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**MACROECONOMIC PERFORMANCE
AND INSTITUTIONAL CHANGE:
EVIDENCE FROM SUBJECTIVE WELL-BEING DATA**

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The relationship between macroeconomic performance and institutional change is explored in member countries of the Organization for Economic Cooperation and Development (OECD). We first assess the effects of national income growth, unemployment and inflation on subjective well-being (SWB) in thirty OECD countries, and employ the relationships found to construct an index of macroeconomic performance in terms of SWB. Applying the index to the period 1990-2009, we find that macroeconomic performance has improved in OECD overall and in the majority of countries, and that there has been a convergence of performance within the OECD. We then present evidence that OECD countries' performance, as measured, is positively related to institutional change towards more trade openness and better institutional quality. We argue that both increased openness and improved institutional quality are correlates of economic and political integration and conclude that international integration has enhanced SWB by improving OECD countries' national macroeconomic performance.

JEL classification codes: F15, E61, I31

Key words: macroeconomic performance, institutional change, international integration, subjective well-being, OECD

1. Introduction

The past few decades have seen a wave of international economic integration and institutional reform, including the transition of Eastern European countries from socialism to capitalism and their accession to the European Union, the introduction

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of the euro as a common currency, the creation of the North American Free Trade Agreement, and the removal of trade barriers worldwide.

With respect to such developments, economists have emphasized the positive economic effects of trade openness (Sachs and Warner 1995, Frankel and Romer 1999) and improved institutional quality (Acemoglu et al. 2001, Rodrik et al. 2004), whereas social scientists and the general public have often been critical towards economic liberalization and “globalization”. Especially, there has been concern about negative impacts on output and employment in developed countries due to competition from developing and emerging economies (see, e.g., Bauman 1998).

Against this background, this paper explores the relationship between macroeconomic performance and institutional change in member countries of the Organization for Economic Cooperation and Development (OECD) over the past two decades. As is well-established in the macroeconomics literature, we capture macroeconomic performance by the standard goals of GDP growth, low unemployment and price stability.¹ Institutional change is captured by indicators of trade openness, civil liberties, and the control of corruption.²

While the set of factors that constitute macroeconomic performance seems uncontroversial as such, it is not clear how these factors are to be integrated into an *overall* measure of macroeconomic performance, and it is this issue to which this paper also contributes. We do so by using a measure of subjective well-being (SWB) as an empirical indicator of welfare. Specifically, we run SWB regressions to study how the rates of growth, unemployment, and inflation prevailing in a set of thirty OECD countries affect citizens’ well-being and use the results to construct a composite index of national macroeconomic performance.³ This approach follows a recent trend of using subjective measures of well-being in economics analysis.

¹ These indicators reflect the common view of macroeconomic performance, as stated in one leading textbook: “a successful economy is an economy that combines high output growth, low unemployment and low inflation” (Blanchard et al. 2010: 27).

² These institutional indicators are not *direct* measures of economic institutions (like absence of trade barriers) or political institutions (like democracy). The measure of trade openness (imports plus exports as a fraction of GDP) is a *consequence* of the removal of trade barriers, and civil liberties and the control of corruption are measures of the *quality* of democracy and governance. All countries in our sample (OECD countries) are electoral democracies, but differ with respect to the quality of democracy, as captured by civil liberties.

³ Unemployment is typically a factor that contributes to higher inequality, especially at business cycle frequencies. Therefore, our macro index leads to take into account distributive considerations that do not appear in an average measure like income growth.

Using information on people's SWB has been advocated by a group of renowned economists as a means for assessing social and economic performance of countries (Stiglitz et al. 2009, Oswald 2010).⁴

Having established an SWB-based performance index, we explore the hypothesis that institutional change in OECD countries over the past two decades (better democratic institutions, less corruption, more trade openness) has enhanced national macroeconomic performance, as measured. This hypothesis is based on the idea that the relationship between SWB and the macro variables indicates that people have a preference for growth, low unemployment, and price stability. Since better democratic institutions (proxied by civil liberties) and a lack of corruption foster a policy close to people's preferences, we expect that civil liberties and the control of corruption lead to better economic performance as perceived by the citizens. In addition, consistent with standard economic reasoning, we expect openness to trade and international competition to spur growth and employment and to impose discipline on price increases. Overall, assuming an effect of institutional quality on macroeconomic performance and an effect of macroeconomic performance on SWB, we study the impact of institutional quality on welfare as it affects macroeconomic performance and expect this effect to be positive.⁵

In our study we use data for 91,195 individuals from the World Values Surveys, 1990-2008, to investigate the relationship between people's SWB on the one hand and the macroeconomic target variables unemployment, inflation, and national income change on the other in thirty OECD countries.⁶ Controlling for

⁴ Using subjective measures of well-being has gained increasing attention in economics over the past two decades (Frey and Stutzer 2002, Di Tella and MacCulloch 2006, Kahneman and Krueger 2006). One strand of this literature has studied how SWB is related to macroeconomic conditions, focusing on long-term developments in per capita income (Easterlin 1974, Stevenson and Wolfers 2008, Deaton 2008, Easterlin et al. 2010) on the one hand, and on rates of unemployment and inflation (Di Tella et al. 2001, Wolfers 2003) along with short-term changes in national income (Di Tella et al. 2003, Welsch 2007) on the other. While there is evidence that – due to habituation – SWB hardly rises with long-term increases of a country's income (Easterlin 1974, Easterlin et al. 2010), SWB is positively related to year-to-year increases in national income (Di Tella et al. 2003, Welsch 2007, Easterlin et al. 2010), in addition to being negatively related to levels of unemployment and inflation (Di Tella et al. 2001, 2003, Wolfers 2003, Blanchflower et al. 2014).

⁵ A considerable body of work investigates the (direct) role of institutions for SWB (see Helliwell and Huang 2008 and Bjørnskov et al. 2010 for a comprehensive assessment), but their indirect effect through economic performance does not seem to have been investigated.

⁶ The analysis is restricted to developed countries (OECD countries) because the rate of unemployment is not a sufficiently well-defined variable in less developed countries due to the existence of large informal sectors in these economies (Blanchard et al. 2010).

personal socio-demographic characteristics (including the relative income position and the individual employment status) as well as region and time dummies, we find that self-reported life satisfaction in the OECD countries displays a statistically significant negative relationship to the unemployment rate and the inflation rate, and a significant positive relationship to the annual rate of GDP growth. These results are robust to using several estimation methods and to controlling for the level of GDP.

