary to obtain robust results and that the impact of macroeconomic variables diverges in dependence of the country's development status.

Keywords: Subjective well-being, life satisfaction, developing vs. industrialized countries, institutional quality, multilevel modelling

JEL: D6, I31, O1, O2

1 Introduction

Subjective well-being (SWB), happiness and life satisfaction are by now already established subjects of scientific analyses in various disciplines like sociology, psychology or economics. In recent years, however, the topic has additionally raised the political awareness as a more comprehensive welfare indicator than the GDP related measures. The start was eventually made by Bhutan, where the Gross National Happiness (GNH) was defined as an important measure for quality of life and as a central target for the politics of the country (Biswas-Diener et al., 2015; Burns, 2011). In recent years, also European countries have seized the idea of a more comprehensive understanding of welfare. For this purpose, the French government has installed the "Commission on the Measurement of Economic Performance and Social Progress (CMEPSP)" (Stiglitz et al., 2009) and Germany the Enquete-Commission "Growth, Welfare and the Quality of Life" (Deutscher Bundestag, 2013). Moreover, the European Commission has implemented the "Beyond GDP" initiative in order to develop welfare indicators that not only consider economic aspects like the GDP but also environmental and social issues for the measurement of well-being[1].

The ongoing interest for SWB has consequently intensified not only the search for the important driving forces of SWB but also for possibilities to govern some of these driving forces in order to enhance SWB. As Kőszegi and Rabin (2008) state, "a central focus of Economics has always been to understand how economic behavior and institutions affect well-being" (p. 1821). Thus, the corresponding literature has investigated the influences of various macro-economic factors on SWB, like unemployment rate, inflation rate but also shocks like privatizations and currency devaluations (Bonnet et al., 2012; Hariri et al., 2015). A special emphasis of economists is on the influence of GDP per capita on SWB, as a strong economy is one of the central targets of political institutions. Thus, the impact of GDP, interpreted as income, on SWB is an often discussed topic of scientific analyses and treated commonly with reference to the so-called "Easterlin Paradox" (Easterlin and Angelescu, 2009; Graham, 2005; Hariri et al., 2015; Stevenson and Wolfers, 2008).

The results on the relationship between income and SWB are rather ambivalent. Scientists have found empirical evidences for a non-significant relationship (Pierewan and Tampubolon, 2014; Puntscher et al., 2015), a linear relationship (Bjørnskov, 2003; Diener et al., 2013; Ram, 2010), a log-linear relationship (Di Tella and MacCulloch, 2010; Hooghe and Vanhoutte, 2011; Kahneman and Deaton, 2010; Stevenson and Wolfers, 2013) as well as the existence of a satiation effect (Caporale et al., 2009; Frey and Stutzer, 2002a; Kroll, 2008).

In this study, we suggest that these different evidences arise mainly (1) due to the isolated consideration of the individual and the overall social level and/or (2) due to heterogeneity between countries of different levels of development. Both problems lead to questionable estimates, which do not allow to

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[1] More details can be found on http://ec.europa.eu/environment/beyond_gdp/indicators_wellbeing_en.html.

draw conclusions regarding developing strategies. It may be apparent to focus the analyses either on the individual level or on the institutional level and, indeed, most publications follow such a single level approach. However, it is well known by now that analyses, which consider only one single observation level although more observation levels have a significant influence, might provide severely biased results. This phenomenon is known as ecological fallacy for aggregated data (Clark and Avery, 1976; Robinson, 1950; Tranmer and Steel, 1998). Further, the literature has also shown that analyses working solely with individual data might generate misleading results, if an influential aggregated level is ignored (Puntscher et al., 2016; Subramanian et al., 2009; Tranmer and Steel, 2001). This issue should clearly be considered for the discussion about welfare, as well-being is undoubtedly affected by both individual aspects, like health, and nation-specific institutional properties, like educational or health system. From this it follows, that both the individual and the national level have to be modelled simultaneously in order to assess the actual influences. Otherwise, we would face a missing variable problem including all known consequences.

Thus, similar to Helliwell and Putnam (2004) or Aslam and Corrado (2012) a two-level model using individual and national data is applied in this study based on a worldwide dataset from the World Values Survey (WVS, 2015) and the European Values Study (EVS, 2011). This approach allows considering variables of both observation levels simultaneously and, thus, avoiding the previously mentioned statistical issues. This two-level approach is, however, more than just a methodical choice. It rather contributes also to the further discussion on SWB. The consideration of similar aspects on the individual and the national level, like the personal income situation and GDP p.c. or the personal employment situation and the overall unemployment rate, allows to quantify the importance of different transmission mechanisms.

For this purpose, we further differentiate the potential factors with respect to their different impact on both observation levels. Moreover, not all factors can be influenced by external or manageable measures, as they are (in the short term) unchangeable personal or cultural characteristics. Thus, we classify the impact factors also with regard to the extent to which they can be influenced actively with institutional development strategies. According to the degree of governable influence, the impact factors of SWB identified in the literature can be roughly divided into four groups:

1. **Personal characteristics**, which cannot be manipulated from outside, like gender or age of a person.
2. **Latent Personality traits**, which aim at covering psychological characteristics of a person like extraversion or self-esteem. The probably best-known examples for such traits are the Big 5 factors (Binder and Freytag, 2013; De Neve and Oswald, 2012; Siedlecki et al., 2013).
3. Observable, **individual-level properties** of a person, which may be political targets like education, marital status, income or the involvement with the civil society.
4. **National or regional attributes** of the social and political environment of a person, like GDP per capita, income distribution, unemployment rate, quality of the institutional environment.

Evidently, the first two groups of impact factors (personal characteristics and personality traits) are inherent to a person and can hence not or only hardly be influenced by public policy instruments. On the other hand, the groups three and four comprise driving forces, which might be tractable to different degrees. The marital status, for example, can hardly be seen as a changeable socio-political parameter, even if some countries try to influence this status by providing for example special tax reductions to married couples. In contrast, the education level, the quality of public institutions or the unemployment rate are classic targets of economic and socio-political measures.

Besides the assumption that individual variables have to be considered together with macro-variables, we expect that life satisfaction of people in developing countries is determined differently than life satisfaction of people in industrialized countries. Kingdon and Knight (2007) found evidence that for poor people the greatest concern is to meet their basic physical needs whereas non-poor people are more concerned with their position and achievement in relation to society. Besides the specific impact of income, Conceição and Bandura (2008) summarize in their literature review that "criticism is directed on the use of the same methodology for industrial and developing countries alike, when both groups of countries have distinct characteristics and place different weights on issues." (p 4). Bjørnskov et al. (2008) are concerned about a possible change in the results "if the sample would be restricted to relatively poor countries" (p. 167). Still few studies are available concerning developing countries (Hinks and Gruen, 2007; Stevenson and Wolfers, 2008; Sulemana et al., 2016; Tiliouine, 2009), or for a review cf. Clark and Senik (2015)). Comparing the findings therein the important question remains whether the impacts are that diverse across the two country groups so that this heterogeneity has to be considered in the modelling approach in order to avoid misspecification.

