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Happiness, Economic Well-being, Social Capital and the Quality of Institutions

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Happiness, Economic Well-being, Social Capital and the Quality of Institutions[1]

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
Abstract

Since Jeremy Bentham, utilitarians have argued that happiness, not just income or wealth, is the *maximand* of individual and social welfare. By contrast, Rawls and followers argue that to share a common perception of living in a just society is the "ultimate good" and that individuals have a moral ability to evaluate just institutions. In this paper we argue that just institutions, apart from their intrinsic value, also have an instrumental value, both in economic performance and in happiness. Thus happiness -- or subjective well being -- is analyzed as being a function of economic well-being, the quality of public institutions and social ties. Cross section individual data from citizens in OECD countries show that income, education and the perceived quality of institutions have the highest impact on life satisfaction, followed by social capital. Country analysis shows a non linear but positive influence of per capita GDP on life satisfaction, but also that unemployment and inflation reduce average happiness, the former effect being stronger. Finally, better quality public institutions and having more social capital also bring more happiness. We conclude with some policy implications.

JEL Codes: D63; D69; D78; J10; Z13

Keywords: Happiness, Democracy, Social Capital, Quality of Institutions

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1. Introduction

Early utilitarians, like Jeremy Bentham (1822), put the concept of happiness at the core of his analysis. Utility is merely the manifestation of "benefit, advantage, pleasure, good or happiness (all this in the present case comes to the same thing)". Classical utilitarianism is *subjectivist* (individual welfare is the subjective perception of it), *welfarist* (social welfare is the sum of individual welfare), *consequentialist* (the value of an action is to be judged by its consequences), and *hedonist* (the ultimate good is to maximize pleasure or happiness). It is no accident that economists have been emphasizing economic growth as an important aim of public policy. Higher material well-being, e.g. higher incomes, allow each person to pursue his or her perception of a lifestyle that brings more personal happiness and, under certain conditions, maximizes social welfare. Having made the theoretical connection between income (the instrumental observable variable) and happiness (the non observed maximand), social philosophers first, and economists later on, have focused the analysis on the "wealth of nations" following the path of one of Adam Smith's major works.

A second strand of literature follows the "justice as fairness" approach of John Rawls (1971), which is contractarian and non consequentialist. Rawls's analysis departs dramatically from the utilitarian tradition on at least three important issues. Firstly, the distinct aim of the analysis. It is not social welfare that Rawls is looking for, but principles to implement a just and well ordered society. "Among individuals with disparate aims and purposes a shared conception of justice establishes the bonds of civic friendship;...One may think of a public conception of justice as constituting the fundamental charter of a well-ordered human association" (p.5, 1971). Secondly, Rawls's conception of happiness departs from utilitarianism. He considers that happiness is not necessarily pursued by individuals with a rational plan of life, and it is not a central concept in his theory. Thirdly, individuals have two moral capacities: for a sense of justice and for a conception of the good. Thus, we may argue that it is consistent with Rawls's approach that, apart from the intrinsic value of just institutions, living in a well ordered society also impinges on the individuals' perception of happiness because it is in accordance with their sense of justice. Therefore, the quality of institutions must also be an ingredient of life satisfaction.

A third strand of literature is mainly empirical (Putnam (1993), Fukuyama (1995), La Porta, et al. (1997), Beugelsdijk, (2006), Slemrod and Katschak, (2005)) and has been analysing the relationship between trust or social capital on the one hand and the performance of

institutions on the other hand. Empirical evidence shows that social ties and trust are positively correlated with the performance of institutions.

Finally, there is a fast growing empirical literature on the economics of happiness (among many others see Frey and Stutzer (2000, 2002), Layard (2005a), Blanchflower and Oswald (2004), Clark and Oswald (1994), Easterlin (2001), Helliwell (2006), Helliwell and Huang (2008), Di Tella et al. (2001), and Veenhoven (1999). This literature has addressed the determinants of life satisfaction and typically has considered socio-demographic characteristics (age, gender, education), the role of income and other material and non material sources of subjective perception of well being. Some results seem robust: women are happier than men, age seems to have a U-shaped relation with happiness (after controlling for other variables, namely health), and income is one source of happiness (even with diminishing returns). However, there are still controversies and open issues. Is education positively related with happiness or does it not affect it? What is the relevance of the quality of institutions, namely the quality of government? Does this quality have dominance over income in explaining life satisfaction or is it the reverse? A further open issue is the marginal effects of several variables (e.g. income, education) on happiness.

The main aim of this paper is to contribute to the empirical literature on the determinants of happiness and therefore to give some additional empirical evidence related to the issues still in debate in the literature. We will analyse whether social ties and the quality of public institutions - apart from their direct impact on economic performance (and so indirectly on happiness) - have a direct impact on perceived happiness. In brief, we will try to isolate three possible determinants of happiness: economic well being, the quality of institutions and the quantity of "social capital" (measured by individuals' belonging to certain associations). The hypothesis underlying our research is that people are more satisfied with life not just because they are better off in material terms, but also because they live in a "better-ordered" society and have more social ties.

A secondary aim of the paper is to clarify the interest of well-being research not only for public policy but also to reinforce a theory of justice, as developed by John Rawls.

In section 2, we develop our theoretical argument and the relevance of well-being analysis for public policy. In section 3 we discuss the advantages and shortcomings of using World Values Survey data, with an emphasis on methodological issues and the selection of relevant variables. We also compute and interpret a country specific measure of happiness. In section 4 using cross section individual data, we analyse the determinants of life satisfaction taking into consideration three types of variables: material well-being (e.g. scale incomes), social

capital variables (e.g. participation in civic, political or religious associations) and subjective perception of the quality of institutions (e.g. the subjective perception of corruption). In section 5 using cross section country data, we analyse the same issue for a sample of OECD countries. The dependent variable is similar (average life satisfaction) but with fewer independent variables. Here we combine macroeconomic variables (log GDP, unemployment, inflation), with alternative measures of governments' quality and a "social capital" variable. Section 6 concludes, showing the connection between the utilitarian based well-being research, and the contractarian grounded theory of justice.

2. Well-Being, Life Satisfaction and Public Policies

According to welfare economists the goal of public policy should be to maximize some sort of social welfare function (S*WF)*, which has two main characteristics: it is *only* a function of individual utilities U^i, and it is a monotonic function of each individuals' utility.[2] For reasons of simplicity and the sake of our argument, let us interchangeably use the words "utility" and "happiness". If individual utility is a monotonous and non satiated function of its own income, and utility functions are not interdependent, i.e. if the happiness of each individual depends on his/her absolute income, and not the relative income with relation to some other individual, any increase in individual income, *ceteris paribus*, should increase individual and overall happiness. Given the ambiguity and subjective nature of "happiness" and "utility", over the last two centuries economists have shifted their attention to measuring material well-being (individual incomes or countries' GDP). In theory, we should expect that as individual income increases or as a country´s GDP per capita increases, the individual or average happiness should increase as well.[3]

This hypothesis can be tested if there is a reliable measure of "happiness".