We use the estimated relationships to construct an index of regression-weighted macroeconomic performance in terms of SWB. Applying the index to the period 1990-2009, we find that performance has improved in OECD overall and in the majority of countries, and that there has been a convergence of macroeconomic performance within OECD. We then present evidence that OECD countries' performance, measured this way, is positively related to the prevailing degree of trade openness and the quality of governance (civil liberties and lack of corruption). We argue that both increased openness and improved institutional quality are correlates of economic and political integration and conclude that international integration has enhanced SWB by improving OECD countries' macroeconomic performance.

Exploration of the relationship between macroeconomic indicators and subjective well-being was pioneered by Di Tella et al. (2001). In a regression analysis for twelve member countries of the European Union (EU12), 1975-1991, they found a statistically significant inverse relationship between life satisfaction and the unemployment and inflation rates prevailing in those countries. Di Tella et al. (2003) experimented with including per capita GDP or changes thereof in several versions of a life satisfaction equation for EU12, over the period 1975-1992. When they added the change in per capita GDP to an equation over unemployment and inflation, they found at least one of those three variables to be insignificant. A similar analysis, also for EU12, was conducted by Welsch (2011) for the period 1992-2002. He found life satisfaction to be negatively associated with the rates of unemployment and inflation but positively associated with the annual GDP growth rate, thus establishing a macroeconomic social welfare function over growth, employment and price stability.⁷

⁷ The analysis of those papers as well as the analysis of the present paper focuses on short-term macroeconomic performance. This is to be distinguished from papers that address the relationship between subjective well-being and long-term income growth. See the detailed discussion in subsection III.B.

Overall, this paper makes three main contributions. First, it establishes a robust relationship between life satisfaction on the one hand and the rates of (short-term) GDP growth, unemployment and inflation on the other not just for EU12 but for the almost entire set of OECD countries, and it does this for a more extended time period than previous papers. Second, it employs the estimated relationships to construct a composite macroeconomic performance index and uses it for an assessment of the overall macroeconomic performance of OECD countries over the past two decades. Third, it investigates how overall macroeconomic performance, as measured, is related to international integration and changes in the institutional environment.

The paper proceeds as follows. Section II presents the empirical background, the methodological framework, and the data. Section III presents and discusses the empirical results on aggregate economic performance and section IV investigates the relationship between economic performance and institutional change. Section V concludes.

II. Empirical framework

A. Macroeconomic performance of OECD countries, 1990-2009

As a background to the subsequent analysis, Table 1 presents rankings of thirty OECD countries in terms of GDP growth, (low) unemployment and (low) inflation over the period 1990-2009. As seen, the three criteria imply considerably diverging orderings. In terms of the range, the discrepancy is particularly large in the case of Japan, which shows the best performance with respect to inflation but ranks only 29th with respect to growth. A similar discrepancy between a high degree of price stability and poor growth can be found in the case of Switzerland which, interestingly, performs extremely well with respect to both inflation *and* unemployment. On the other hand, the fast growing Slovak Republic performs relatively bad with respect to inflation, but even more so with respect to unemployment. To a lesser extent, the discrepancy between strong growth and poor price stability applies to Korea and Ireland, but these two countries differ in that Korea performs much better in terms of unemployment than does Ireland.

Table 1. Ranking of OECD countries, 1990-2009

| Country | GDP growth | Unemployment | Inflation | Range |
|-----------------|------------|--------------|-----------|-------|
| Australia | 7 | 17 | 16 | 10 |
| Austria | 18 | 8 | 10 | 10 |
| Belgium | 23 | 19 | 7 | 16 |
| Canada | 17 | 20 | 8 | 12 |
| Czech Republic | 24 | 11 | 24 | 13 |
| Denmark | 25 | 14 | 5 | 20 |
| Finland | 19 | 27 | 4 | 23 |
| France | 27 | 21 | 3 | 24 |
| Germany | 26 | 22 | 6 | 20 |
| Greece | 12 | 26 | 25 | 14 |
| Hungary | 16 | 18 | 28 | 12 |
| Iceland | 8 | 2 | 23 | 21 |
| Ireland | 1 | 23 | 18 | 22 |
| Italy | 30 | 25 | 19 | 11 |
| Japan | 29 | 6 | 1 | 28 |
| Korea | 2 | 3 | 21 | 19 |
| Luxembourg | 4 | 7 | 12 | 8 |
| Mexico | 9 | 4 | 27 | 23 |
| Netherlands | 14 | 5 | 11 | 9 |
| New Zealand | 15 | 15 | 13 | 2 |
| Norway | 11 | 9 | 9 | 2 |
| Poland | 6 | 28 | 29 | 23 |
| Portugal | 22 | 13 | 22 | 9 |
| Slovak Republic | 3 | 29 | 26 | 26 |
| Spain | 10 | 30 | 20 | 20 |
| Sweden | 21 | 12 | 14 | 9 |
| Switzerland | 28 | 1 | 2 | 27 |
| Turkey | 5 | 24 | 30 | 25 |
| United Kingdom | 20 | 16 | 15 | 5 |
| United States | 13 | 10 | 17 | 7 |

Note: The rankings are based on average rates of annual GDP growth, unemployment, and inflation. OECD countries Chile and Slovenia are excluded because the data necessary for the econometric analysis to be conducted below are incomplete. Source of original data: *OECD Economic Outlook*.

In contrast to these countries, there are a few others which show a rather balanced performance in terms of all three criteria, in particular New Zealand, Norway, and the United Kingdom. These countries perform reasonably well in terms of all indicators, taking positions between 9 (unemployment in Norway) and 20 (growth in the United Kingdom). There is no country that performs very good or very bad with respect to all three criteria. However, Luxembourg is in the top-ten group with respect to growth and unemployment and in the intermediate group with respect to price stability. On the other hand, Italy is in the bottom-ten group in terms of growth and unemployment and just barely in the intermediate group in terms of price stability.