Hence, the present study contributes to the research on SWB by discussing the following research questions:

1. Does a person's macro-environment (e.g. economy, institutions) affect her level of subjective well-being substantially? If so, for what institutions can we find evidence?
2. Is there evidence that some contradictions in the empirical findings of the current literature arise due to the restrictions of the analyses on a single observation level?
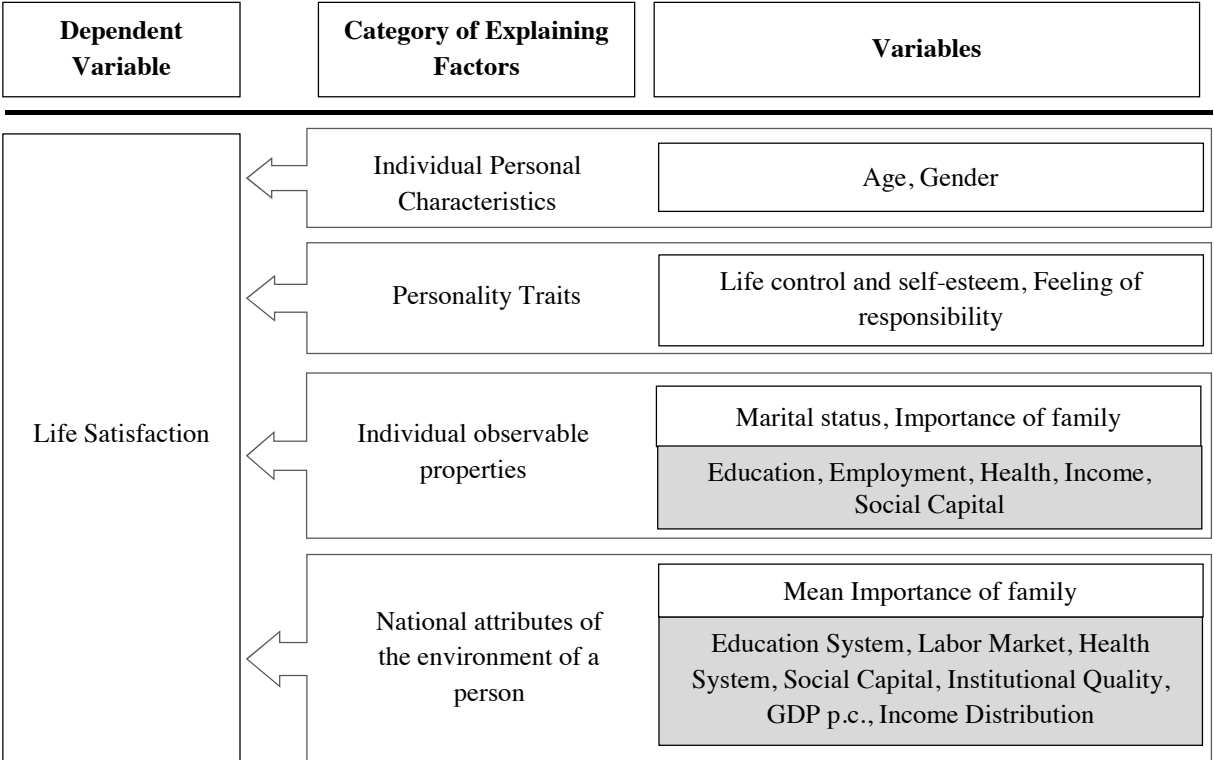   This research question will be discussed using the example of the relationship between income and SWB, as income provides particularly controversial results with an ongoing dispute about its impact (Di Tella and MacCulloch, 2008; Diener et al., 2013; Easterlin, 1974; Frey and Stutzer, 2002b; Sacks et al., 2013; Stevenson and Wolfers, 2013; Veenhoven and Vergunst, 2014). How important is the influence of the income distribution compared to the level of the average income?
3. Do the same driving forces affect life satisfaction similarly in industrialized nations and in developing countries? Alternatively, what are the main differences?

The further structure of the paper is as follows: Section 2 describes the data used for the empirical analyses and the employed methodology. Subsequently, Section 3 presents the results, while Section 4 discusses the corresponding findings based on the conclusions of previous research and provides a perspective of possible subsequent analyses.

2   Data and Methodology

An overview of the underlying theoretical considerations is illustrated briefly in Figure 1. The variables considered are classified in accordance to their degree of external possibilities of control or regulation and are described in detail below.

Dependent Variable	Category of Explaining Factors	Variables
Life Satisfaction	Individual Personal Characteristics	Age, Gender
	Personality Traits	Life control and self-esteem, Feeling of responsibility
	Individual observable properties	Marital status, Importance of family
		Education, Employment, Health, Income, Social Capital
	National attributes of the environment of a person	Mean Importance of family
		Education System, Labor Market, Health System, Social Capital, Institutional Quality, GDP p.c., Income Distribution

Note: Grey shaded areas regarding the variables comprise attributes that may be influenced by public policy instruments; white areas illustrate characteristics that are more or less intrinsic values of a person.

FIGURE 1
Model Framework Overview

2.1. Data

The data applied for the analyses come from different sources. For the individual level, we use a pooled dataset, which combines the two currently most recent waves 5 and 6 of the World Values Survey (WVS, 2015) from 2009 and 2014 with the latest wave 4 of the European Values Study (EVS) conducted in 2008-2010 (EVS, 2011). The national variables considered are gathered from the database of the World Bank (http://data.worldbank.org/indicator), the Global Competitiveness Index (GCI) of the World Economic Forum (http://reports.weforum.org/global-competitiveness-report-2014-2015/) and the Standardized World Income Inequality Database (Solt, 2014).

Our final pooled dataset with all individual and national variables includes 138,362 individual observations from 81 worldwide nations. For the further following analyses, this overall dataset is divided into two subsamples with respect to the income level of the countries following the categorization of the World Bank[2]. Consequently, we distinguish between "developing countries", i.e. countries defined by the World Bank as low income, lower middle income and upper middle income on the one hand, and "industrialized countries", i.e. countries categorized by the World Bank as high income on the other hand. The subsample "developing countries" includes consequently 68,864 individuals in 41 countries and the second subsample "industrialized countries" summarizes 69,498 individuals in 40 countries.

The central concept of this study, subjective well-being, is defined as "broad category of phenomena that include people's emotional responses, domain satisfactions, and global judgments of life satisfaction" (Diener et al. (1999); p. 277). Therefore, indicators for SWB commonly used in the research are the individually reported level of life satisfaction and happiness. Arguments in favor of the use of these indicators and their comparability across nations are presented amongst others by Di Tella and MacCulloch (2005), Di Tella and MacCulloch (2006), Veenhoven (2008) and Minkov (2009). Thus, following the current literature (Anand et al., 2011; Aslam and Corrado, 2012; Bjørnskov et al., 2013; Layard et al., 2008), we measure individual subjective well-being (SWB) with the survey question proposed in the WVS and EVS: "How satisfied are you with your life?" This question measures life satisfaction on a 10-point Likert scale ranging from 1, completely dissatisfied, to 10, completely satisfied. The dependent variable *Life Satisfaction* is treated as continuous as done in the current literature (Frey and Stutzer, 2002a; Helliwell and Putnam, 2004; Pierewan and Tampubolon, 2014; Puntscher et al., 2015). On the other hand, the explaining ordinal, categorical individual variables or the ones measured on a scale like income, health, education, employment or marital status are included with dummy variables for each single scale in order to allow for potential non-linear influences. Thus, for example individual income is considered with nine dummy variables representing the perceived income categories and with the first scale as reference category.

The two commonly considered personal characteristics, namely gender (1 = male, 0 = female) and age of the respondent, are included in the analyses. A quadratic relationship with respect to age is modelled, as earlier research indicates that SWB follows a life cycle with higher levels for younger and older people (Blanchflower and Oswald, 2004; Blanchflower and Oswald, 2008; Di Tella and MacCulloch, 2005).

Further, personality traits may be responsible for a part of SWB. If they are not considered econometrically, their influence may be contributed erroneously to included economic variables. Helliwell and Putnam (2004) argue, for example, that unemployment is "likely to represent much more than a loss of income, perhaps reflecting the loss of workplace social capital as well increases in family

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[2] For more information, please refer to http://data.worldbank.org/about/country-and-lending-groups.

stress and individual loss of self-esteem." (p. 1440). Therefore, an indicator for the perception of life control and free choice is included in the analyses, which is interpreted as a measure of self-confidence of the respondent. The variable employed asks for how much freedom of choice and control the respondent feels to have over the way his or her life turns out. The answer is coded on a 10-point Likert scale, where 1 means "no choice at all" (reference category) and 10 means "a great deal of choice". Additionally, the view of the respondent on the division of responsibility between government and each person is included. The respondent can choose whether the "Government should take more responsibility to ensure that everyone is provided for" (= 10; reference category) or rather "People should take more responsibility to provide for themselves" (= 1). This can be seen as a proxy for the understanding of personal responsibility and self-reliance.