Although initially seen with suspicion by economists, subjective measures of well-being are now more accepted within the profession, as shown by papers published in most major

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[2] In analytical terms $W = W(U^1, U^2, ..., U^n)$ and $\partial W / \partial U^i \geq 0$. The equal sign in the inequality relation is to cover a particular cases, e.g.: *i)* within the so-called Ralwsian Social Welfare Function (RSWF) when the well-off individuals in society get better-off, and social welfare does not change, given the *maximin* principle; *ii)* within a utilitarian (weighted-sum-of-utilities) welfare function when the weight to the very well-off is zero. In this section we will bear in mind only utilitarian social welfare functions. Rawls belongs to a different intellectual tradition, contractarianism, so that the typical microeconomist's approach to Rawls is reductionist. In section 6 we will come back to Rawls when discussing the implications of the type of research done in this paper.
[3] Insofar as country

economic journals using subjective indicators.[4] For a discussion of the issues raised by the use of subjective indicators, see, among others, Veenhoven (2002), Kahneman and Krueger (2006), and Diener and Suh (1997). The robustness of some empirical results and the fact that the same variables that seem to explain subjective happiness also explain objective acts of suicide (Helliwell 2004) provide additional support for the reliability of subjective information.[5] Two main type of methods have been used to measure subjective well-being. The first one results from a survey where individuals are asked how satisfied they are with their lives: the "survey life satisfaction" method. The other, is based on individual time allocation to several activities weighted by the subjective experiences ("net affect" or "unpleasant" experiences) associated with each. Both have advantages and shortcomings. In this paper we follow the "survey life satisfaction". The fact that there are reliable measures of "happiness" solves a problem. It is now possible to analyze the determinants of "happiness", namely income but also other non material causes, and see their relative importance. However, it does create a different problem: what should the indicator for measuring the effectiveness of public policy be: an indicator of subjective well-being (SWB) or an indicator of material well-being (MWB)? Should we have a national well-being index and accounts, or should we concentrate on GDP growth, national accounts, and income distribution?

Most economists are engaged in studying economic growth and income distribution, therefore giving priority to MWB. However, among economists doing "well-being" research, the degree of support for building SWB indexes and accounts[6] as a support for public policy differs. We may distinguish a prudent approach and a more enthusiastic approach.

Frey and Stutzer (2002) and Kahneman et al. (2004) are examples of a prudent approach. They believe SWB measures do not overcome all the problems faced by traditional notions and measures of utility in order to construct a social welfare function: SWB still faces the preference aggregation problem (having a cardinal utility does not solve all the Arrow type impossibility results) and the problem of missing incentives (governments may not have the correct incentives to maximize social happiness). Furthermore, SWB might be too prone to manipulation once people became aware that SWB is a goal of public policy (time allocation corrected happiness might be an alternative measure).

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[4] See references of this paper.
[5] Note that in cognitive psychology and sociology subjective information taken from surveys has been used for many decades. However, in economics it is a quite recent phenomenon.
[6] For a debate on the possibilities and limits of using SWB to inform public policy, see Dolan and White (2007).

On the other hand, Layard (1980, 2005a, 2005b), Frank (1997, 2005) and Ng (1978, 1997, 2001, 2003) clearly support the usage of SWB as a target for public policy[7]. They all believe traditional economic measures of well-being (such as GDPpc, productivity, unemployment, inflation, access to goods and services), or even other objective measures of welfare (such as life-expectancy and literacy rates, etc.) are incomplete and might lead to erroneous public policies. They think happiness should be considered as the ultimate measure against which everything else ought to be compared. For instance given the trade-off between inflation and unemployment, public policy should give more weight to the variable that is more relevant to happiness. Results in Di Tella et al. (2001), corroborated by results from this paper, suggest that it is employment that has a greater impact on subjective well-being. The tax schemes proposed by these authors (penalizing consumption and income, as income and consumption suffer from adaptation and comparison effects[8]) are also examples of public policies guided by SWB.

In this context, it is also important to analyze the relevance of "social capital" on happiness.[9] People with more "social capital" interact more with others in a multiple of associations and groups, and therefore they develop trust relationships with each other. Trust relations reduce transaction costs, improve the quality of public institutions and contribute to economic performance. Additionally, "social capital" may have a positive direct impact on happiness when the other factors are controlled for[10]. If such a relationship exists, we may derive implications for public policy. There is some argument to support measures that increase social interaction, social contacts and some form of communitarian life.

Last, but not least we may consider the direct effect of government institutional quality on happiness. There is already some empirical evidence that "just institutions" matter (see Helliwell (2006), and Helliwell and Huang (2008)). Assuming that individuals have a sense of fairness with respect to institutions (Rawls 1996), it is predictable that if they perceive the institutions as just, this will improve their happiness.

To recap, in this paper we use subjective well-being (SWB) as a benchmark of welfare: we analyze the relevance of material well-being, quality of institutions and degree of development of social ties ("social capital") by their impact on life satisfaction. We consider that

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[7] We have chosen these authors as they are amongst those who more clearly and explicitly support the implementation of SWB accounts as a tool for public policy guidance. Nevertheless, most economists engaged in happiness research would have a position close to this.
[8] The adaptation effect means that the individual compares his present income or consumption with past income and he is happier if the difference is greater. The comparison effect, means that each individual has a reference group and happiness is a function of the difference between his income and the one from the reference group.
[9] For a good bundle of papers on social capital - classic and modern - see Ostrom and Ahn (2003).
[10] See Konow and Earley (2008).

results from happiness research should be taken into account when formulating public policies, although we do not consider it as the "ultimate good" for reasons that we will make clear in the conclusions.

3. Methodological issues and the dataset

In order to evaluate perceived happiness, or more properly life satisfaction, we use the answer to the question "How satisfied are you with your life?" of the World Values Survey (WVS) dataset. In the survey, individuals choose an integer from 1 (dissatisfied) to 10 (satisfied) to answer that question.

The WVS is a widely used database within social sciences (namely sociology and political science).[11] Researchers such as Ronald Inglehart (who is behind the construction of this dataset), John Helliwell, Robert Mcculloch, Max Haller, Markus Hadler and Ruut Veenhoven have been using this data set. Also La Porta et al. (1997), Guiso et al. (2003), Knack and Keefer (1997), and Torgler (2005) use the WVS as a data source in their studies on trust, social capital and religion.

Economists have been more reluctant to use subjective data collected through surveys. However, there has been an increasing number of scholars publishing in economic journals using either the WVS or the United States General Social Survey (see Di Tella et al. (2001), Frey and Stutzer (2000, 2002), Oswald (1997), and Easterlin (2006)).

There has been some defence of subjective variables (Kahneman and Krueger (2006), Ng (1997), and Veenhoven (2002)). In particular, given the correlation between "happiness" questions and "life satisfaction", a choice must be made to select the endogenous variable. The "life satisfaction" (*SL*) wording has been considered more appropriate to measure "happiness" than questions using the word "happy" or "happiness", since in very different cultural backgrounds these words have different interpretations. Moreover, the scale used has been enlarged from three grades (in 1975) to a ten point scale, making it a more accurate measure (in the 1999-2004 survey).

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[11] The World Value Survey is a wide dataset containing information about individuals from 81 different nations worldwide. It is a micro data set as it contains personalized information for each individual for different moments in time (without being a panel though). It has information about values (social, religious, ethical, political, etc), socio-economic and demographic conditions of the respondents, attitudes on various domains and some questions addressing subjective perceptions of well-being. It has information on approximately 970 variables and 267870 individuals, is collected on a country base and has now data from five different waves (years): the first wave including years from 1981 to 1984, the second from 1989 to 1993, the third from 1994 to 1999, the fourth from 1999 to 2004 and the fifth from 2005 o 2006.