In a more aggregate perspective, the rankings based on the three criteria are either negatively related or unrelated to each other. Specifically, the rankings based on growth and inflation are negatively and significantly (at the 1-percent

level) correlated ($r = -0.586$). The rankings based on growth and unemployment are virtually uncorrelated ($r = -0.051$) whereas the rankings based on inflation and unemployment are insignificantly correlated (at $r = 0.210$).⁸

It may be noted that this assessment refers to the average performance across two decades. The assessment could, of course, be differentiated according to sub-periods. We abstain from such a differentiation at this place.⁹ The important point is that even in a fairly long-term perspective the macroeconomic performance scores are far from uniform in terms of the various policy goals. Therefore, the question arises as to how these goals are to be weighted and how successful the countries were in terms of their overall economic performance.¹⁰

The remainder of the paper deals with these issues, using the relative contribution of the macroeconomic variables to citizens' life satisfaction as the basis for weighting them.

B. Data

Our life satisfaction regressions are based on data from the World Values Surveys (WVS), referring to 91,195 individuals in thirty OECD countries in the years 1990, 1995-2001 and 2005-2008.¹¹ The WVS were conducted in four so-called waves around 1990, 1995, 2000, and 2005 (see <http://www.worldvaluessurvey.org>).¹² The data used in this study refer to 1990 (first wave), 1995-1998 (second wave), 1999-2001 (third wave) and 2005-2008 (fourth wave). Since the persons surveyed

⁸ For the variables themselves (rather than the implied rankings), the correlations are as follows: growth-inflation: -0.180 ($p < 0.019$), growth-unemployment: -0.019 (n.s.), inflation-unemployment: 0.005 (n.s.).

⁹ A more differentiated discussion will be given in section III.

¹⁰ An indicator of macroeconomic conditions sometimes reported in the regular press is the sum of the annual inflation rate and the unemployment rate, which was proposed by Arthur Okun and is often referred to as the "economic misery index". Lovell and Tien (2000) found that this index is a good predictor of the index of consumer sentiment.

¹¹ The countries in our sample are Canada, Mexico, USA (region OECD-America); Japan, Korea (region OECD-Asia); Australia, New Zealand (region OECD-Pacific); Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Switzerland, UK (region OECD-Western Europe); Czech Republic, Hungary, Poland, Slovak Republic, Turkey (region OECD Eastern Europe); Denmark, Finland, Iceland, Norway, Sweden (region OECD-Scandinavia). OECD countries Chile and Slovenia are excluded because data are incomplete.

¹² The WVS methodology consists of the administration of detailed questionnaires in face-to-face interviews. The questionnaires from the most recent waves have consisted of about 250 questions. In each country the questionnaires are administered to between about 1,000 and 3,500 persons with an average in the fourth wave of about 1,330 interviews per country.

differ from year to year, our database is a pooled cross-section time series. Overall, we have 77 country-year clusters, the number of years per country ranging from 1 to 4 and averaging about 2.5.

Data on life satisfaction (*LS*), which is our measure of SWB, are elicited as the response to the following question: “All things considered, how satisfied are you with your life as a whole these days?” *LS* is measured on a 10-point scale, where 1 is “dissatisfied” and 10 is “satisfied”. In addition to *LS*, measured this way, we take from the WVS data on people’s socio-demographic characteristics, especially the employment status and self-assessed income.¹³

Data on macroeconomic variables (annual percentage rates of unemployment, inflation, and GDP growth; levels of GDP per capita, exports, and imports) are taken from the OECD online database (<http://www.oecd.org>).

Data on institutional quality come from several sources. The variable “civil liberties” is taken from Freedom House (<http://www.freedomhouse.org>). Civil liberties are rated by a team of regional experts and scholars on the basis of a checklist of 15 civil liberty questions grouped into four subcategories: freedom of expression and belief, associational and organizational rights, rule of law, personal autonomy and individual rights. The aggregate civil liberties ratings are coded as integers ranging from 1 (most free) to 7 (least free). We inverted the original data such that 1 indicates “least free” and 7 indicates “most free”.

The variable “control of corruption” is the Corruptions Perceptions Index (CPI) provided by Transparency International (<http://www.transparency.org>). The CPI is an aggregate indicator that brings together data from various sources by independent institutions. All sources measure the overall extent of corruption (frequency and/or size of bribes in the public and political sectors). Evaluation of the extent of corruption is done by country experts, both residents and non-residents, and business leaders. The annual CPI is available from 1995 onwards; all CPI reports refer two years back. The scale of the data ranges from 1 (highly corrupt) to 10 (highly clean).

In robustness checks we used the variables “voice and accountability” and “control of corruption” from the World Bank’s Worldwide Governance Indicators

¹³ Self-assessed income is measured on a scale from 1 = “low income” to 10 = “high income”. It should be interpreted as relating to relative income and will thus not track changes of per capita income over time. We therefore experiment with including per capita income as an additional control variable.

(<http://info.worldbank.org/governance/wgi/index.asp>). The data are in units of a standard normal distribution, with mean zero, standard deviation of one, and running from approximately -2.5 to 2.5, with higher values corresponding to better governance. The data are available from 1996 onwards.

Descriptions of the variables and summary statistics of all data used are presented in Tables A1 and A2, respectively (see online appendix).

C. Econometric approach

Our life satisfaction equation is stated as follows:

$$LS_{ict} = \alpha \cdot unemployment_{ct} + \beta \cdot inflation_{ct} + \gamma \cdot growth_{ct} + \delta \cdot controls_{ict} + \varepsilon_{ict}, \quad (1)$$

where LS_{ict} denotes life satisfaction of individual i in country c and year t , $controls_{ict}$ is a vector of the individual's socio-demographic characteristics (age, age-squared, sex, marital status, employment status, relative household income, number of children) that are usually included in SWB regressions (Frey and Stutzer 2002, Di Tella and MacCulloch 2006), and ε_{ict} is an error term. Also included are dummy variables for the respective waves of the WVS and for the OECD regions (America, Asia, Pacific, Eastern Europe, Western Europe, and Scandinavia).¹⁴

We note that equation (1) intentionally focuses on the key variables of macroeconomics, unemployment, inflation, and growth, which have also been the subject of the macroeconomic SWB literature that we build upon. Consistent with that literature, our aim is to capture the *overall* effects of those variables on SWB;