The third category of driving forces comprises sociodemographic properties of a person that can be (partially) influenced by the environment, the society or the government. This includes marital status, perceived importance of family, achieved education, employment status, income level, health status, participation in associations and the general and institutional trust of a person.

The first two indicators of this group are variables regarding family ties, which can hardly be manipulated from the outside by some socio-political measures. The marital status is divided into six classifications, which are again considered as binary variables in the models: „Single/never married" is used as reference category, the further dummy variables are consequently „married", „living together", „divorced", „separated" and „widowed" (Caporale et al., 2009; Levinson, 2012). Further, a dummy variable measures the importance of family for the respondent (1 = very important; 0 = otherwise).

The institutional and political environment of a person can indeed influence the remaining individual-level impact factors of SWB (highlighted with grey shaded rectangles in Figure 1). The education of a respondent is measured on the individual level using a reduced 5-scale ISCED classification with four dummy variables included in the estimation. The categories range from the reference category, i.e. people without any formal education, "Incomplete (compulsory) elementary education" to the highest educational level "University with degree". Education is commonly employed in the literature, but its effect on SWB is not stable as it is found to be responsive to the consideration of other variables like income, health, intelligence or motivation (Dolan et al., 2008). Helliwell and Putnam (2004) consider education as a variable having no direct impact on SWB especially if the health status is implemented in the model.

The labor market is considered with a person's employment status as indicated in the WVS/EVS dataset. Thus, we differentiate between „Full Time employment", which is the reference category, „Part-time employment", "Self-employed", "Retired", "Homemaker", "Students", "Unemployed" and "other". Additionally, we hypothesize that the employment status "part-time employed" has a stronger (negative) impact on the life satisfaction of men than of women due to classical gender role models and the

corresponding expectations of a society. This hypothesis is tested with an interaction term between the employment status "Part-time employed" and the gender variable.

Based on the data provided by the WVS/EVS dataset, we analyze the income effect with a variable about the personal evaluation of one's own income situation measured on a 10-point scale. As already mentioned above, income is considered with nine dummy variables, where the reference category is the lowest scale. This flexible modelling is especially important for income, as the literature has already shown that the effect of income seems to be non-linear (Diener et al., 2010; Kroll, 2008; Layard et al., 2008).

Based on earlier findings in the literature (Aslam and Corrado, 2012; Ferreira et al., 2013; Helliwell and Putnam, 2004; Levinson, 2012), we expect a strong influence of the health status on SWB. In order to measure health, we rely again on the subjective perception of the respondent's health status as provided by the WVS/EVS dataset. This indicator is coded on a 5-point Likert scale ranging from "very poor health" (= 1) to "very good health" (= 5). The reference category applied is "very good health".

This category of explaining variables includes also three already well-known indicators on social capital, i.e. active membership in associations, general and institutional trust. Bjørnskov et al. (2010) and Portela et al. (2013) have shown amongst others that social capital variables are important impact factors on an individual level. Moreover, Bjørnskov (2008), Kroll (2008) and Puntscher et al. (2015) have also found a significant influence of aggregated social capital on SWB. Therefore, these indicators on social capital are included in the model both as individual variables and as national mean. We follow the approach of Puntscher et al. (2016) and include on the individual level the mean-centered indicators, i.e. the deviation of the individual value from the corresponding national mean value. This provides immediately the within and between estimates and their significance (cf. methodology section).

General trust is measured with the by now traditional question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" (1 = Most people can be trusted, 0 = can't be too careful) (Glaeser et al., 2000; Rohner et al., 2013). The second indicator is the number of active memberships in voluntary organizations like sports clubs, environmental organizations or music groups (Winkelmann, 2009). Additionally, the trust of the respondent in the political system and in the public administration is considered (Clausen et al., 2011; Ligthart and van Oudheusden, 2015). These measures can be seen as the perceived quality of public organizations regarding political system and public administration, as "public organisations must also inspire confidence in those they serve" (Clausen et al. (2011), p. 212). These indicators are obtained via principal component analysis (PCA). Thus, three resp. four variables on the confidence of the respondents in different institutions on a 4-point Likert Scale (1 = none at all; 4 = a great deal) are included in the PCA. The component loadings are exhibited in Tables A.1 and A.2 in the Appendix A. The first PCA condenses the three variables about the confidence in parliament, government and political parties and generates a standardized component called *Confidence in the Political System*. This

PCA explains 75.66% of the total variance in all processed items and exhibits a highly significant chi-square statistic and Kaiser-Mayer-Olkin criterion of 0.724. The second PCA comprises the statements on the confidence in justice system/courts, civil services, police and armed forces. Again, a highly significant Bartlett's test of Sphericity and a KMO-Measure of 0.756 confirm the adequacy of this PCA, which generates the component *Confidence in Public Administration*.

As already emphasized, we consider a person as part of a community and, thus, embedded into her social and institutional framework. Therefore, the fourth and last category of explaining variables describes the national environment of the respondents.

Similar to the individual level, the institutional framework hardly (if at all) affects one of the employed variables. The national mean value of the variable *importance of the family* is a rather stable, not influenceable characteristic of a community. The other national variables considered in these analyses can be seen as part of the institutional environment and are, thus, adaptable by providing an appropriate framework for life satisfaction.

The indicator for the national quality of the education system is provided by the Global Competitiveness Index (GCI) of the World Economic Forum (http://www.weforum.org/). Based on the literature we further expect a significant impact by the national health system on SWB (Aslam and Corrado, 2012; Lin et al., 2013; Puntscher et al., 2015). Thus, we consider the influence of public and private expenditures for health, measured as percentage of the GDP, on life satisfaction. These variables on the national health expenditures are interpreted as proxies for the available quantity and quality of health services.

The labor market is considered with the corresponding unemployment rate of the countries, which has mostly been identified to have a negative impact on the indicators of SWB (Di Tella and MacCulloch, 2005; Wulfgramm, 2014). On the one hand, the unemployment rate is an indicator for the personal risk at the labor market. On the other hand, however, it could also influence the empathy of a person for fellow citizen with potentially risky jobs. In both cases, an influence of the unemployment rate on the individual life satisfaction is conceivable.

Two income indicators of a nation are further considered in the model: (1) The (natural logarithmic) gross domestic product per capita in PPP (in 2005 USD) (*ln(GDP p.c.)*) is used as measure of the economic development of each country (Bjørnskov et al., 2010; Easterlin, 1995). (2) The *Gini coefficient* of the income distribution considers the income inequality of a country (Alesina et al., 2004). These two national variables allow for considering if a wealthy or socially equal environment has an additional impact on life satisfaction of a person beyond her own financial situation.

The national level of the social capital components described above are further included as last subgroup of national attributes that may influence individual SWB. The analyses consider the national average of the trust question and the national average of active memberships as indicators for the civil society and the national mean confidence in the political system and the public administration as indicator for the

quality of public organizations. Consequently, considering both the individual and the national level simultaneously allows for separating the impact of the "objectively measured" quality of (these) institutions from the perceived quality via the single respondent.

Finally, a dummy variable is included that identifies Latin American countries. Previous research finds that these countries are rather special as they mostly report higher levels of SWB (Bjørnskov et al., 2010; Engelbrecht, 2009; Rode, 2013). Moreover, wave dummies are introduced to consider the fact that we use a pooled dataset.

All variables used in the subsequent estimations and their corresponding source and codification are briefly summarized in Table 1. The corresponding descriptive statistics of these variables are presented in Table B.1 in the Appendix B.

