

Economic ethics and emotional well-being

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Abstract

This study is an evaluation of the emotional well-being of individuals when they are faced with economic acts. Herein, individual behavior is separated into two components: the ethics of *homo economicus* and a more general ethics. The model applied allows the quantification and separation of these two components using a data base on the measurement of well-being. The model is measured and evaluated for a set of European and North American countries. In conclusion, the model is validated and can be used to explain economic behavior from two positions: the ethics of *homo economicus* and a more general ethics.

Keywords: Utility function, emotional well-being, "*homo economicus*", economic ethics, rationality.

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Introduction

Economic science employs the concept of a “rational *homo economicus*”, a being that makes decisions regarding economic acts, whether behaving as a supplier or a consumer. In either case, according to the concept of rationality, individuals will only assume economic acts when these will maximize their economic wealth. According to the concept of rationality, the ethics of *homo economicus* implies that, for any economic act, it is ethical to maximize wealth. Thus, for a businessperson, all decisions must be guided by this principle such that decisions regarding investment, financing, and personal consumption implicitly follow an approach of the ethical maximization of wealth. Any decision that does not follow this principle is not acceptable given the logic of a rational *homo economicus* and, therefore, distances the subjects from their implied ethics.

The ethics of maximization originated with Hedonism and Utilitarianism. Economy as a science began with these concepts, quantitatively valuing both the pleasures and sacrifices inherent in every human action. It was in this context that the subject of study of economics, the rational *homo economicus*, and a set of implied ethics first appeared.

However, daily economic acts include decisions that do not necessarily consider the maximization of wealth or patrimony. Rather, a certain amount of wealth can sometimes be sacrificed for reasons that are not purely quantitative. Economic science interprets such acts, but always considering the underlying theory of the behavior of the rational *homo economicus*. All economic decisions normally contain aspects such as altruism, social responsibility, and the ethics of different schools of thought, religion, etc. The separation of the ethics of *homo economicus* from a more general ethics that encompasses other schools (e.g., the right to life, human rights, responsibility, etc.) used to justify economic decisions constitutes an interesting intellectual challenge. In this paper, these other concepts are referred to as “global ethics” in order to differentiate them from the ethics of *homo economicus*.

The intellectual challenges undertaken herein are how to separate the simultaneous presence of these two ethics within one person’s acts and how to evaluate the impact of these two ethics on human behavior. For this, an initial model is used in an attempt to measure these ethics. This model is applied to European and North American countries, and those behaviors corresponding to the economic ethics and those corresponding to the global ethics are analyzed. The separation of these two concepts offers a more global vision that clarifies the day-to-day behavior of persons when faced with economic decisions.

This paper covers the underlying conceptual approach upon which the ethics of *homo economicus* is based. This consists of determining the concept of utility and how economic science has resolved this aspect through a representation in a utility function. The study also shows the empirical verification of a new function for emotional well-being in European and North American countries.

I. Theoretical background

1.1. Conceptual origin of the utility function

The economic utility function is the result of an analytical and reflective process. In an article written between 1730 and 1731, the mathematician D. Bernoulli hypothesizes that the degree of satisfaction of all society can be determined by adding up the individual

satisfaction of every person. Based on this, Bentham (1776) formulated a concept of economic utility, giving rise to an autonomous line of thought. The utility function is represented by mathematical functions that implicitly incorporate the utilitarian approach. However, this vision does not always completely explain the acts involved in daily economic decisions. Indeed, this approach is limited when considering the individual as a more complex human being and is unable to explain human economic acts. A complete person is understood to be one who acts simultaneously as a biological, social, cultural, and economic being.

Utilitarianism seeks to maximize positive acts associated with good, correct pleasure and, at the same time, to minimize pain. Pleasure is associated with happiness, and the absence of pleasure is identified with unhappiness or pain. Thus, utility is that which gives the most happiness to the greatest number of people, thereby broadening the vision from one of individual utility to one of greater social breadth. Hedonism, in turn, has also influenced the development of the utility function through the ethical objective of obtaining the maximum good pleasure, rejecting malicious acts that can also generate pleasure. D. Hume (1711-1776), J. Bentham (1748-1832), and J. Stuart Mill (1806-1873) are prominent precursors to utilitarianism.