¹⁴ Region dummies have been found useful to control for unobserved heterogeneity in WVS data when the use of country-fixed effects is impeded by the circumstance that for many countries only one year of observation is available (Fischer 2010). We further investigated this issue by dropping the countries that have only one year of observation (Greece, Hungary, Luxembourg, New Zealand and Portugal) and including country-fixed effects in the regression. This reduced the degrees of freedom at the country-year level from 64 (77 country-years, 3 macroeconomic variables, 4 wave dummies, 6 region dummies) to 40 (72 country-years, 3 macroeconomic variables, 4 wave dummies, 25 country dummies). We found that the coefficients on inflation and growth retained their sign and significance and that their ratio was almost unaffected. The coefficient on unemployment became non-significant. This is explicable because the intertemporal (within-country) variation in unemployment is much smaller than the between-country variation (the standard deviations weighted by number of respondents being 0.91 and 3.54, respectively). Since the country-fixed effects absorb the between-country variation as the main source of identification, the coefficient estimate becomes very imprecise. For inflation and growth, by contrast, the within-country variation is larger, permitting precise coefficient estimates even with country fixed-effects.

to the extent that other variables, e.g. inequality, are influenced by the key macro variables, this approach encompasses the macro variables' impact through those channels (cp. footnote 3).

It is not clear in general whether life satisfaction should be treated as a cardinal phenomenon. If not, an ordered discrete choice model should be estimated rather than a linear regression model. Research that has applied both approaches has found little difference between the results of a linear regression and an ordered logit or probit (Ferrer-i-Carbonell and Frijters 2004). To facilitate interpretation, we used least squares as the primary method and an ordered probit as a robustness check. As a further robustness check we included GDP per capita as an additional independent variable.

We report heteroskedasticity robust standard errors corrected for clustering at the country-year level.

III. Macroeconomic performance and subjective well-being

A. Regression results

Table 2 reports the main estimation results for equation (1); detailed results are presented in Table A3 (see online appendix). The estimations were performed using least squares. To address issues of reverse causality, we performed robustness tests with the macro variables lagged one period and found our main results to be robust to this change. In addition, we performed weighted least squares estimations, using as country weights the inverse of the number of people surveyed in each country, and found the signs, significance, and magnitudes of coefficients to be robust to this check. Using an ordered probit maximum likelihood estimator does not affect the signs and significance of the coefficients as well as their ratios. Our discussion focuses on the macroeconomic variables.¹⁵

¹⁵ With respect to regions, people in Western and Eastern Europe, Asia and the Pacific region are found to be significantly less satisfied than people in Scandinavia, which is the base category. People in OECD America are not significantly different from people in Scandinavia. The lowest satisfaction level is found in OECD Asia, the second lowest in OECD Eastern Europe. Dummies for the waves of the WVS are found to be insignificant. With respect to the individual-level socio-demographic variables, all regressions yield the same qualitative results, and these results are consistent with common findings for developed countries (see Frey and Stutzer 2002 for a review): positive and significant coefficients on being female, being married or living together, and on income; negative and significant coefficients on being unemployed and on being divorced, separated or widowed; life satisfaction first decreasing then increasing in age (with turning point in the late 40s). In quantitative terms, large differences exist between being married and being divorced (about 0.62 on a 10-point scale) and between being (full-time) employed and being unemployed (0.85). See Table A3 in the online appendix.

Table 2. Main estimation results of life satisfaction regressions

| | A | B |
|---|-------------------|-------------------|
| Unemployment rate (<i>unemployment</i>) | -0.031*** (0.010) | -0.031*** (0.011) |
| Inflation rate (<i>inflation</i>) | -0.013*** (0.003) | -0.013*** (0.003) |
| GDP growth rate (<i>growth</i>) | 0.042*** (0.011) | 0.042*** (0.011) |
| GDP per capita (<i>income</i>) | | -0.001 (0.005) |
| Individual controls | Yes | Yes |
| Region dummies | Yes | Yes |
| Wave dummies | Yes | Yes |
| Observations | 91195 | 91195 |
| Adjusted R ² | 0.133 | 0.133 |

Note: Dependent variable: LS, life satisfaction (10-point scale). The rates of unemployment, inflation, and growth are measured in percent. GDP per capita is measured in thousand PPP-adjusted USD2000. Robust standard errors in parentheses are adjusted for clustering at the country-year level. Method: Ordinary Least Squares. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Regression A shows that life satisfaction is negatively and significantly related to the rates of unemployment and inflation and positively and significantly related to the rate of GDP growth. The coefficient on unemployment is about 2.38 as large (in absolute terms) as that on inflation and 0.74 times as large as that on the growth rate.¹⁶ Specification B adds per-capita income to regression A. This has virtually no effect on the coefficients on unemployment, inflation and growth. Per-capita income itself is found to be insignificant, which is consistent with the so-called happiness income paradox of a non-existing relationship between per-capita income and happiness (Easterlin et al. 2010).¹⁷

It may be noted that the small standard errors of the coefficients (relative to their mean) indicate a high degree of precision of the estimated relationships. We take this to indicate that preferences over the macroeconomic outcomes are rather stable across OECD countries and across time. This distinguishes our results from work based on developing and developed countries jointly, in which no significant relationships were found (Bjørnskov et al. 2005).

With respect to economic significance, a 1-percentage point increase in the unemployment rate is associated with a drop in life satisfaction by about 0.03

¹⁶ The coefficient estimates are consistent with earlier findings that a given rate of unemployment is more detrimental to SWB than is a rate of inflation of the same magnitude (Di Tella et al. 2001, 2003, Wolfers 2003).

¹⁷ See the discussion in the next subsection.

on a 10-point scale. To illustrate, this is about 5 percent of the effect of being shifted from ‘married’ to ‘divorced’ status, or more than 3 percent of the effect of *personally* becoming unemployed (which are among the life events that affect SWB most strongly; cf. footnote 11). The effect of a 1-percentage point increase in the inflation rate is somewhat less than one half in comparison with the unemployment rate, whereas the effect of a 1-percentage point drop in the GDP growth rate is about one third larger.

We consider regression A in Table 2 to be the preferred specification on which to base the index of national macroeconomic performance.