TABLE 1
Description of variables

	Description	Source
DEPENDENT VARIABLE		
Life Satisfaction	How satisfied are you with your life – 1 = not at all satisfied … 10 = very satisfied	EVS / WVS
INDIVIDUAL PERSONAL CHARACTERISTICS		
Age (squared)	Age of respondent in years (squared)	EVS / WVS
Gender	Gender of respondent - 1 = male, 0 = female	EVS / WVS
PERSONALITY TRAITS		
Life Control and self-esteem	How much freedom of choice and control over own life – 1 = No choice at all … 10 = A great deal of choice	EVS / WVS
Feeling of responsibility	1 = Government should take more responsibility … 10 = People should take more responsibility to provide for themselves	EVS / WVS
INDIVIDUAL OBSERVABLE ATTRIBUTES		
Marital status	Marital status of the respondent measured with dummy variables: 1 = married, 2 = living together, 3 = divorced, 4 = separated, 5 = widowed, 6 = single (reference)	EVS / WVS
Education level	Education level of respondent measured with dummy variables: 1 = „Incomplete elementary education", 2 = Completed elementary education, 3 = Complete secondary school: technical/vocational type, 4 = Complete secondary: university-preparatory type/Full secondary; 5 = University-level education with degree	EVS / WVS
Employment status	Employment status of respondent measured with dummy variables: 1 = „Full Time employment" (Reference), 2 = „Part-time employment", 3 = "Self employed", 4 = "Retired", 5 = "homemaker", 6 = "Students", 7 = "Unemployed" and 8 = "other"	EVS / WVS

Individual Income	Scale of Income: "'On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is. Please, specify the appropriate number, counting all wages, salaries, pensions and other incomes that come in."	EVS / WVS
General Trust	"Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?": 1 = Most people can be trusted, 0 = can't be too careful	EVS / WVS
Active membership	Sum of organizations, where respondent is active member resp. does unpaid voluntary work for.	EVS / WVS
Individual Importance of family	Dummy variable "How important is your family": 1 = very important, 0 otherwise	EVS / WVS
Confidence in political system (individual and national mean)	PCA component of "Confidence in the parliament", "Confidence in the government", "Confidence in political parties" - 1 = none at all … 4 = A great deal	EVS / WVS
Confidence in Public Administration (individual and national mean)	PCA component of "Confidence in justice system/courts", "Confidence in civil services", "Confidence in the police", "Confidence in the armed forces" - 1 = none at all … 4 = a great deal	EVS / WVS
NATIONAL ATTRIBUTES OF THE ENVIRONMENT OF A PERSON		
National Importance of family	National mean value of the importance of family	EVS / WVS
Quality of Education System	National Quality of Education System	GCI
Ln(GDP p.c.)	Gross Domestic Product per capita (constant 2005 US$), logarithmic	World Bank
Gini Coefficient	Gini Coefficient	SWIID
Unemployment rate	Unemployment rate (% of total labor force)	World Bank
National Trust level	National percentage of respondents reporting that "Most people can be trusted"	EVS / WVS
National active memberships	Mean sum of active memberships in a country	EVS / WVS

2.2. Methodology

In order to investigate the impact of the variables on life satisfaction we have to consider that respondents are grouped within countries and therefore correlated data arise. Mixed model analysis provides a general, flexible approach in this situation, because it allows a wide variety of correlation patterns (or variance-covariance structures) to be explicitly modelled (Snijders and Bosker, 2012). The term mixed model refers to the use of both fixed and random effects in the same analysis.

More specifically, a random variable for country and one for the year of survey are employed in order to model correlation structures and country year specific effects:

$$y_{ijt} = (\beta_0 + U_{0j} + U_{0t} + z'_{jt}\gamma) + x'_{ijt}\beta + \varepsilon_{ijt}, \tag{1}$$

where y_{ijt} is the value of the dependent variable (life satisfaction) for individual i ($i = 1,...,N$) in country j ($j = 1,...,n$) and survey year t ($t=1,...,T$), N is the number of respondents and n the number of countries, z'_{jt} is the vector of the values for the context variables (constant within a country and year), x'_{ijt} is the vector of values of each variable at the individual level, ε_{ijt} is the remainder noise with $\varepsilon_{ijt} \sim (0, \sigma^2)$ independently and identically distributed, U_{0j} is the random variable capturing country specific effects with $U_{0j} \sim N(0, \sigma^2_{country})$, U_{0t} is the random variable capturing time specific effects with $U_{0t} \sim N(0, \sigma^2_{time})$, γ, β_0, and β are the parameter vectors for the fixed effects, which are estimated via maximum likelihood.

For some of the independent variables their national mean is added in the regression, too. Therefore the variable at the individual level is implemented as deviation from its mean in order to obtain immediately the between and within estimates and their significance, i.e. $y_{ij} = \cdots + \beta_1(x^1_{ij} - \bar{x}^1_{.j}) + \beta_2\bar{x}^1_{.j} + \cdots$, where β_1 is the within effect and β_2 the between effect of variable x^1.

To investigate the explanatory power of the employed context variables, the random intercept is also modelled as a fixed parameter for each country and survey year (country year fixed effect model) and consequently, the context variables, i.e. z'_{jt}, are dropped. R-squared is computed for model comparison, which is defined as the squared correlation between the observed values of the dependent variable and the estimates. Due to the high number of observation units, a degree of freedom correction is not applied. Regarding the mixed model, the estimates are the sum of the fixed effects linear prediction plus the contributions based on predicted random effects (best linear unbiased predictions). Multicollinearity is checked for (Belsley et al., 2005).

3   Results

Table 2 presents the results of the multilevel model estimations for the full sample in column 1, the subsample of industrialized countries in column 2 and the subsample of developing countries in column 3. The country fixed effects model (not shown here) was also estimated to check the stability of the estimates regarding the random slope estimation. Whether further important country-specific impact variables besides the chosen national ones exist, is investigated by comparing R-squared of the country fixed effects model with the model considering the variables at both levels. For the latter model, just in this specific case, as measure for the explanatory power the fixed estimates only (and therefore not the estimates of the random intercept) are employed in order to gather the potential of the variables at the national level. The comparisons of the explanatory power indicates, however, that no evidence for important missing variables at the national level is found.

Overall, the calculated R-squared of the models of about 0.30 is rather high in comparison to corresponding publications analyzing individual SWB (cf. for example Ferrer-i-Carbonell (2005): R-

squared = 0.08; Hayo (2007): R-squared = 0.086; Helliwell and Putnam (2004): R-squared = 0.25; Jorgensen et al. (2010): R-squared = 0.29; Rodríguez-Pose and Berlepsch (2014): R-squared between 0.05 and 0.06; Rodríguez-Pose and Maslauskaite (2012): R-squared = 0.197; van den Berg et al. (2014): R-squared = 0.037).

For the interpretation of the results and the significance level of the coefficients, it is important to distinguish between the two levels. Highly significant results can be expected for the individual-level variables due to the high number of observations on the individual level (about 138,000, 69,000 and 68,000), even if the coefficient itself is hardly different from zero. On the other hand, the significance of the coefficient of the national variables (starting with the GDP p.c. in Table 2) is calculated based on the number of included countries, i.e. n = 81 for the full sample in model (1), n = 40 for the sample of rich countries model (2) and n = 41 for the sample of developing countries in model (3). Clearly, this issue is taken into account during the following interpretation of the results.

TABLE 2
Estimation of the Multilevel Models on the full sample (1), the sample of industrialized countries (2) and the sample of developing countries (3).