Schumpeter (1954) analyzes the influence of utilitarianism in the development of economic thought and states (pg.103, op.cit) that this form of analysis is a mechanistic philosophy for interpreting the universe and that the social attitude of this approach is a highly sublimated hedonism or egocentric *eudaimonia*. Schumpeter adds (pg.172) that utilitarianism is a philosophy for real life; he presents utilitarianism as a normative system with a marked juridical bias and also posits it as a social system. Other ethical schools of thought have been neutral with regard to the utility function analysis. Three relevant approaches have been taken in terms of the theoretical development of the utility function: cardinal utility, ordinal utility, and rational behavior theory. All three formulate theories for explaining how people react and their degree of satisfaction when faced with a choice between different possible courses of action.

The cardinal utility approach developed by Alfred Marshall (1920) indicates that utility has a quantifiable dimension in terms of the degree of satisfaction when choosing between different courses of action. This approach has hedonistic influences. Individuals may feel that a product gives them “y” units of satisfaction, but that the consumption of additional units gives them ever-decreasing units of satisfaction. In economic theory, this is known as decreasing marginal utility.

The ordinal utility approach was presented by John R. Hicks and R. G. Allen (1934). Unlike the cardinal analysis, this approach does not allow a quantitative measure of the utility function. Rather, persons faced with a decision have a scale of preference that orders the degree of desire for a product. The third approach, rational behavior analysis, was developed by John von Neumann and Oskar Morgenstern (1947). These authors assume that persons make decisions by considering the implicit risk of each option. This is seen as more of a representation of personal preferences. When faced with an economic decision, the risky option is compared with itself but under conditions of no risk.

A utility function fits all these valuations into one that represents and describes the behavior of persons acting as maximizers. Thus, individuals are homologous only when behaving as maximizers in a geometric and mathematical sense and their actions are well represented by said function. Seen thus, the utility function is an intellectual concept that simplifies analysis for economic theory.

1.2. Conceptual evolution of the utility function

In this approach utility is, mathematically and geometrically, a function of wealth, and greater utility is assumed to follow greater wealth. These functions are represented on the Cartesian axes, with wealth on the “x” axis and utility on the “y” axis. The logarithmic or D. Bernoulli function is the most commonly used. This function is: $U = \alpha \ln(W)$, where: W =level of wealth; U =utility; $\ln(W)$ =natural logarithm of wealth; and “ α ” is a parameter to be determined.

Each point shows the utility that corresponds to each level of wealth; *homo economicus* only moves over the combination of those points. The utility function is assumed to be increasing and limited: increasing because the level of satisfaction grows along with wealth and limited because individuals consider a level of satisfaction to be acceptable when falling between certain points.

Thus, personal economic actions are reduced to obtaining the maximum utility. Methodologically, this is explained through the mathematical maximization of the utility expected from an event involving the selection of only one of many possible options. In terms of expected utility, given a choice between two possibilities for obtaining retribution, the appropriate choice is that which offers the most expected utility. This is defined as the expected utility hypothesis, or the “rational behavior” of a person facing uncertainty.

This methodology, according to Laffont (1995), warrants two observations. First, the definition of the utility function with these normative suppositions is a working hypothesis from which it is necessary to deduce empirically verifiable implications. If these implications cannot be rejected based on the empirical work, it can be concluded that a person will act as if maximizing the expected utility. Second, the utility function is a normative interpretation that consists of demonstrating that rational agents “must maximize” their expected utility.

The concept of rational behavior contained in the above premises can be defined as the consistency of choosing as if through a lottery characterized by many paths of retribution. This interpretation is an economic definition, and the concept of “rational” must not be understood as a synonym of terms such as reasonable, prudent, just, impartial, etc. Rather, the meaning of “rational” should be related to the interpretation of economic rationality, meaning that *homo economicus* is only a rational being if behaving according to the economic rule based on a rational and empirical model. These two aspects – maximization and normative – are essential for understanding the concept of a rational being as it underlies these suppositions, given that every person is defined as being rational only when behaving under these two premises: as a maximizer of excellence and a being whose economic behavior is guided by this norm.

Carroll (1998) focuses on this aspect from the perspective of what Max Weber calls “the protestant ethic and the spirit of capitalism”, centered on the individuals’ search for wealth for their own use and possession as the main cause of the system and the individuals. The British economist, Joan Robinson (1962), indicates: “Utility maximization is a metaphysical concept of impregnable circularity”. Debreu (1966) shows the existence of continuous and non-continuous utility functions. The approach of Markowitz (1959) is based on the utility function. Pratt (1964) and Arrow (1971) establish ways for measuring the reward for risk. “Power utility functions” have been developed with complex

mathematical forms under the same normative principles, as indicated in Ait-Sahalia and Brandt (2001), Ang et al. (2000), Mehra-Prescott (1985), and Friend and Blume (1975).