B. Income, growth and subjective well-being

Before discussing aggregate economic performance, it is worth clarifying how our estimation results relate to the literature on income, growth and SWB (see Clark et al. 2008 for a review). With respect to this, we emphasize that our measure of growth, which we find to be positively and significantly related to SWB, refers to short-term (year-to-year) fluctuations in national income. This is to be distinguished from papers that address the relationship between subjective well-being and long-term income growth. With respect to that issue, the seminal paper by Easterlin (1974) suggests that economic growth does not “improve the human lot” in terms of subjective well-being.¹⁸ In view of the differentiation between the short term and the long term, we do not regard the results of the present paper to be in contradiction to Easterlin’s position because, though we find year-on-year changes in GDP to be significant determinants of life satisfaction, levels of GDP per capita are insignificant. The latter is consistent with Easterlin’s findings.

A second point is that the insignificance of the level of per capita income in our life satisfaction regressions is not a contradiction to the often-cited finding that richer countries are happier countries. This latter finding mainly applies to rich countries as opposed to poorer ones, whereas within the group of wealthy countries (on which we focus) such a relationship can hardly be found (Clark et

¹⁸ The validity of this finding has been contested by Stevenson and Wolfers (2008), whereas Easterlin et al. (2010) defend the non-existence of a positive relationship between income and well-being over the long term. Di Tella and MacCulloch (2008) show that the happiness-income paradox is robust to inclusion of a large set of social and environmental control variables.

al. 2008). In addition to that, the region dummies in our regressions may capture some of the cross-sectional difference in per capita income.

Finally, it is useful to clarify what it is that we estimate when we simultaneously include GDP growth and household income. Since our household income variable captures the relative income position, the GDP growth variable is picking up the boost to SWB today from having been poorer in the past on *average*.

C. Macroeconomic performance of OECD countries

The coefficient on the unemployment rate, α , is usually taken to reflect the average person's fear of joblessness (Di Tella et al. 2001, Frey and Stutzer 2002), which is to be distinguished from the effect on SWB of personally being unemployed. The estimated coefficient on personal unemployment (relative to being full-time employed) is -0.848 (see Table A3 in the online appendix). We used this latter coefficient to compute an adjusted value $\tilde{\alpha} = -0.036$ instead of $\alpha = -0.031$, which accounts for the circumstance that a change in the aggregate rate of unemployment changes the number of unemployed persons and hence affects SWB through this additional channel (Di Tella et al. 2001).

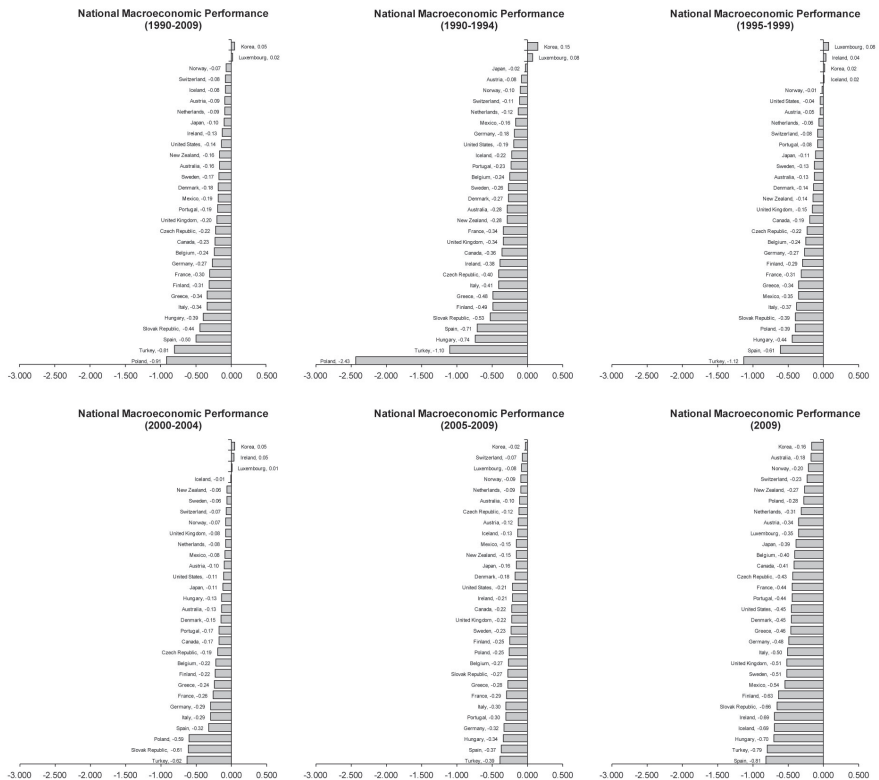
Using our estimation results, we computed an index of regression-weighted national macroeconomic performance (NMP) in terms of SWB as follows:

$$NMP_{ct} = -0.036 \cdot unemployment_{ct} - 0.013 \cdot inflation_{ct} + 0.042 \cdot growth_{ct}, \quad (2)$$

The index values can be thought of as representing the composite well-being effect by country and year of unemployment, inflation, and national income changes in comparison with a hypothetical situation in which these variables take values of zero. This index provides an indicator of national macroeconomic well-being.

Figure 1 presents the index values for our set of countries over the period 1990-2009 and several sub-periods. The information contained in this figure resolves the ambiguity of country rankings in terms of the three individual criteria discussed in subsection II.A.

Figure 1. National macroeconomic performance



Note: National macroeconomic performance is the regression-weighted contribution of the percentage rates of unemployment, inflation and annual national income growth to life satisfaction (LS): $NMP = -0.036 \text{ unemployment} - 0.013 \text{ inflation} + 0.042 \text{ growth}$ LS data are taken from the World Values Surveys and refer to 30 OECD countries. They are the response to the question "All things considered, how satisfied are you with your life as a whole these days?" and are coded for each individual from a score of 1 (dissatisfied) to 10 (satisfied). The regression equation includes individuals' socio-demographic characteristics and region and time dummies. $N = 91,159$; $Adj. R^2 = 0.133$. The coefficients on the macroeconomic variables are significant at $p < 0.01$.