Dependent Variable: *Life Satisfaction*	(1) Full Sample	(2) Industrialized Countries	(3) Developing Countries
R-squared	31.00%	32.54%	28.78%
Constant	6.784***	2.979	5.420***
Individual-level Variables			
Age	-0.032***	-0.03***	-0.029***
Age^2	0.0004***	0.0003***	0.0003***
Gender (male = 1)	-0.103***	-0.0834***	-0.109***
View on Issue of Responsibility: Ref. Government should take more Responsibility			
Responsibility = 1 (People should take more responsibility)	0.274***	0.184***	0.327***
Responsibility = 2	0.152***	0.103***	0.181***
Responsibility = 3	0.132***	0.0792***	0.173***
Responsibility = 4	0.0269	-0.0205	0.0641*
Responsibility = 5	-0.0253	-0.0489*	-0.0204
Responsibility = 6	0.0177	0.00737	0.0123
Responsibility = 7	-0.0145	-0.0262	-0.0161
Responsibility = 8	-0.0242	-0.00381	-0.0641**
Responsibility = 9	0.0114	0.0110	0.00857
Life control and free choice: Ref. No choice at all			
Life control = 2	-0.257***	-0.124*	-0.292***
Life control = 3	0.00994	0.140**	-0.00365
Life control = 4	0.219***	0.386***	0.165***
Life control = 5	0.600***	0.794***	0.512***
Life control = 6	0.841***	1.048***	0.739***
Life control = 7	1.136***	1.358***	1.015***
Life control = 8	1.424***	1.634***	1.314***
Life control = 9	1.690***	1.938***	1.537***

Life control = 10 (great deal of choice)	1.917***	2.162***	1.783***
Marital Status: reference= Single			
Marital status = married	0.260***	0.319***	0.215***
Marital status = living together	0.124***	0.188***	0.0762**
Marital status = divorced	-0.158***	-0.120***	-0.236***
Marital status = separated	-0.256***	-0.231***	-0.296***
Marital status = widowed	-0.144***	-0.104***	-0.176***
Health: reference = very good			
Very poor health	-2.796***	-2.766***	-2.833***
Poor health	-1.928***	-1.937***	-1.899***
Fair health	-1.004***	-1.042***	-0.971***
Good health	-0.471***	-0.474***	-0.478***
Scale of income: reference = lower income scale			
Income scale = 2	0.182***	0.132***	0.190***
Income scale = 3	0.299***	0.232***	0.306***
Income scale = 4	0.486***	0.395***	0.506***
Income scale = 5	0.645***	0.519***	0.703***
Income scale = 6	0.799***	0.620***	0.909***
Income scale = 7	0.927***	0.679***	1.112***
Income scale = 8	1.018***	0.700***	1.263***
Income scale = 9	1.028***	0.752***	1.346***
Income scale = 10	1.011***	0.743***	1.279***
Education: reference = Incomplete elementary education			
Education 2 = Completed elementary education	0.00920	-0.0372	0.0145
Education 3 = Complete secondary school: vocational type	-0.0276	-0.0386	-0.0576
Education 4 = Complete secondary: university-preparatory type/Full secondary	-0.0567**	-0.0849**	-0.0690*
Education 5 = University with degree	-0.0214	-0.0797*	0.00466
Employment Status: reference = Full Time Employment			
Employment 2 = Part-time employment	-0.0282	-0.0139	-0.0634
Employment 3 = Self employed	-0.0483***	-0.0102	-0.0680***
Employment 4 = Retired	0.108***	0.152***	-0.00532
Employment 5 = Homemaker	0.153***	0.149***	0.141***
Employment 6 = Students	0.104***	0.176***	0.0436
Employment 7 = Unemployed	-0.259***	-0.407***	-0.215***
Employment 8 = Other	-0.0243	-0.0168	-0.0827
Interaction: Part-time employment x male	-0.0696*	-0.0249	-0.0789
Trust (1 = Most people can be trusted)	0.183***	0.230***	0.136***
Family very important	0.323***	0.382***	0.231***
Active memberships	0.0562***	0.0480***	0.0584***
Confidence in political system	0.0316***	0.00712	0.0570***
Confidence in public administration	0.134***	0.131***	0.132***
National Variables			
Ln(GDP p.c.)	0.147***	-0.0983	0.239***
Unemployment Rate	-0.000289	-0.0202*	0.000186
Public health expenditure (% GDP)	0.0271	0.0902***	0.0618
Private health expenditure (% GDP)	-0.0303	-0.0221	-0.0127

Quality of education system (GCI Indicator)	-0.0702	0.131*	-0.0247
Gini coefficient	-0.0134*	-0.0102	-0.0228**
National mean trust	0.474	0.440	0.992*
National mean of importance of family	-0.445***	0.882	-0.331*
National mean active membership	0.0457	-0.195	0.177
National confidence in political system	0.307*	0.0889	0.521**
National confidence in public administration	-0.0863	-0.227	-0.137
Dummy Latin America	0.940***	0.489**	1.449***
Dummy Wave 2008-2010 (EVS)	0.322***	0.107	0.792***
Dummy Wave 2010-2014 (WVS)	0.00477	-0.0815	0.114
Observations	138,362	69,498	68,864
Number of countries	81	40	41

Note: *** p<0.01, ** p<0.05, * p<0.1

Overall, the effects of the individual level variables on life satisfaction are found to be very similar for both developing and industrialized countries, except for the individual income categorization showing a slightly different course. The impact of the national variables are, however, quite different for developing and industrialized countries. The results shown in Table 2 are discussed in the following paragraphs by focusing on the findings for the subsamples of industrialized and developing countries.

The findings on the effect of the **personal characteristics** gender and age correspond to the current literature and are very similar across the three samples. Gender has a significant, but quantitatively negligible influence on life satisfaction: women are overall found to be more satisfied with life than men are by about 0.1 points. The impact of age on life satisfaction is generally U-shaped with higher values of life satisfaction for young and older people with a negative coefficient for the age variable and a positive coefficient for squared age. Age accounts for about a quarter point of life satisfaction. SWB is lowest at 50 years of age in industrialized countries and 48 years in developing countries followed in each case by a period of rising life satisfaction. Clearly, potential age-related physical afflictions are already captured with the considered health status.

The influence of this first group of explaining variables (gender and age) on SWB is quantified roughly with the difference of R^2 between the regressions with and without these variables. The R^2 decreases merely marginally without gender and age in the estimations on industrialized countries from 0.3254 to 0.3231 and in the estimations on developing countries from 0.2878 to 0.2864.

The second variable category includes **personality traits** of the respondent. These aspects clearly extend into the psychological sciences and are beyond the specialization of the authors. Our interest lies rather in understanding whether detectable effects of the personality on an individual's life satisfaction exist, which cannot (or only hardly) be influenced and, thus, are not subject to the political decision-making process. Additionally, if evidence is found for influential personality traits, the question is whether impacts obtained without them remain quantitatively the same or whether they diminish and could be classified as spurious. We consider for this study the perception of life control and the valuation of self-

responsibility. The suitability of the two representatives chosen for the personality traits can be discussed, but the result is clear: both indicators exert a significant impact on life satisfaction. Moreover, the estimated coefficients are also quantitatively similarly relevant for people in industrialized and developing countries. The question on the distribution of responsibility between an individual and the government indicates that more self-responsible people are more satisfied (0.2 resp. 0.3 points). The indicator of life control and free choice accounts further for up to 2.1 points in industrialized countries and 1.8 points in developing countries. Thus, people that feel to have a great deal of life control are more satisfied in both industrialized and developing countries. This finding is seen as an impetus for necessary interdisciplinary research. Overall, the R^2 increases by 0.077 by including this category on personality traits in the analyses of the industrialized countries and by 0.054 in the subsample of developing countries.

The third group of indicators considered in this study comprise various **individual-level properties of a person**. This category provides a change in explanatory power of about 0.113 and 0.071 in the sample of industrialized resp. developing countries. The distinction between the personality traits discussed above and this third category is not always unambiguous. For example, the subjective assessment of the health status or the general and institutional trust could certainly be affected by the personality structure of a person. Hence, this classification is rather motivated by the current literature on SWB, which considers these variables in most publications as influential driving forces. Clearly, these explaining variables might be differently affected by a designated welfare policy. We can expect that the indicators on income, education and employment are not only affected by one's own skills and decisions, but also by the institutional framework.

The marital status is found to have a significant impact on SWB, which is also quantitatively remarkable with a range of about a half point on the 10-point SWB scale. Briefly summarized, people living in a relationship (either married or living together) are better off than singles; all other types of marital status (i.e. separated, divorced, or widowed) deteriorate an individual's life satisfaction. Moreover, in both subsamples marriage has a particularly positive impact, whereas separation shows the strongest negative effect on life satisfaction. It is somewhat surprising that this effect of being separated is even (negatively) larger than the effect of a divorce. This might be possibly explained by the fact that the divorce is seen as a determined conclusion of a difficult stage of life and that a divorce dates back longer on average than a separation (Dolan et al., 2008).