The strategy used to define our data set is first, to use mainly objective variables from the WVS (e.g. sex, age, belonging to such-or-such organization), and second, to use data from different sources: WVS, the Annual Macroeconomic Database (AMECO from the European Commission) and the Worldwide Governance Indicators (WGI) project. Therefore, we do not relate reported life satisfaction with other subjective variables (individual perceptions of corruption or of their perceived quality of social ties) because they could be proxies of one another.[12] In order to obtain coherence between the three datasets and work with a relevant and meaningful sample we restricted our analysis to 32 OECD countries.[13]

The aim of this paper is to analyze whether material well-being (MWB), levels of social capital (SC) and the perceived quality of institutions (QI) have an influence on life satisfaction (*SL*). As mentioned in the introduction, we will use a happiness measure as the dependent variable and economic well-being, quality of institutions and social capital variables as independent ones (alongside with socio-demographic controls). The analysis is developed at an individual level (micro) and country level (macro). The micro estimation will use the individual data from the WVS and will focus on finding the importance that individual economic well-being, subjective perception of the quality of institutions and the degree of social capital have on the individual level of satisfaction with life as a whole. By contrast, the macro estimation will try to understand how objective measures of institutions' quality, country economic environment and average social capital can explain a country's level of happiness (here we also use data from AMECO and from the Worldwide Governance Indicators).

4. Analysis with Individual Data

The individual data analysis tries to capture the effect of individuals' perception of institutions' quality, social capital and economic wellbeing (here only at an individual level) on self-reported satisfaction with life.

In order to specify the independent variables as proxies for individual level of social capital, economic wellbeing and perceived quality of institutions, we have chosen those with greater conceptual proximity to the reality under consideration and greater availability within the dataset. Social capital variables are objective measures of whether individuals belong to social

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[12] A similar argument was developed by Di Tella, MacCullogh and Oswald (2001) to use data from different sources.
[13] See Table 4 on appendix for details.

welfare services for the elderly organizations (*BSWSE*), religious organizations (*BRO*), youth work organizations (*BYW*), sports or recreation associations (*BSR*), women's groups (*BWG*), or other groups (*BOG*). The quality of institutions is measured by confidence in the police (*Cpo_QI*) and the perception of respect for individual human rights (*RHR_QI*). The personal economic well-being is indicated by income scales (*SIr*) to which the individual belongs. Finally, the socio-demographic variables considered are the usual ones: gender (*gender*), age (*Age*), highest educational level attained (*HEAr*), employment status (*ESr*) and number of children (*Nchild*)[14]. To allow for nonlinear effects on age we squared age (*Age2*). We have also decomposed *ISr* (see *ISr_D*), *HEAr* (see *HEAr_D*) and *ESr* (see *ISr_D*) in dummies for each respective level in order to grasp possible changes on the marginal effects (non-linear effects)[15].

We used the ordinal least squares estimation method since we take the dependent variable, satisfaction with life (*SL*) measured within a ten point scale (where 10 is the highest and 1 is the lowest level), to be cardinal[16]. Therefore, we run the following model[17]:

$$
\begin{aligned}
SL_i = {} & b_0 + b_1 Age_i + b_2 Age_i^2 + b_3 Gender_i + b_4 Nchild_i + b_5 ESr\_D2_i + b_6 ESr\_D3_i + b_7 ESr\_D4_i + \\
& b_8 HEAr\_D2_i + b_9 HEAr\_D3_i + b_{10} HEAr\_D4_i + b_{11} HEA\_D5_i + \\
& b_{12} SIr\_D2 + b_{13} SIr\_D3_i + b_{14} SIr\_D4_i + b_{15} SIr\_D5_i + \\
& b_{16} BSWSE_i + b_{17} BRO_i + b_{18} BYW_i + b_{19} BSR_i + b_{20} BWG_i + b_{21} BOG \\
& b_{22} Cpo\_QI_i + b_{23} RHR\_QI_i + bCD + u_i
\end{aligned}
$$

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[14] The belonging variables are dummies that take the value 1 when the individual belongs to the respective organization. *Cpo_QI* and *RHR_QI* vary between 1 and 4 where 1 stands for the maximum level of confidence and respect, respectively. *SIr* is a reduction to 5 levels of the 10 point scale of incomes presented in the WVS, where 5 is the highest scale of income. *HEAr* is also a reorganization of HEA of the WVS. Here, 1 stands for inadequately completed elementary education and 5 for some university without obtaining degree (for more details see table 7 in the appendix). *ESr* is also reorganized so that 1 is full-time employed, 2 unemployed, 3 housewife and 4 a collection of other statuses (see table 7 for details). In brackets the chosen abbreviation used with the package Stata. The WVS 4th wave for the 31 countries analysed (in this Micro analysis Portugal had to be omitted due to lack of data) covers the years of 1999 or 2000. The same years were used when choosing variables from AMECO (*GDPpc_PPS*, *Unem*) and from the World Bank (*GovDo*) for the Macro model. View Table 4 in the appendix for details. Also in the appendix are the descriptive statistics of these variables (Table 6).

[15] The omitted dummy (the reference point) is always 1 (the first income scale, having not completed elementary education and being full-time employed, for ISr, HEAr and ESr, respectively). With this, one can calculate the marginal effect of having more education or moving up on the income scale by comparison of consecutive dummies.

[16] It can be argued that a probabilistic model (as ordinal logit or probit) should be used instead as all we have is the sequential ten point observation of a latent continuous variable (the real satisfaction with life). Nevertheless, when the sample is large and the range of the variable is also large the statistical gains of using those methodologies are minor while the computational burden (namely to calculate and interpret marginal effects) is large. We follow Gardner and Oswald (2006), Helliwell (2008), Van Praag and Ferrer-i-Carbonell (2008) and others within the literature of Happiness in Economics who take the same route. Just to be sure, we have run an ordered logit on this equation with results that justify our choice (see table 7 in the appendix).

[17] Henceforth referred to as Micro model.

where *b* are the parameters to be estimated, *CD* are the country dummies[18], and *u* is the error term assumed to be Normally distributed with zero mean and uncorrelated with independent variables.

With OLS, parameters' estimations directly give information about the magnitude of the impact that each variable has on life satisfaction (SL). Statistic significance tests for each variable are also included in the table below.