With respect to the average across the entire period, the top three countries are South Korea, Luxembourg, and Norway, whereas the bottom three countries are Poland, Turkey, and Spain. While the index values of the top performing countries are close to zero, they are negative and rather sizable, in absolute terms, for the countries with poor performance. The difference between South Korea (top) and Poland (bottom) amounts to 0.99 on the 10-point life satisfaction scale. To illustrate in terms of personal circumstances, this is almost 120 percent

of the difference between personally being employed and unemployed (0.848). Comparatively poor macroeconomic performance thus has a similar effect on the average citizen's subjective well-being as if *everybody* was shifted from employed to unemployed status.

Considering the five-year sub-period 1990-1994, the difference between the bottom and the top amounts to 2.58, thus being more than 250 percent as large as in the overall time period. The differences in performance sharply decrease in the subsequent sub-periods, amounting to 0.36 in 2005-2009. During the macroeconomic crisis (2009) the range went up to 0.65. However, even in this year, national economic well-being of the worst performing countries was greater than in the first half of the 1990s.¹⁹

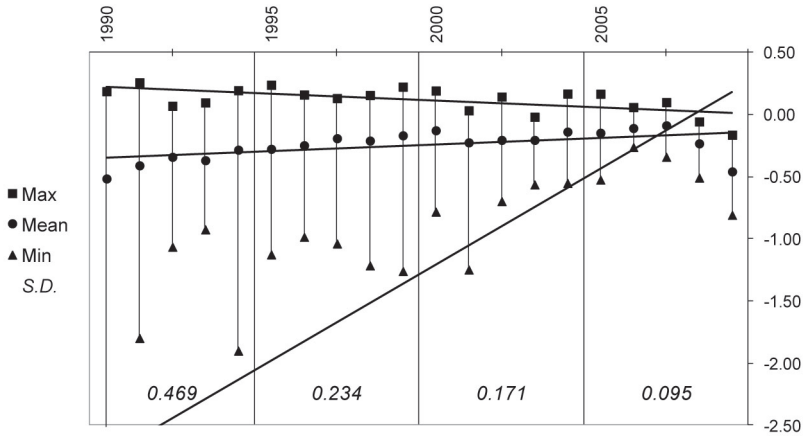
With respect to individual countries, macroeconomic performance was improving or stationary in most of the cases. Large improvements can be found in Poland, Hungary, and Turkey. In Poland, the index value in 2005-2009 was 2.18 points higher than in 1990-1994. To illustrate, this is more than 250 percent of the effect of changing from unemployed to employed status. In a few other countries, a deterioration of performance can be observed. A striking example is Germany, whose index value in 2005-2009 is 0.15 points lower than in 1990-1994. Japan, South Korea, and Luxembourg also display a declining trend in macroeconomic performance, though the decline is smaller.

Figure 2 provides an aggregate view of the OECD countries' macroeconomic performance through time. The following results stand out. First, mean economic performance (or mean economic well-being) across OECD countries has followed an increasing trend over the past two decades (which is significant if we disregard the crisis of 2008-2009). Second, performance in the worst performing countries has been improving tremendously. Third, the performance in the best performing countries has been deteriorating slightly. Fourth, the standard deviation of economic performance has been strongly decreasing over time.²⁰ The bottom line on this is that the past two decades have seen an increase and a convergence of macroeconomic well-being in OECD countries.

¹⁹ It cannot be ruled out that the weights people place on the different macroeconomic variables may have changed during the crisis. Data availability does not permit to check this possibility.

²⁰ The figure shows the standard deviation in five-year steps. The standard deviation in individual years (not shown) is significantly decreasing.

Figure 2. National macroeconomic performance in thirty OECD countries



Note: For national macroeconomic performance see legend to Figure 1. The figure shows the mean, minimum, and maximum values together with the corresponding trend lines, and the standard deviations for five-year sub-periods.

With respect to OECD sub-regions, there were improvements in economic performance especially in Eastern Europe, and less so in Western Europe, America, and Scandinavia. In addition, there was a convergence *within* all of those regions, that is, a tendency for the range and standard deviation to become smaller (see Figure A1 in the online appendix).²¹

IV. Macroeconomic performance and institutional change

A. Institutional change in OECD

Having measured the OECD countries' macroeconomic performance in terms of SWB, we turn to the role of institutional change for national macroeconomic performance. Previous research has identified positive economic effects of trade openness and improved institutional quality, especially as a support for

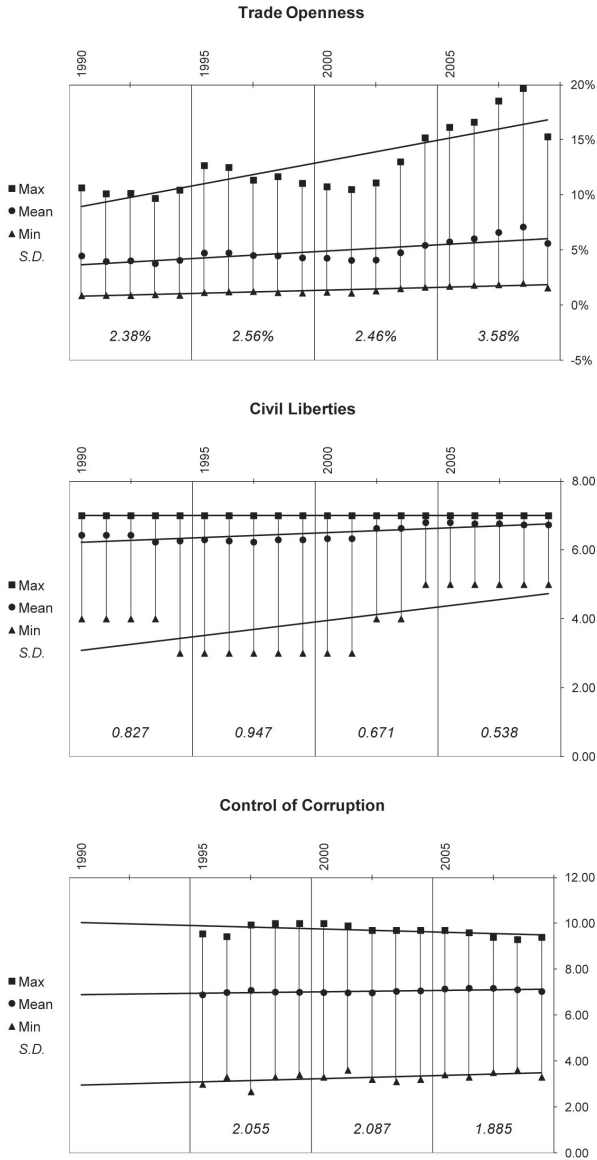
²¹ An exception is the standard deviation in the Asia-Pacific region (Australia, Japan, Korea, New Zealand) in the 1990s (for the purpose of this exercise, we collapsed the regions Asia and Pacific into one region.)

productivity (Sachs and Warner 1995, Frankel and Romer 1999, Acemoglu et al. 2001, Rodrik et al. 2004).