As already known from the current literature, the subjective perception of one's own health has a strong impact on individual life satisfaction (Cuñado and de Gracia, 2012; Helliwell and Putnam, 2004; Pierewan and Tampubolon, 2014). As such, also in this study the subjective health status affects life satisfaction significantly by up to 2.8 score points. Thus, health exerts the strongest impact on life satisfaction amongst all considered variables in both considered samples of countries.

The individual-level income is measured by a self-assessment on a 10-point scale and included accordingly with nine dummy variables. The lowest scale is the reference category. This procedure allows to model the impact of income on life satisfaction in a highly flexible (non-linear) functional form. The coefficients of the income dummies indicate a significant influence of overall 0.75 score points for people in industrialized countries and 1.35 in developing countries. Thus, the income influence is found to be quantitatively higher in developing than in industrialized countries. It is moreover interesting that we find a saturation effect for income in both subsamples. This is also illustrated by Figure 2, which shows the coefficients of the income dummies in the three considered samples. For the subsample of industrialized countries, we find a significant positive impact of income for the categories 2 to 5. Subsequently however, the five top income categories (between 6 and 10) do not show statistically significant differences among each other. A similar effect is also found for developing countries. A significant improvement in life satisfaction is identified for the income categories 2 to 7. However, this effect vanishes for the top three income groups between category 8 and 10. These results suggest a saturation effect of income. Thus, income has no further direct effect on life satisfaction above a certain level. These coefficients further imply that a logarithmic transformation of income is not able to fully capture this saturation.
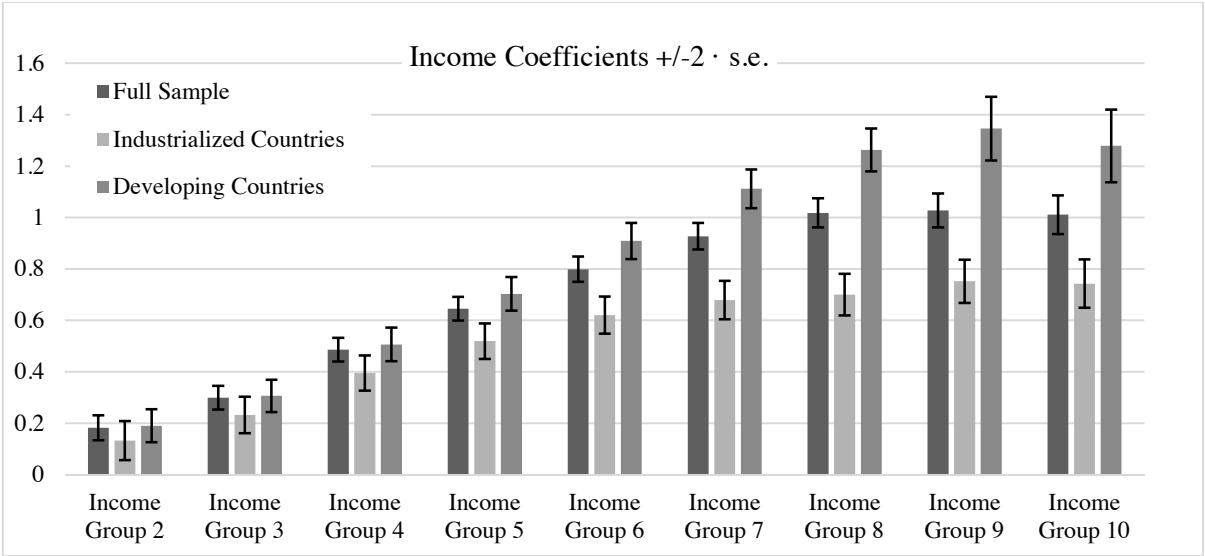
Note: s.e. denotes standard error

FIGURE 2
Income Coefficients

The dummy variables on a completed full secondary education and on a university degree show statistically significant but quantitatively negligible coefficients. Hence, the educational level seems to not affect a person's life satisfaction directly but rather indirectly through income or health, as also pointed out by Helliwell and Putnam (2004) or Dolan et al. (2008).

The employment status of a person exhibits an impact on SWB with an overall range of about 0.58 scale points for industrialized countries and of about 0.36 scale points in developing countries. Ceteris paribus,

homemaker are found to be the most satisfied people in developing countries. In the sample of industrialized countries homemaker, retired people and students show a significantly positive coefficient. Hardly surprising, the strongest and negative effect in both subsamples is provided for people, who are unemployed. We find no significant differences in the satisfaction of part-time and full-time employed people (reference category).

As last personal attributes of an individual, we consider some aspects of social capital: family ties, weak ties in terms of memberships and trust variables. All corresponding coefficients are positive and highly significant in both samples (except for the confidence in political system in industrialized countries). Their actual impact has to be considered of course with reference to the underlying scale of the variables: general trust and family importance for example are binary coded, the active membership question instead includes up to 11 organizations. In order to ensure a neat separation between the individual and the national level (as we also include national aggregates), we included the deviations of the individual-level values and the corresponding national mean. This approach allows to account for possibly different effects of these attributes on the individual and the national level (Puntscher et al., 2016). The strongest impact exhibits the variable on the importance of the family with a highly significant coefficient of 0.38 resp. 0.23.

Lastly, the influences of the **national variables** on the life satisfaction of a person are analyzed, which account in total for about 0.07 of the R-squared in the sample on industrialized countries and 0.03 of the R-squared in the sample on developing countries. Figure 3 provides an overview over the relative contribution of each included variable category to the achieved R-squared of the multilevel model estimations for the three samples. This investigation provides interesting insights as the national variables exhibit different influences on life satisfaction within the two subsamples discussed.
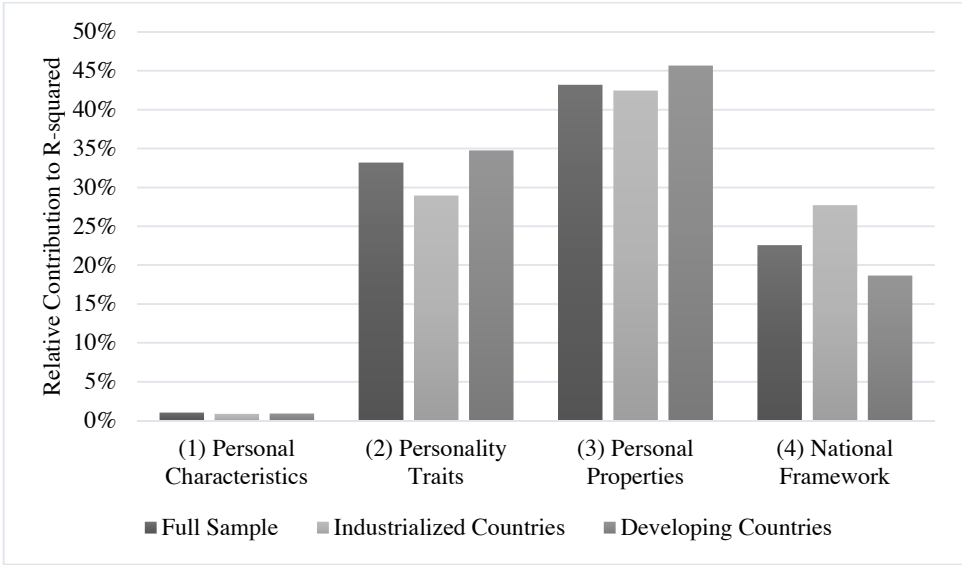

FIGURE 3
Relative contribution of the four considered variable categories to R-squared

Firstly, the national income measure, i.e. the GDP p.c., affects an individual's life satisfaction positively in the subsample of developing countries. This coefficient is, however, not significant for the industrialized countries. Thus, we potentially find a similar effect for the aggregated income indicator, i.e. the logarithmic per capita GDP, and the individual-level indicator, the income scale.