Table 1

```
regress SL Age Age2 gender Nchil ESr_D* HEAr_D* SIr_D* BSWSE BRO BYW BSR BWG BOG
Cpo_QI RHR_QI count*

        Source |       SS         df        MS              Number of obs =   31904
-------------+------------------------------              F( 53, 31850) =  182.21
        Model |  40472.1859      53   763.626149            Prob > F      =  0.0000
     Residual |  133478.523   31850   4.19084844            R-squared     =  0.2327
-------------+------------------------------              Adj R-squared =  0.2314
        Total |  173950.709   31903   5.4524875             Root MSE      =  2.0472


------------------------------------------------------------------------------
          SL |     Coef.   Std. Err.       t     P>|t|      [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -.0588809   .0042573   -13.83   0.000***   -.0672254   -.0505365
        Age2 |   .0005766   .0000442    13.05   0.000***      .00049    .0006632
      gender |   .0566317   .0250839     2.26   0.024**     .0074664     .105797
       Nchil |   .0566444   .0090143     6.28   0.000***     .038976    .0743129
      ESr_D2 |   -.975161   .0492167   -19.81   0.000***   -1.071628   -.8786943
      ESr_D3 |   .1204712   .0460891     2.61   0.009***    .0301347    .2108077
      ESr_D4 |  -.0343442   .0292349    -1.17   0.240      -.0916458    .0229574
     HEAr_D2 |   .0624945   .0559265     1.12   0.264      -.0471236    .1721127
     HEAr_D3 |   .1443056   .0569474     2.53   0.011**     .0326865    .2559247
     HEAr_D4 |   .1514641   .0567856     2.67   0.008***    .0401622    .2627661
     HEAr_D5 |   .2653921   .0595417     4.46   0.000***    .1486881    .3820961
      SIr_D2 |   .4598833   .0341998    13.45   0.000***    .3928503    .5269163
      SIr_D3 |   .6854193   .0370454    18.50   0.000***    .6128089    .7580296
      SIr_D4 |   .8464046   .0414685    20.41   0.000***    .7651247    .9276846
      SIr_D5 |    1.00311   .0477053    21.03   0.000***    .9096058    1.096614
       BSWSE |   .0924316   .0457209     2.02   0.043**      .002817    .1820462
         BRO |   .2014645   .0347978     5.79   0.000***    .1332595    .2696695
         BYW |   .1492432    .054574     2.73   0.006***    .0422761    .2562103
         BSR |     .15403   .0323931     4.76   0.000***    .0905383    .2175218
         BWG |   .2121456   .0632958     3.35   0.001***    .0880834    .3362079
         BOG |   .1233263   .0460167     2.68   0.007***    .0331319    .2135207
      Cpo_QI |  -.2289291   .0151108   -15.15   0.000***   -.2585467   -.1993114
      RHR_QI |  -.2646146   .0159523   -16.59   0.000***   -.2958817   -.2333476

   Statistically significant at 95% (**), and 99% (***).
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From the results in Table 1 we can conclude that only educational level "2" and employment status "4" are not statistically significant meaning that, *ceteris paribus*, having completed elementary education does not add (statistically speaking, and even with the positive sign on *HEAr_D2*) to one's satisfaction with life (in comparison with not having completed that

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[18] Which are introduced in the analysis to get rid of possible country fixed effects. The complete results (with the coefficients for country dummies) can be seen in the appendix, table 5.

educational level). Having "other employment" status, rather than being employed full-time, (when one is neither unemployed nor a housewife) is statistically irrelevant in changing one's satisfaction with life (although the sign is negative).

All other variables are statistically significant at 99% of confidence (only *BSWSE*, *HEAr_D3* and gender are statistically significant at 95% of confidence) and all present the expected sign according to our hypothesis and the literature[19].

Trying to grasp now the relative importance of the independent variables (and grouping them by their type: economic domain, social capital, quality of institutions and socio-demographics) in explaining *SL*, the main results are the following:

The results for the controls (the socio-demographic variables) are in line with the robust results in the literature: *SL* is U-shaped in age[20], women are slightly happier than men (more 0.057 satisfaction points)[21] and being unemployed (in contrast with having a full-time job) drastically diminishes one's satisfaction with life (a 0.98 points drop). Concerning education, our results show that having higher education contributes to one's satisfaction (having attended university in comparison with not having completed elementary education adds 0.27 point on our satisfaction)[22].

With regard to the other broad determinants of happiness (social capital and quality of institutions in comparison with economic wellbeing), the economic domain (*SIr*) seems to have a similar impact on one's satisfaction with life as that of the perception of institutions' quality, and its impact is only a little bit greater than that of social capital levels. Belonging to the 5[th] level of the scale of incomes (in comparison with being at the bottom of that scale) adds roughly 1 point in our satisfaction with life. That means that (on average) for each jump on the SIr we get approximately 0.25 satisfaction points. That is also the impact of the quality of institutions (0.23 satisfaction points for each point in confidence gain for the police and 0.26 for each point more on the perception of respect for human rights) and similar to that of social capital variables (minimum for *BSWSE* with 0.09 satisfaction points gain and maximum for *BWG* with 0.21).

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[19] Note that Cpo_QI assumes the value 1 for "a great deal" and 4 for "none at all" and RHR_QI assumes 1 for "there is a lot of respect for human rights" and 4 for "there is no respect at all" which explains the negative coefficients.
[20] Although this is an expected result it should be pointed out that a cross section analysis is not the ideal way to analyze the life cycle evolution of happiness. A better analysis of the life cycle evolution of happiness was done by Easterlin (2006).
[21] This is also in line with some earlier empirical literature, e.g. Di Tella et al. (2001).
[22] We also got the result that being a house-wife adds to one´s satisfaction in comparison with being full-employed (which can be comprehended if most of these housewives have made a free choice and have achieved a greater life satisfaction being committed to family life rather than to a job) and that having more children also increases satisfaction.

This means that besides the already expected importance of money on ones' satisfaction with life, participating in social organizations (that is, displaying a higher level of social capital) and having a perception of living in a fair and safe society are as important for one's well-being.

Having proceeded with the *HEAr* and *ISr* decomposition into dummies, we can now evaluate the change in the marginal effects of these two variables: by subtracting consecutively the dummies' coefficients, we can access the impact of changing from one level to the next on both income and education. Table 2 reports these results:

Table 2

variable		coefficient	marginal effect
HEAr	D2	0.06249	0.06249
	D3	0.1443	0.08181
	D4	0.1515	0.0072
	D5	0.2654	0.1139
SIr	D2	0.4599	0.4599
	D3	0.6854	0.2255
	D4	0.8464	0.161
	D5	1.0031	0.1567

We can see that the changes in the marginal effects are different for education and income. While income presents a clear pattern of diminishing marginal effect (moving from income level 1 to 2 adds much more to one's *SL* than moving from level 4 to 5)[23], education exhibits a somewhat irregular pattern with the step from having completed secondary education to having university frequency (from 4 to 5) being the most relevant step of all. On the other hand, completing secondary education or not completing it (from 3 to 4) is almost irrelevant from a SL point of view.

Overall we may conclude that material well-being is an important determinant of happiness (though with diminishing marginal utility), but the perception of the quality of institutions has a similar relevance and social ties come third in relevance. This implies that they should be taken into account when evaluating individuals' welfare and policies to improve it.

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[23] Which is consistent with the idea of diminishing marginal utility of income, dear to early utilitarian and happiness' neo-utilitarian.

5. Analysis with country-level data

In the previous section we only took account of countries to get rid of possible countries' fixed effects and not to derive country specific conclusions. This section fills the gap, and we address the determinants of average life satisfaction (*SL*) across countries.