While economic integration is usually proxied by increased openness to international trade (Sachs and Warner 1995, Frankel and Romer 1999), institutional quality is a complex construct. With respect to institutional quality (or governance quality), it has been found useful to distinguish between two dimensions, one focusing on the operation of the democratic process and another relating to the effectiveness of the institutional framework within which individuals, firms, and communities operate (Helliwell and Huang 2008). We follow this differentiation and capture the former dimension by an indicator of the “respect of civil liberties”, while the latter dimension is captured by an indicator of the “control of corruption”. Civil liberties, in addition to their “ultimate” value associated with people’s desire for social and political participation, have been ascribed an instrumental value in their capacity to enhance economic development (Sen 1999). Similarly, control of corruption has been found to affect a variety of economic indicators that may be relevant for national economic performance (Judge et al. 2011).

Figure 3 provides an aggregate view of trade openness, the respect of civil liberties, and the control of corruption prevailing in OECD countries across time. In these diagrams, trade openness is measured in a standard fashion by the sum of exports and imports as a fraction of national income, civil liberties are measured on a scale from 1 (least free) to 7 (most free), and control of corruption is measured on a scale from 0 (highly corrupt) to 10 (highly clean). The diagrams illustrate that the mean values (across countries) of all three indicators show an increasing trend. With respect to openness, this reflects an increase in both the maximum and (to a smaller degree) the minimum values. In the case of civil liberties, the maximum values are constant (at the maximum of the measurement scale), whereas the minimum values have been rising after the turn of the century. With respect to the control of corruption, the maximum values have been decreasing somewhat, whereas the minimum values increased over the last one and a half decades. For both civil liberties and the control of corruption, standard deviations were decreasing. Increases in openness and the institutional improvements (especially in terms of civil liberties) were particularly pronounced in OECD regions Eastern Europe and America (see Figures A2-A4 in the online appendix).

Figure 3. Trade openness, civil liberties, and control of corruption in thirty OECD countries



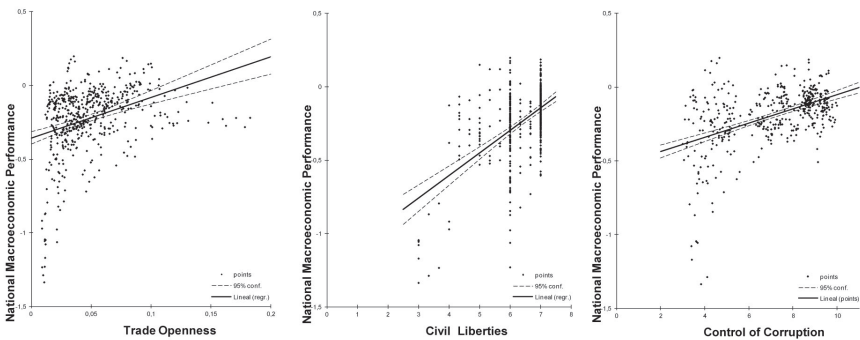
Note: Trade openness is the sum of exports and imports as a percentage of national income. Civil liberties are measured on a scale from 1 (least free) to 7 (most free), and control of corruption is measured on a scale from 0 (highly corrupt) to 10 (highly clean). The figure shows the mean, minimum, and maximum values of the respective variable together with the corresponding trend lines, and the standard deviations for five-year sub-periods.

B. The relationship between institutional change and macroeconomic performance

Given the significant relationships between inflation, unemployment and growth on the one hand and SWB on the other, it seems clear that the citizens of OECD countries have a preference for price stability, low unemployment, and growth. Since better democratic institutions and a lack of corruption foster a policy close to people’s preferences, we expect that civil rights and the control of corruption lead to better economic performance as perceived by the citizens. Likewise, openness to trade and international competition is likely to spur growth and employment and to impose discipline on prices. We therefore hypothesize that openness, democratic rights, and lack of corruption lead to improved economic performance, conceptualized as subjective economic well-being.

Figure 4 provides scatter plots of the index of national economic performance by country and year against 3-year moving averages of trade openness, civil liberties, and the control of corruption, respectively, and the corresponding regression lines. This analysis reveals that macroeconomic performance, in terms of SWB, is positively and significantly correlated to the degree of economic integration and measures of institutional quality, both across countries and time. Similar, though graphically less salient relationships are found when using current values instead of moving averages (see Figure A5 in the online appendix).

Figure 4. National macroeconomic performance by country and year



Note: National macroeconomic performance (30 OECD countries, 1995 - 2009) is plotted against 3-year-moving-averages of trade openness, civil liberties, and control of corruption.

We augmented this bivariate analysis by running a multivariate regression with the index of national economic performance by country and year as the dependent variable and the measures of trade openness, respect of civil liberties, and control of corruption as explanatory variables. The regression also included country and year dummies and was estimated using a linear least squares estimator:

$$NMP_{ct} = \tau \cdot trade_{ct} + \lambda \cdot liberty_{ct} + \kappa \cdot control_{ct} + \varepsilon_{ct}, \quad (3)$$

Table 3 shows that all three explanatory variables have sizeable and statistically significant positive coefficients.²² An increase of openness by 1 percentage point is associated with an increase in economic performance by 0.02 points, which implies that an increase by 1 standard deviation (1 SD) or 3.0 percent is associated with an increase by 0.06 points. An increase in respect of civil liberties by 1 point on the 7-point scale (by 1 SD or 0.82) is associated with an increase in performance by 0.12 points (0.10 points), whereas better control of corruption by 1 point on the 10-point scale (by 1 SD or 2.02) is associated with an increase in performance by 0.049 (0.099) points.