The macroeconomic indicator unemployment rate shows a significant negative influence on life satisfaction in the sample of industrialized countries. Thus, an individual is affected negatively by his or her personal unemployment and additionally by living in a community with a high unemployment rate. On the other hand, however, this impact is statistically not significant in the developing countries.

The national quality of the education system as a whole exerts a positive coefficient significant on the 10% level, again however only for the sample of industrialized countries. Thus, similar to the findings on the individual level of education, the national education variable does not convincingly support a significant direct impact on SWB.

The investigation of the effect of the national health system provides, however, interesting results. The health system is considered in terms of public and private health expenditures in % of GDP. The corresponding findings in Table 2 indicate a significantly positive influence of the public expenditures on a person's life satisfaction at least for the sample of industrialized countries, whereas the private health expenditures do not exhibit any statistically significant coefficient. This is remarkable, as these two types of expenditures could also be classified as substitutes with a similar impact on SWB. However, this line of argumentation seems not to correspond to the perception of the population. It rather becomes evident that the different framing (public or private) of closely related services are not necessarily equivalent with respect to life satisfaction. Possibly, the public health expenditures generate an additional solidarity in terms of risk sharing among the population of industrialized countries and is, thus, more efficient at equal costs.

The last set of explaining variables discussed comprises the average social capital components on the national level. Thus, as the same variables on social capital are considered on both levels, namely the national mean on the aggregated level and the deviation from the national mean on the individual level, it is possible to compare the findings directly. Surprisingly, the aggregated social capital indicators show a significant influence only for the sample of developing countries.

Two indicators of social capital show the same influence on these two observation levels. The level of trust has a positive effect on life satisfaction on the individual level and the national level (at the 10% significance level). Thus, to be a trusting person and to live in a trusting country is important for one's own life satisfaction. Further, the confidence in the political system significantly improves the life satisfaction of a person on both levels. Hence, it is not only important how the single person perceives the political system but also how the community as a whole values its quality.

On the other hand, two social capital indicators exert a significant impact on the individual level, but become statistically non-significant if considered on the national level in the sample of developing

countries. This applies to the mean active memberships and the mean confidence in public administration.

The discrepancy between the two observation levels becomes particularly clear with respect to the family ties in the overall and the developing sample: both included indicators on the importance of the family are significant for developing countries, but show opposite signs. Thus, living in a society with a strong focus on the family is not desirable for its inhabitants, although on an individual level a sound personal family situation enhances life satisfaction.

The noticeable difference in the influences of the individual and the national level highlights clearly the necessity to consider the different levels of a society simultaneously in the analyses on SWB. Thus, the findings of this multilevel model actually substantiate the earlier statement (Puntscher et al., 2016), that a multilevel relationship should never be analyzed solely on a single level.

4   Discussion and Conclusion

Whenever analyses relate to various countries, the findings substantiate the necessity to consider individual as well as national variables, i.e. the social, cultural or economic context of a person, in order to appropriately estimate the impact of the variables – in our case - on life satisfaction. A couple of methodical and empirical results substantiate this conclusion. The increase in R-squared by 6 percentage points (almost a quarter of the total R-squared) achieved due to the consideration of the macro variables supports the valuable contribution of the second level in the model. The comparison of the random intercept model with the country fixed effects model demonstrates that the macro level is modelled appropriately with the employed variables. Clearly, neglecting the national level weakens the explanatory power of the model. However, much more severe is the consequence of biased estimates when ignoring the macro variables, a problem which is also apparent in the results. Such erroneous estimates lead to problematic interpretations as an impact of a variable on the individual level can be qualitatively quite different from the impact of this variable on the aggregated level. In our analysis this is evident concerning the importance of family: on the individual level the variable *family very important* has a positive impact on life satisfaction, but on the national level a society's assessment of the importance of the family is negatively related to the individual life satisfaction for developing countries.

In order to guard against misunderstandings, the 6 percentage point increase in R-squared should not be understood as the total influence of social policy on life satisfaction. Clearly, economic policy has an impact on the individual situation of a person, e.g. her education, income or employment status. In this respect, the macro variables represent effects beyond the individual level like the quality of the education system or the political system.

An advantage of a multilevel approach is the possibility of modelling potential sample heterogeneity via introducing the second level, in our case by modelling the macro level. However, the problem of heterogeneity is not solved, but it becomes smaller. Actually, the split of the sample in industrialized

and developing countries demonstrates that statistically significant and substantial differences in the effects of variables on life satisfaction exist. There are variables, which are statistically significant in the full sample but only in one of the two subsamples (*ln(GDP p.c.), Gini coefficient, national mean of importance of family*, *confidence in political system*). Other variables are not statistically significant in the full sample but significant for one of the subsamples (*unemployment rate*, *public health expenditure* or quality *of education system*). This is not just an underlying methodical problem as the differences cause important varying politico-economic interpretations.

On the individual level, the results between the two groups of countries agree with respect to sign and statistical significance. Just regarding the employment status (with the reference of full time employment) being retired or a student increases life satisfaction in industrialized countries ceteris paribus, which is not the case for developing countries. This may be due to the better system of social transfers in the industrialized countries. *Confidence in political system* has only a positive impact in the developing countries. This is consistent with the thesis that system conformity and especially system non-conformity has larger consequences in developing countries than in industrialized ones. Whether this is actually the reason, however, cannot be answered yet with the employed data.

Comparing the subsamples, more important are differences in the size of the regression coefficients, whenever their impact is statistically significant and has the same sign. Such differences are particularly noticeable regarding the importance of having control over her/his own life (higher in industrialized countries), the role of the state (the willingness to take personal responsibility has in developing countries a larger impact on life satisfaction) and income (discussed below). Obvious are differences between the two groups of countries on the macro level. Concerning the industrialized countries, the proportion of health expenditures and the quality of the education system have statistically significant positive impact on life satisfaction. For both variables, no significant impact is found for the developing countries (or for the full sample). Whether these issues have a higher value in developed economies or which kind of mechanism underlies these results has to be clarified with the help of further analyses.

Interesting is the fact that *national mean trust* and *national confidence in political system* are just significant in developing countries. As these are not individual but aggregated national values, these variables can be interpreted as indicators for a basic social consensus, which is less self-evident for developing countries than for industrialized countries. Compatible with this interpretation is also the negative sign of the *national mean of importance of family* that is only significant for developing countries although at individual level the impact is positive. Reasonable is that this aggregated variable denotes an indicator for bonds with tradition and is therefore on average negatively perceived.

The most important differences both on an individual as well as on a national level show the variables concerning income and income distribution (*income, ln(GDP p.c.), Gini coefficient*). On the individual

level, both country groups have a saturation level of *income* above which an additional increase has no further effect on life satisfaction. This saturation point is at income level six for industrialized countries and at level eight for developing countries. This implies that 40 percent of the population in industrialized countries is already in the saturation stage and one-tenth in developing countries. On the aggregated level, a significant impact of GDP per capita is found for the developing countries but not for the industrialized ones and the Gini coefficient has a statistically significant negative impact just for developing countries. Quite diverse findings are achieved due to the simultaneous consideration (1) of the individual and macro level and (2) of the heterogeneity between developing and industrialized countries. How can these findings help to find explanations regarding the ambivalent results in the literature concerning the Easterlin Paradox? Clearly, the results are sensitive regarding the choice of countries. GDP p.c. is statistically significant for the developing countries but not for the industrialized countries. As both groups of countries are per definition different in their GDP level this implies a positive impact on life satisfaction in the lower income part and no impact in the upper part. The significant impact for the full sample is consequently due to misspecification. The log-linear relationship of GDP p.c. on life satisfaction is so strong for developing countries that the relationship becomes statistically significant even for the full sample. However, the estimation of two separate log-linear relationships reveals no impact for the industrialized countries.