Our aim is also to study the impact of social capital, quality of institutions and the economic environment on happiness. We want to test the same relations as those previously tested in the Micro model using fewer and slightly different variables because we have fewer degrees of freedom[24]. The unemployment rate (*Unem*), inflation (*Inf*) and the logarithm of Gross Domestic Product per capita and at purchasing power parity (*lnGDP*) are the alternative indicators of the economic environment.[25] Average confidence in police (*Cpo_QI*) and a compilation of governance quality (*GovDo*[26]) are the indicators of institutions' quality. Finally, the social capital variable is the simple average of fifteen dummies concerning belonging (or not) to the fifteen different organizations displayed on the WVS dataset.[27]

Since SL_i is the average satisfaction with life for country i, we are dealing with a continuous variable in the interval [0,10]. Therefore, we can also use ordinary least squares for estimation of the following equations[28]:

Economic Well-Being:

MaM1 - $SL_i = b_0 + b_1 \ln GDP_i + u_i$

MaM2 - $SL_i = b_0 + b_1 \ln GDP_i + b_2 Unem_i + b_3 Inf_i + u_i$

Quality of Institutions:

MaM3 - $SL_i = b_0 + b_1 Cpo\_QI_i + u_i$

MaM4 - $SL_i = b_0 + b_1 GovDo_i + u_i$

MaM5 - $SL_i = b_0 + b_1 Cpo\_QI_i + b_3 GovDo_i + u_i$

---

[24] The equations are grouped according to the type of variables used. To be parsimonious (because now with only 32 data points (countries) we are working with much fewer degrees of freedom), we have only selected three variables for economic environment, two for the quality of institutions and one for social capital.

[25] Previous literature has found a nonlinear relationship between GDP and happiness (e.g. Helliwell and Huang (2008).

[26] *GovDo* is the simple average of the percentile rank of each country on four dimensions of governance quality as measured by the Worldwide Governance Indicators project (Kaufmann, Daniel), to wit, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.

[27] In brackets the chosen abbreviation used in Stata. As previously, the year used for each country can be seen in Table 4 in the appendix. Also in the appendix is Table 7 with these variables' descriptive statistics. These variables are aggregations for each country. For the variables from the WVS, the country's average is used.

[28] Due to some high levels of correlation between independent variables (see table 10 in the appendix for details), we run several separate regressions (for economic well-being, institutional quality and social capital). Once we put variables together, some changed sign (i.e. became inconsistent with the hypothesis) and lost significance.

Social Capital:

MaM6 - $SL_i = b_0 + b_1 belong_i + u_i$

Global Models:

MaM7 - $SL_i = b_0 + b_1 \ln GDP_i + b_2 Unem_i + b_3 Inf_i + b_4 Cpo\_QI_i + b_5 GovDo_i + b_6 belong + u_i$

MaM8 - $SL_i = b_0 + b_1 Unem_i + b_2 Inf_i + b_4 Cpo\_QI_i + b_6 belong_i + u_i$

Once more, *b* stands for parameters to be estimated and *u* for the random error term with the desirable proprieties.

The OLS estimation results are shown in Table 3[29].

Table 3

L	MaM1		MaM2		MaM3		MaM4		MaM5		MaM6		MaM7		MaM
	coef	p > |t|	coef	p > |t|	coef	p > |t|	Coef	p > |t|	coef	p > |t|	coef	p > |t|	coef	p > |t|	coef
GDP	1.3347	0.000***	0.9765	0.002***									0.9807	0.031**	
Unem			-0.0732	0.038**									-0.0808	0.019**	-0.0985
Inf			-0.0085	0.649									-0.0339	0.108	-0.0417
o_QI					-1.8359	0.000***			-0.731	0.169			-0.9125	0.052*	-0.8785
GovDo							4.293	0.000***	3.2586	0.005***			-2.9914	0.059*	
belong											0.7251	0.000***	0.1941	0.148	0.2393
uared	0.6765		0.728		0.3853		0.5049		0.5366		0.4417		0.7957		0.746
r Obs	32		32		32		32		32		32		32		32

Statistically significant at 90% (*), 95% (**), and 99% (***).

From the analysis of the results we can reinforce the conclusions of our micro analysis: the effect of both social capital and the quality of institutions is significant alongside the relevance of economic factors: *lnGDP*, *Cpo_QI*, *GovDo* or *belong*. All are highly significant when they are regressed alone over SL. Also the idea that income is the best proxy for satisfaction with life (once the curvilinear relationship is taken into account by the usage of the logarithm of income), followed by institutions' quality and social capital, can be witnessed by the diminishing R-square once one moves from regression MaM1 (for income) to MaM3 and MaM4 (for institutions) and to MaM6 (for social capital).

Once we move to the estimation with several variables (MaM7 and MaM8) things become less clear as some variables lose statistical significance and others change sign: in MaM7 (where all the variables are included) only lnGDP, Unem and Cpo_QI remain significant

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[29] In the appendix, table 11, you can find the complete results for regressions MaM1 to MaM8.

and with the expected sign. *However*, inflation (*Inf*) and social capital (*belong*) lose significance (although retaining the correct sign) and *GovDo* remain significant but with the wrong sign.

Only if we do not introduce *lnGDP* (as in MaM8) do we get the full expected results: unemployment and inflation contribute negatively to *SL*, and social capital and quality of institutions have a positive impact.

Using the sample's standard deviations of each variable as a reference for a typical movement of that variable, we can compare the impacts of the different variables on *SL*. Thus we find that economic variables have a greater impact on *SL* (for one SD of unemployment there is a 0,4 point reduction in *SL*, for one SD of inflation there is a 0,313 point reduction[30]). The institutional variables come next: for a SD increase in confidence in police (that is, lower *Cpo_QI*), there is a 0,287 gain in SL, and lastly the social capital variable (a SD increase in belong boosts SL by 0,212 points). This is in line with the results previously found in the micro analysis, which adds robustness to the present analysis.

6. Conclusions

The empirical evidence presented in this paper seems to support the hypothesis that life satisfaction is related not only to personal characteristics related to material well-being (e.g. income scale) and the usual socio-demographic characteristics (women are happier than men and young people are happier than old people), but also to the perceived fairness of institutions. Respect for human rights and confidence in the police are related to individual life satisfaction. This is a further empirical argument in support of a theory of justice. Just institutions are valuable for the functioning of a "well ordered society", and citizens in fact seem to value them and relate better institutions with enhanced life satisfaction. Of lesser importance, but still relevant, is the density of social networks that the individuals belong to. The higher the participation in social organizations, the higher the levels of life satisfaction.

These conclusions at the individual level become somewhat blurred at the country level since variance of country average life satisfaction is much less than intra country variance of individual life satisfaction. Nevertheless, we still observe that low levels of unemployment and inflation, high levels of civic participation and high confidence in the police are positively associated with life satisfaction.

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[30] The effect of the former is heavier than the latter, as already shown in the literature (Clark and Oswald (1994), Di Tella et al. (2001)).

When comparing our results with those in the literature we find some consistency among results, since it is not just material well-being that counts for happiness. However, it seems that material well-being is more important than some papers have suggested, particularly when we take into account that our sample comprised relatively rich countries.

Results from happiness research should be taken into account for public policy, because they add information for decision-makers on the impact of their policies. However, caution is advised for several reasons. First, even for a utilitarian decision-maker, the subjective perception of well-being can only be a rough indicator of happiness. In this case it should be complemented by other approaches such as time allocation on different activities and the subjective perception of these experiences. Second, if we depart from the utilitarian approach and join a Rawlsian approach, what really matters are just institutions. As stated in this paper, they may go hand in hand, in the sense that fairer institutions seem to bring more happiness overall. But in case of conflict, a Rawlsian approach gives a clear priority to justice.

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Appendix

Table 4 (code on WVS in brackets)

Code	Country (s003)	Year (s020)	Wave
40	austria	1999	4
56	belgium	1999	4
100	bulgaria	1999	4
124	canada	2000	4
191	croatia	1999	4
203	czech republic	1999	4
208	denmark	1999	4
233	estonia	1999	4
246	finland	2000	4
250	france	1999	4
276	germany	1999	4
300	greece	1999	4
348	hungary	1999	4
352	iceland	1999	4
372	ireland	1999	4
380	italy	1999	4
392	japan	2000	4
428	latvia	1999	4
440	lithuania	1999	4
442	luxembourg	1999	4
484	mexico	2000	4
528	netherlands	1999	4
616	poland	1999	4
620	portugal	1999	4
642	romania	1999	4
703	slovakia	1999	4
705	slovenia	1999	4
724	spain	1999.5	4
752	sweden	1999	4
792	turkey	2001	4
826	great britain	1999	4
840	united states	1999	4

Table 5 - Table 1 including estimation results of country dummies