Table 3. Estimation results of national macroeconomic performance regressions

| Dependent variable: <i>NMP</i> | Coefficient | Standard deviation |
|--|-------------|--------------------|
| Trade openness (<i>trade</i>) | 1.769*** | 0.664 |
| Civil liberties (<i>liberty</i>) | 0.122*** | 0.019 |
| Control of corruption (<i>control</i>) | 0.049*** | 0.014 |
| Country dummies | | Yes |
| Year dummies | | Yes |
| Observations | | 501 |
| Adjusted R ² | | 0.673 |

Note: Regression of *NMP* (national macroeconomic performance by country and year for 30 OECD countries, 1993-2009) on *trade* (trade openness), *liberty* (civil liberties), and *control* (control of corruption). Trade openness is the sum of exports and imports as a decimal fraction of national income; civil liberties are measured on a scale from 1 (least free) to 7 (most free); and control of corruption is measured on a scale from 0 (highly corrupt) to 10 (highly clean). Method: Ordinary Least Squares. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

²² This finding is robust to including the explanatory variables lagged one period instead of the contemporaneous variables.

As a robustness check, we performed multivariate regressions of the index of national economic performance on alternative governance indicators, along with trade openness and country and year dummies (see Table A4 in the online appendix). Similar as “civil liberties” from Freedom House, the variable “voice and accountability” from the World Bank’s Worldwide Governance Indicators is positively and significantly related to the index of national macroeconomic performance. In the same vein, the variable “control of corruption” from the Worldwide Governance Indicators is positively and significantly related to the index of national macroeconomic well-being, similar as the corresponding variable from Transparency International. Trade openness also retains a positive and significant coefficient.

To gain more insight into the channels through which institutions affect overall macroeconomic performance, we ran regressions of the components of NMP on trade openness, respect of civil liberties, and control of corruption in Table 4. Trade openness has a significant positive impact on growth, but no significant effects on unemployment and inflation. Respect of civil liberties is significantly associated with more growth and lower inflation, but does not affect unemployment. Control of corruption is significantly related to more growth and less unemployment, but does not affect inflation.

Table 4. Regression of macroeconomic variables on institutional variables

| Dependent variable: | <i>growth</i> | | <i>unemployment</i> | | <i>inflation</i> | |
|--|---------------|-----------|---------------------|-----------|------------------|-----------|
| | Coeff. | Std. dev. | Coeff. | Std. dev. | Coeff. | Std. dev. |
| Trade openness (<i>trade</i>) | 40.902*** | 9.161 | -10.913 | 9.626 | 26.586 | 31.661 |
| Civil liberties (<i>liberty</i>) | 0.550** | 0.257 | 0.110 | 0.270 | -7.983*** | 0.888 |
| Control of corruption (<i>control</i>) | 0.673*** | 0.200 | -0.496** | 0.210 | -0.245 | 0.691 |
| Country dummies | Yes | | Yes | | Yes | |
| Year dummies | Yes | | Yes | | Yes | |
| Observations | 501 | | 501 | | 501 | |
| Adjusted R ² | 0.586 | | 0.739 | | 0.657 | |

Note: Regression of macroeconomic variables by country and year (30 OECD countries, 1993-2009) on institutional variables. Trade openness is the sum of exports and imports as a decimal fraction of national income; civil liberties are measured on a scale from 1 (least free) to 7 (most free); and control of corruption is measured on a scale from 0 (highly corrupt) to 10 (highly clean). Method: ordinary least squares. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

C. Discussion

We thus found evidence that trade openness and the quality of governance go with greater macroeconomic well-being in OECD countries. We acknowledge that these correlations do not establish causality. However, by using instrumental-variable techniques, previous research has shown that openness and governance quality impact on economic development rather than the other way round (Frankel and Romer 1999, Acemoglu et al. 2001, Rodrik et al. 2004), and we take these findings as an indication that the same direction of causality may apply to national macroeconomic performance as conceptualized in this study.

To put our results in perspective, we would argue that both increased openness and better governance are correlates of a more fundamental trend towards international integration within OECD over the last two decades (Sachs and Warner 1995). This view is consistent with the evidence discussed above that increases in openness and institutional improvements were particularly strong in countries of Eastern Europe and America which were confronted with requests for institutional reform in the process of accession to the European Union and the North American Free Trade Agreement, respectively. In addition to those formal requests for reform, institutional competition between countries may have risen in the face of increased economic competition (Sachs and Warner 1995, Bergh and Hojer 2008), thus contributing to institutional change. There are thus several political and economic channels through which international integration may have enhanced macroeconomic well-being in the OECD region.

V. Conclusions

Given that SWB has become increasingly important as a standard for assessing social and economic performance, this paper has used data of more than 91,000 individuals in thirty OECD member countries to assess the well-being effects of unemployment, inflation and national income growth. The relationships found were used to construct an index of national macroeconomic performance in terms of SWB. Applying the index to the period 1990-2009, we found that economic performance has improved in OECD overall and in the majority of countries, and that there has been a convergence of performance within the OECD.

Building on this index, evidence has been found that OECD countries' overall macroeconomic economic performance is positively related to institutional

change towards more trade openness and better democratic institutions and better control of corruption. The positive relationship between macroeconomic well-being and these institutions is consistent with the idea that civil rights and a lack of corruption foster a policy close to people's preferences as captured by the identified relationship between SWB and the macro variables.

Our estimates are based on a pooled cross-section time series over the past two decades. The high precision of the estimated coefficients suggests that preferences over the macroeconomic outcomes are rather homogeneous across OECD countries and stable across time. Nevertheless, it is an open question whether or not the macroeconomic disruptions due to the recent financial crisis may have affected people's macroeconomic priorities. This is an issue for future research that may be addressed when appropriate data become available.

Though the proposed performance index has a broader focus than the usual emphasis on growth, it disregards issues like life expectation and education. Including such factors, as are included in the Human Development Index (HDI), in a well-being regression might solve the problem of arbitrary weights in indices like the HDI. This might be a direction for future research.

Another direction that could be pursued is the question whether the index of macroeconomic well-being might be useful as an explanatory variable in the context of political economy issues such as government popularity and voting. Specifically, the index might be able to capture, through their impact on SWB, the effect of macro variables on voting for the incumbents or the opposition, or the role of those variables in explaining crises in political regimes.

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