A stronger source for ambivalent results of economic growth on life satisfaction offers the individual level: as the impact of economic growth might be very different for the income scales, the final increase of life satisfaction depends strongly on the income scale, which is actually affected by an overall increase in income. If income increases across all scales uniformly, an overall increase of life satisfaction in the population is obtained. However, if the income increase just happens for the people in the saturated income scales (which comprise about 40% of the population for industrialized countries), no impact on life satisfaction is achieved. If economic growth is obtained at the expense of a more unequal income distribution, even negative effects of such an income increase is possible. Therefore, knowing which income scale benefits from an income increase is crucial for drawing a decisive conclusion about the change in life satisfaction. As income scales may vary over time, contradicting conclusions regarding the impact of income on life satisfaction are conceivable. One would expect that the *Gini coefficient* is able to capture this effect. However, the Gini coefficient is too inertial and ambivalent (different distributions can have the same Gini coefficient) to be able to achieve this goal. A decomposition of the income increase into the corresponding income deciles is necessary in order to test above hypothesis.

The different height of the saturated income level between the two groups of countries demonstrates that the problem of a saturation level is much smaller in the developing countries than in the industrialized countries. In developing countries, just one-tenth of the population is affected and the overall income level is statistically significant. From this finding, a plan of actions or a few recommendations regarding economic growth policy, development policy and distribution policy would

follow. Unfortunately, the study has two shortcomings and therefore the findings cannot be interpreted as tested hypothesis. The findings rather generate hypotheses, whose testing has to be left for future research. What are these shortcomings? First, the dataset used does not provide the 'true' individual-level income of the interviewees. Instead, a personal evaluation of one's own household income situation, counting wages, salaries, pensions and other incomes, is provided. Second, the dataset allows only cross-section analyses. Hence, the impact of an income change on the change of SWB has not yet been assessable. For a more profound investigation, a panel data set or a difference in differences modelling approach is necessary. However, this study indicates that multilevel modelling approaches are necessary to obtain robust results and that the impact of macroeconomic variables diverges in dependence of the country's development status. Thus, future research in this area is shown to be necessary and promising.

APPENDIX A

Results of the Principal Component Analyses

1   PCA – Confidence in Political System

TABLE A.1:
Component Matrix - Confidence in Political System

	Component
Confidence in the Parliament	0.885
Confidence in Political Parties	0.862
Confidence in Government	0.862

Extraction Method: Principal Component Analysis.

2   PCA – Confidence in Public Administration

Table A.2:
Component Matrix - Confidence in Public Administration

	Component
Confidence in the Police	0.824
Confidence in Justice System/Courts	0.817
Confidence in the Civil Services	0.740
Confidence in Armed Forces	0.685

Extraction Method: Principal Component Analysis.

APPENDIX B.

TABLE B.1: *Descriptive Statistics*

Variable	Full Sample				Industrialized Countries				Developing Countries			
	Mean	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**
Life Satisfaction	6.97	2.21	1.00	10.00	7.22	2.00	1.00	10.00	6.72	2.39	1.00	10.00
Age	43.15	16.85	15.00	108.00	47.28	17.16	15.00	108.00	38.98	15.44	15.00	95.00
Age squared	2145.8	1602.2	225.0	11664.0	2530.22	1704.58	225.00	11664.00	1757.9	1387.8	225.0	9025.0
Gender (1 = male, 0 = female)	0.48		0.00	1.00	0.48		0.00	1.00	0.50		0.00	1.00
Life Control	7.06	2.23	1.00	10.00	7.04	2.09	1.00	10.00	7.08	2.35	1.00	10.00
Responsibility	5.85	2.91	1.00	10.00	5.59	2.74	1.00	10.00	6.12	3.04	1.00	10.00
Marital Status			1.00	6.00			1.00	6.00			1.00	6.00
Subjective Health Status	3.85	0.87	1.00	5.00	3.85	0.87	1.00	5.00	3.85	0.87	1.00	5.00
Scale of Income	4.82	2.32	1.00	10.00	5.26	2.29	1.00	10.00	4.38	2.27	1.00	10.00
Education level	4.94	2.12	1.00	8.00	5.09	2.06	1.00	8.00	4.79	2.17	1.00	8.00
Employment Status			1.00	8.00			1.00	8.00			1.00	8.00
Trust	0.00	0.41	-0.76	0.97	0.01	0.45	-0.76	0.96	0.00	0.38	-0.59	0.97
Family very important	0.88	0.32	0.00	1.00	0.88	0.33	0.00	1.00	0.89	0.32	0.00	1.00
Active Memberships	0.03	1.09	-1.80	10.76	0.03	0.99	-1.59	10.72	0.03	1.19	-1.80	10.76
Confidence in Political System	0.00	0.88	-2.90	3.21	0.02	0.83	-2.46	2.96	-0.01	0.93	-2.90	3.21
Confidence in Public Administration	0.00	0.89	-3.23	3.15	0.01	0.81	-2.91	2.66	-0.01	0.96	-3.23	3.15
Ln(GDP p.c.)	8.98	1.39	5.33	11.35	10.12	0.67	8.73	11.35	7.84	0.89	5.33	9.02
Unemployment Rate	7.23	4.80	0.60	33.80	5.77	2.06	2.60	11.50	8.71	6.13	0.60	33.80
Public Health Expenditure (% GDP)	4.53	2.20	0.82	8.67	5.98	1.93	1.20	8.67	3.07	1.32	0.82	6.42
Private Health Expenditure (% GDP)	2.79	1.49	0.85	8.71	2.67	1.49	0.85	8.71	2.90	1.48	0.95	7.21
Quality of Education System	3.95	0.89	1.90	5.99	4.42	0.83	2.76	5.99	3.47	0.67	1.90	5.26
Gini coefficient	36.12	8.22	23.77	59.39	31.50	5.89	23.77	48.61	40.78	7.58	28.54	59.39
National Trust	0.28	0.17	0.03	0.76	0.36	0.17	0.04	0.76	0.20	0.13	0.03	0.59
National Mean of "Importance of Family"	3.83	0.34	1.28	3.99	3.86	0.07	3.58	3.96	3.81	0.48	1.28	3.99
Mean Active Membership	0.63	0.45	0.07	1.80	0.58	0.35	0.14	1.59	0.68	0.53	0.07	1.80
National Confidence in Political System	0.00	0.44	-0.90	1.95	-0.08	0.30	-0.64	0.90	0.08	0.54	-0.90	1.95
National Confidence in Public Administration	-0.01	0.40	-1.08	1.44	0.02	0.29	-0.60	0.60	-0.03	0.48	-1.08	1.44

Note: Std.Dev. denotes the standard deviation of the corresponding variable

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Do methodical traps lead to wrong development strategies for welfare? A multilevel approach considering heterogeneity across industrialized and developing countries

Abstract
Subjective well-being (SWB) is becoming increasingly important as welfare concept in both scientific research and politics, as it comprises additional welfare aspects compared to the GDP per capita. Consequently, it becomes important to explicitly identify its driving forces and clarify still ambivalent findings of the literature. For this purpose, with a multilevel model we investigate the extent to which individual-level and national variables together influence subjective well-being. Moreover, we expect that life satisfaction of people in developing countries is determined differently than life satisfaction of people in industrialized countries. The database used includes both individual and national variables and is split into two subsamples of 40 industrialized countries and 41 developing countries. The results show that the national environment is highly important for a person's SWB. Thus, neglecting this national level would generate biased estimates. Moreover, the split into industrialized and developing countries shows that statistically significant and substantial differences in the effects on life satisfaction exist. Important differences are found for example regarding the income variables. We identify a saturation effect of income on the individual level, whose level is however different depending on the development status of the countries. Moreover, on the aggregated level a significant impact of GDP per capita is found for the developing but not for the industrialized countries. Thus, this study indicates that multilevel modelling approaches are necessary to obtain robust results and that the impact of macroeconomic variables diverges in dependence of the country's development status.