```
regress SL Age Age2 gender Nchil ESr_D* HEAr_D* SIr_D* BSWSE BRO BYW BSR BWG BOG
Cpo_QI RHR_QI count*

      Source |       SS       df       MS              Number of obs =    31904
-------------+------------------------------           F( 53, 31850) =   182.21
       Model |  40472.1859      53  763.626149          Prob > F      =   0.0000
    Residual |  133478.523   31850  4.19084844          R-squared     =   0.2327
-------------+------------------------------           Adj R-squared =   0.2314
       Total |  173950.709   31903   5.4524875          Root MSE      =   2.0472


------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         Age |  -.0588809   .0042573   -13.83   0.000    -.0672254   -.0505365
        Age2 |   .0005766   .0000442    13.05   0.000       .00049    .0006632
      gender |   .0566317   .0250839     2.26   0.024     .0074664     .105797
       Nchil |   .0566444   .0090143     6.28   0.000      .038976    .0743129
      ESr_D2 |   -.975161   .0492167   -19.81   0.000    -1.071628   -.8786943
      ESr_D3 |   .1204712   .0460891     2.61   0.009     .0301347    .2108077
      ESr_D4 |  -.0343442   .0292349    -1.17   0.240    -.0916458    .0229574
     HEAr_D2 |   .0624945   .0559265     1.12   0.264    -.0471236    .1721127
     HEAr_D3 |   .1443056   .0569474     2.53   0.011     .0326865    .2559247
     HEAr_D4 |   .1514641   .0567856     2.67   0.008     .0401622    .2627661
     HEAr_D5 |   .2653921   .0595417     4.46   0.000     .1486881    .3820961
      SIr_D2 |   .4598833   .0341998    13.45   0.000     .3928503    .5269163
      SIr_D3 |   .6854193   .0370454    18.50   0.000     .6128089    .7580296
      SIr_D4 |   .8464046   .0414685    20.41   0.000     .7651247    .9276846
      SIr_D5 |    1.00311   .0477053    21.03   0.000     .9096058    1.096614
       BSWSE |   .0924316   .0457209     2.02   0.043      .002817    .1820462
         BRO |   .2014645   .0347978     5.79   0.000     .1332595    .2696695
         BYW |   .1492432    .054574     2.73   0.006     .0422761    .2562103
         BSR |     .15403   .0323931     4.76   0.000     .0905383    .2175218
         BWG |   .2121456   .0632958     3.35   0.001     .0880834    .3362079
         BOG |   .1233263   .0460167     2.68   0.007     .0331319    .2135207
      Cpo_QI |  -.2289291   .0151108   -15.15   0.000    -.2585467   -.1993114
      RHR_QI |  -.2646146   .0159523   -16.59   0.000    -.2958817   -.2333476
      count2 |  -.4384569   .0827192    -5.30   0.000    -.6005898   -.2763241
      count3 |  -1.893923   .0955248   -19.83   0.000    -2.081155   -1.706691
      count4 |  -.2586456   .0799663    -3.23   0.001    -.4153827   -.1019086
      count5 |  -.9790697   .0918468   -10.66   0.000    -1.159093   -.7990464
      count6 |  -.5979482   .0805458    -7.42   0.000    -.7558212   -.4400753
      count7 |    .097823   .0945858     1.03   0.301    -.0875688    .2832149
      count8 |  -1.692517   .0958665   -17.65   0.000     -1.88042   -1.504615
      count9 |  -.2639639   .0951628    -2.77   0.006    -.4504868   -.0774411
     count10 |  -.6965548   .0853822    -8.16   0.000    -.8639072   -.5292024
     count11 |  -.3081027   .0821294    -3.75   0.000    -.4690796   -.1471258
     count12 |  -1.215358   .0936234   -12.98   0.000    -1.398864   -1.031853
     count13 |  -1.722136   .0926778   -18.58   0.000    -1.903788   -1.540484
     count14 |  -.2402151   .0942475    -2.55   0.011    -.4249438   -.0554864
     count15 |  -.0235299   .0963152    -0.24   0.807    -.2123115    .1652516
     count16 |   -.644755   .0824813    -7.82   0.000    -.8064215   -.4830884
     count17 |  -1.300432   .0906256   -14.35   0.000    -1.478062   -1.122803
     count18 |  -2.053124   .0939478   -21.85   0.000    -2.237265   -1.868982
     count19 |  -2.183646   .0987187   -22.12   0.000    -2.377139   -1.990154
     count20 |  -.1405251   .1068799    -1.31   0.189    -.3500138    .0689636
     count21 |   .3546066   .0890913     3.98   0.000     .1799841     .529229
     count22 |  -.4619206   .0922566    -5.01   0.000    -.6427472    -.281094
     count23 |  -1.355504   .0902316   -15.02   0.000    -1.532362   -1.178647
     count24 |  -2.382085   .0929415   -25.63   0.000    -2.564254   -2.199917
     count25 |  -1.731384   .0875976   -19.77   0.000    -1.903079   -1.559689
     count26 |  -.4674643   .1022909    -4.57   0.000    -.6679585   -.2669701
     count27 |  -.7432827   .0813043    -9.14   0.000    -.9026424   -.5839231
     count28 |  -.5918729   .0921504    -6.42   0.000    -.7724912   -.4112546
     count29 |  -2.269391   .0901764   -25.17   0.000     -2.44614   -2.092641
     count30 |  -.5398033   .1044408    -5.17   0.000    -.7445114   -.3350953
     count31 |    -.55448   .0890789    -6.22   0.000    -.7290782   -.3798819
```

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```
      _cons |     9.4477    .1323504    71.38   0.000     9.188288    9.707111
--------------------------------------------------------------------------------
```

Table 6 - Micro model estimated by ordered logit, including country dummies

```
Ordered logistic regression                      Number of obs   =      31904
                                                 LR chi2(53)     =    8085.86
                                                 Prob > chi2     =     0.0000
Log likelihood = -63165.416                      Pseudo R2       =     0.0602


--------------------------------------------------------------------------------
         SL |     Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-------------------------------------------------------------------
        Age |  -.0524979   .0037518   -13.99   0.000*** -.0598513   -.0451446
       Age2 |   .0005228   .0000392    13.34   0.000***   .000446    .0005996
     gender |    .049236   .0215134     2.29   0.022**   .0070706    .0914015
      Nchil |   .0602703   .0080537     7.48   0.000***  .0444853    .0760553
     ESr_D2 |  -.7659987   .0431451   -17.75   0.000*** -.8505615    -.681436
     ESr_D3 |   .1243156   .0401563     3.10   0.002***  .0456107    .2030204
     ESr_D4 |  -.0044444   .0250189    -0.18   0.859    -.0534805    .0445917
    HEAr_D2 |   .0381702   .0507496     0.75   0.452    -.0612972    .1376377
    HEAr_D3 |   .1125828   .0513273     2.19   0.028**   .0119832    .2131825
    HEAr_D4 |   .1011611   .0511787     1.98   0.048**   .0008527    .2014694
    HEAr_D5 |   .1907809   .0533331     3.58   0.000***  .0862499    .2953119
     SIr_D2 |   .3628621   .0300496    12.08   0.000***  .3039661    .4217582
     SIr_D3 |   .5448687   .0323971    16.82   0.000***  .4813716    .6083658
     SIr_D4 |   .6967499   .0360146    19.35   0.000***  .6261625    .7673373
     SIr_D5 |   .8087867   .0410091    19.72   0.000***  .7284103     .889163
      BSWSE |   .0982502   .0393449     2.50   0.013**   .0211356    .1753649
        BRO |   .1878463    .029967     6.27   0.000***  .1291121    .2465805
        BYW |   .1407986   .0460941     3.05   0.002***  .0504559    .2311414
        BSR |   .1166858   .0271555     4.30   0.000***  .0634619    .1699097
        BWG |   .1861857    .054449     3.42   0.001***  .0794677    .2929038
        BOG |     .11236   .039034      2.88   0.004***  .0358547    .1888653
     Cpo_QI |   -.207675   .0133829   -15.52   0.000***  -.233905   -.1814449
     RHR_QI |  -.2052798   .0140955   -14.56   0.000*** -.2329066   -.1776531
     count2 |  -.5080661    .072288    -7.03   0.000     -.649748   -.3663842
     count3 |  -1.730576   .0849813   -20.36   0.000    -1.897137   -1.564016
     count4 |  -.3235329    .070089    -4.62   0.000    -.4609049   -.1861609
     count5 |   -.956801   .0809017   -11.83   0.000    -1.115365   -.7982365
     count6 |  -.7128975   .0700809   -10.17   0.000    -.8502536   -.5755414
     count7 |   .1079228   .0829356     1.30   0.193    -.0546279    .2704736
     count8 |   -1.58637   .0823066   -19.27   0.000    -1.747688   -1.425052
     count9 |  -.3663992    .080378    -4.56   0.000    -.5239372   -.2088613
    count10 |  -.8190859   .0739587   -11.07   0.000    -.9640424   -.6741295
    count11 |   -.405378   .0712514    -5.69   0.000    -.5450281   -.2657279
    count12 |  -1.151053   .0815628   -14.11   0.000    -1.310913   -.9911927
    count13 |   -1.62864   .0811046   -20.08   0.000    -1.787602   -1.469678
    count14 |   -.347493   .0802744    -4.33   0.000     -.504828    -.190158
    count15 |  -.0370428   .0849481    -0.44   0.663     -.203538    .1294525
    count16 |  -.7281216   .0721593   -10.09   0.000    -.8695512    -.586692
    count17 |  -1.301969   .0775159   -16.80   0.000    -1.453897   -1.150041
    count18 |  -1.826086   .0816694   -22.36   0.000    -1.986155   -1.666016
    count19 |  -1.921028   .0873355   -22.00   0.000    -2.092202   -1.749853
    count20 |  -.2067347   .0933617    -2.21   0.027    -.3897203   -.0237491
    count21 |   .6527941   .0827473     7.89   0.000     .4906124    .8149758
    count22 |  -.6354726   .0773821    -8.21   0.000    -.7871386   -.4838065
    count23 |  -1.316492   .0804723   -16.36   0.000    -1.474215    -1.15877
    count24 |  -2.106965   .0847735   -24.85   0.000    -2.273118   -1.940812
    count25 |  -1.626187   .0764758   -21.26   0.000    -1.776076   -1.476297
    count26 |  -.5331318   .0906275    -5.88   0.000    -.7107584   -.3555052
    count27 |  -.8744605   .0709836   -12.32   0.000    -1.013586   -.7353352
    count28 |  -.6467564    .079937    -8.09   0.000    -.8034301   -.4900827
    count29 |  -2.054424    .082677   -24.85   0.000    -2.216468    -1.89238
    count30 |   -.606985   .0904552    -6.71   0.000    -.784274   -.4296961
    count31 |  -.6365188   .0772762    -8.24   0.000    -.7879774   -.4850602
------------+-------------------------------------------------------------------
```

```
  /cut1 |   -5.960832    .1219982                        -6.199944    -5.72172
  /cut2 |   -5.455454    .1205672                        -5.691762   -5.219147
  /cut3 |   -4.800943    .1193098                        -5.034786      -4.5671
  /cut4 |   -4.300195    .1186136                        -4.532674   -4.067717
  /cut5 |   -3.498383    .1177734                        -3.729214   -3.267551
  /cut6 |   -2.947363    .1173311                        -3.177327   -2.717398
  /cut7 |   -2.181127    .1168713                        -2.410191   -1.952064
  /cut8 |   -1.035976    .1164622                        -1.264238    -.8077147
  /cut9 |   -.1025429    .1165506                        -.3309778    .1258921
-----------------------------------------------------------------------------
```

Table 7 - Descriptive Statistics for the variables used on the Micro Model:

```
    Variable |       Obs        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          SL |     31904    6.968186    2.335056         1         10
         Age |     31904    44.75135    16.66648        15         98
      gender |     31904    .5253573    .4993644         0          1
       Nchil |     31904    1.730943    1.551914         0         20
      ESr_D2 |     31904    .0678912     .251563         0          1
-------------+--------------------------------------------------------
      ESr_D3 |     31904     .101492    .3019838         0          1
      ESr_D4 |     31904    .4132397    .4924228         0          1
        HEAr |     31904     3.43098    1.195364         1          5
         SIr |     31904    2.686685     1.27571         1          5
       BSWSE |     31904    .0749122    .2632538         0          1
-------------+--------------------------------------------------------
         BRO |     31904    .1785983    .3830216         0          1
         BYW |     31904    .0514042    .2208242         0          1
         BSR |     31904    .1805103    .3846179         0          1
         BWG |     31904      .03708    .1889608         0          1
         BOG |     31904    .0706494    .2562424         0          1
-------------+--------------------------------------------------------
      Cpo_QI |     31904    2.372367    .8402523         1          4
      RHR_QI |     31904    2.313534    .8207859         1          4
```

Table 8 – Description of HEAr and ESr

```
HEAr - highest educational level attained r

 Level - Meaning
--------------------------------------------------------------------------
     1 - inadequately completed elementary education |
     2 - completed (compulsory) elementary education |
     3 - incomplete secondary school: technical/ incomplete secondary: university-preparatory |
     4 - complete secondary school: technical/vocational/ complete secondary: university-preparatory |
     5 - some university without degree/higher e university with degree/higher education |
--------------------------------------------------------------------------


ESr – employment status r

Number - Employment status |
--------------------------------------------------
     1 - full time |
     2 - unemployed |
     3 - housewife |
     4 - other / part time / self employed / students / retired |
--------------------------------------------------
```

Table 9 – Descriptive statistics for the variables used on the Macro Models (31 countries):

```
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          SL |        32    6.960625    .9650537        5.2       8.24
         HLY |        32    52.77038    8.902868    36.5031   63.69765
       lnGDP |        32    2.664687    .5947403       1.55        3.7
        Unem |        32     8.29425    4.057113      1.982       16.4
         Inf |        32     5.39875    7.505766      -1.76      33.29
-------------+--------------------------------------------------------
      Cpo_QI |        32    2.375313    .3262987       1.81       2.98
       GovDo |        32    .8028516    .1597235     .50025     .98075
      belong |        32       1.155    .8844864        .12       3.24
```

Table 10 – Correlation matrix for the variables used on the Macro Models

```
             |       SL      HLY    lnGDP     Unem      Inf   Cpo_QI    GovDo   belong
-------------+------------------------------------------------------------------------
          SL |   1.0000
         HLY |   0.9854   1.0000
       lnGDP |   0.8225   0.8873   1.0000
        Unem |  -0.6630  -0.6433  -0.5871   1.0000
         Inf |  -0.4380  -0.5007  -0.6045   0.0263   1.0000
      Cpo_QI |  -0.6208  -0.6360  -0.6468   0.4443   0.1151   1.0000
       GovDo |   0.7105   0.7708   0.9136  -0.5319  -0.5887  -0.6927   1.0000
      belong |   0.6646   0.6849   0.6303  -0.4946  -0.3139  -0.4673   0.5839   1.0000
```

Table 11 – Estimation results for the Macro Models

```
OLS Estimation of MaM1
regress SL lnGDP

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   62.74
       Model | 19.5322182     1  19.5322182           Prob > F      =  0.0000
    Residual | 9.33896873    30  .311298958           R-squared     =  0.6765
-------------+------------------------------           Adj R-squared =  0.6657
       Total | 28.8711869    31  .931328611           Root MSE      =  .55794

------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnGDP |   1.334651   .1684925     7.92   0.000     .9905429    1.678758
       _cons |   3.404198   .4596858     7.41   0.000     2.465395    4.343002
------------------------------------------------------------------------------

OLS Estimation of MaM2
regress SL lnGDP Unem Inf

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  3,    28) =   24.99
       Model | 21.0196626     3  7.00655421           Prob > F      =  0.0000
    Residual | 7.85152433    28  .280411583           R-squared     =  0.7280
-------------+------------------------------           Adj R-squared =  0.6989
       Total | 28.8711869    31  .931328611           Root MSE      =  .52954

------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnGDP |   .9764821   .2881311     3.39   0.002     .3862722    1.566692
        Unem |  -.0732401   .0336583    -2.18   0.038    -.1421859   -.0042942
         Inf |  -.0084971   .0184877    -0.46   0.649    -.0463674    .0293733
       _cons |    5.01195    1.06472     4.71   0.000     2.830971     7.19293
```

```
--------------------------------------------------------------------------------

OLS Estimation of MaM3
regress SL Cpo

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   18.81
       Model |  11.1252703     1  11.1252703           Prob > F      =  0.0002
    Residual |  17.7459167    30  .591530557           R-squared     =  0.3853
-------------+------------------------------           Adj R-squared =  0.3649
       Total |  28.8711869    31  .931328611           Root MSE      = .76911


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
      Cpo_QI | -1.835942    .423343     -4.34   0.000    -2.700524   -.9713607
       _cons |  11.32156   1.014722     11.16   0.000     9.249224    13.3939
--------------------------------------------------------------------------------


OLS Estimation of MaM4
regress SL GovDo

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   30.59
       Model |  14.5756898     1  14.5756898           Prob > F      =  0.0000
    Residual |  14.2954971    30  .476516571           R-squared     =  0.5049
-------------+------------------------------           Adj R-squared =  0.4883
       Total |  28.8711869    31  .931328611           Root MSE      = .6903


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
       GovDo |  4.293041   .7762282      5.53   0.000     2.707771    5.87831
       _cons |  3.513951   .6350311      5.53   0.000     2.217044   4.810857
--------------------------------------------------------------------------------

OLS Estimation of MaM5
regress SL Cpo GovDo

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  2,    29) =   16.79
       Model |  15.4928806     2   7.7464403           Prob > F      =  0.0000
    Residual |  13.3783063    29  .461320908           R-squared     =  0.5366
-------------+------------------------------           Adj R-squared =  0.5047
       Total |  28.8711869    31  .931328611           Root MSE      = .67921


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
      Cpo_QI | -.7309542   .5183963     -1.41   0.169    -1.791194    .3292853
       GovDo |  3.258584   1.059031      3.08   0.005     1.092623    5.424545
       _cons |   6.08071   1.924606      3.16   0.004     2.144448   10.01697
--------------------------------------------------------------------------------

OLS Estimation of MaM6
regress SL belong

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  1,    30) =   23.73
       Model |  12.7520569     1  12.7520569           Prob > F      =  0.0000
    Residual |   16.11913    30  .537304335           R-squared     =  0.4417
-------------+------------------------------           Adj R-squared =  0.4231
       Total |  28.8711869    31  .931328611           Root MSE      = .73301


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
      belong |  .7251338   .1488463      4.87   0.000      .421149    1.029119
       _cons |  6.123095   .2152821     28.44   0.000     5.683431    6.56276
```

```
--------------------------------------------------------------------------------

OLS Estimation of MaM7
regress SL lnGDP Unem Inf Cpo GovDo belong

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  6,    25) =   16.22
       Model | 22.9716228     6  3.82860381            Prob > F      = 0.0000
    Residual | 5.89956411    25  .235982564            R-squared     = 0.7957
-------------+------------------------------           Adj R-squared = 0.7466
       Total | 28.8711869    31  .931328611            Root MSE      = .48578


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
       lnGDP |  .9806972   .4287562     2.29   0.031     .0976573    1.863737
        Unem | -.0807527   .0321257    -2.51   0.019    -.1469169   -.0145884
         Inf | -.0339218   .0203756    -1.66   0.108    -.0758861    .0080424
      Cpo_QI | -.9124597   .4468345    -2.04   0.052    -1.832733    .0078132
       GovDo | -2.991429   1.510825    -1.98   0.059    -6.103033    .1201738
      belong |   .194055   .1301484     1.49   0.148    -.0739906    .4621007
       _cons |  9.545209   2.234794     4.27   0.000     4.942564    14.14785
--------------------------------------------------------------------------------

OLS Estimation of MaM8
regress SL Unem Inf Cpo belong

      Source |       SS       df       MS              Number of obs =      32
-------------+------------------------------           F(  4,    27) =   19.88
       Model | 21.5536215     4  5.38840538            Prob > F      = 0.0000
    Residual | 7.31756542    27  .271020942            R-squared     = 0.7465
-------------+------------------------------           Adj R-squared = 0.7090
       Total | 28.8711869    31  .931328611            Root MSE      = .5206


--------------------------------------------------------------------------------
          SL |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
        Unem | -.0984832   .0279234    -3.53   0.002    -.1557773   -.0411891
         Inf | -.0416637   .0132839    -3.14   0.004      -.06892   -.0144073
      Cpo_QI |  -.878517   .3373645    -2.60   0.015    -1.570732   -.1863022
      belong |  .2392798   .1358385     1.76   0.089    -.0394377    .5179973
       _cons |  9.812786   .8642275    11.35   0.000     8.039537    11.58603
--------------------------------------------------------------------------------
```