In the case of ambiguous aversion to risk, which refers to the case of agents who do not know the distribution of returns and therefore cannot or simply do not wish to assign probabilities to a set of returns, Tversky and Kahneman (1992) propose another utility function family. Hwang and Satchell (2005) elaborate, starting from the Bernoulli utility function, the amount of wealth required to acquire information. The utility function has been used to explain donations, indicating that these behave similar to luxury goods. Inhaber and Carroll (1992) note that luxury goods (e.g., works of art, jewelry, and sporting goods) are generally associated with wealth and are, economically speaking, always goods and, therefore, subject to the pressure of any other economic good. In another article, Carroll (1998) states that love of wealth as a motivation is certainly extreme; other types of motivation include work satisfaction, status, philanthropic ambitions, etc.

Thus, the utility function theory has a philosophical base and is initially normative given that it assumes that persons behave exclusively as rational economic beings. This behavior is explained by one utility function and any other type of motivation would be well represented by said function. The utility function theory has followed the same methodological path as economics, that is, a hybrid mix of rationalism and empiricism in which normative and positive factors can intersect. Dagum (1995) is more categorical, stating that this hybrid mix combines a partial vision of ontological realism with epistemological and methodological idealism. From the point of view of knowledge theory, the rationalist and empiricist approach is present in financial theory, as shown by Parada (2008).

W. Sharpe (1970) represents the utility function through a quadratic function characterized by a maximum utility point for a certain wealth level. The function is as follows: $U = a + br - cr^2$, where U =utility; r =profitability rate, which replaces wealth W . a , b , and c are positive parameters. Beyond that point, the geometrical function decreases and, therefore, utility decreases as wealth increases. According to W. Sharpe, winner of the 1990 Nobel Prize in Economics, "this is clearly unacceptable". This is explained following the logic of economic rationality, showing the intersection between a normative and a positive focus, given that, in real life, some persons will effectively behave following this norm whereas others will not. Thus, certain daily economic acts will not be totally explained by the assumption of economic rationality and the ethics that this norm implies.

Interpreting an economic act solely from the point of view of economic rationality and its methodological representation through the utility function may give a partial result. Therefore, analyses of economic acts should consider the norm of economic rationality and its implied ethics to be only part of the analysis. The following paragraphs will tackle this idea from a more general viewpoint, following the same methodology of analysis used for the utility function.

II. Emotional well-being function

2.1. Definition of a new function

The function presented here is more global than the classic economic utility function explained in the previous points. This broader function explains the behavior of persons and companies by simultaneously incorporating the aspects of those following an economic rationale and those who are also motivated by other ethical valuations (Parada, 2004, 2009). This same model has been used to explain the economic crisis and sustainability policies of SMEs (small and medium-sized enterprises) (Brilius, 2010).

The original article mathematically demonstrates that the logarithmic utility function of the type $U(w)=\text{Ln}(w)$, which is commonly used in economics and finances, is an envelope for another family of curves of the type:

$$\text{BE}(w)=A_1\text{Sin}(\pi w)+A_2\text{Ln}(w)+c, \text{ with: } A_1+A_2=1 \quad (1)$$

where: w =wealth; $\text{BE}(w)$ =emotional well-being in function of wealth;

$\text{Ln}(w)$ =natural wealth logarithm; $\text{Sin}(\pi w)$ =sine of wealth; coefficients A_1 and A_2 are sensitivity weightings that each person or organization assigns to the global and to the economic ethics, respectively; c is a constant that is independent of wealth, and $\pi=3.1416$.

The function $\text{BE}(w)$ is shown to increase at some points and later decrease.

Moreover, this continuous function is enveloped by two logarithmic functions: the superior envelope $U_1(w)$ joins the function at the relative tangential maxima, whereas the points of the inferior envelope $U_2(w)$ are tangential and relative minima to the points of function $\text{BE}(w)$. Between these two are other functions $U_3(w)$ that differ only in the position of the coefficient c .

2.1. Interpretation of the emotional well-being function, $\text{BE}(w)$

Model $\text{BE}(w)$ is a rationalist vision and, therefore, is only as meaningful as a typically mathematical deduction of the logarithmic function. However, for a valid interpretation of the model in greater accordance with knowledge theory, the model must be adapted towards empiricism. Thus, an explicative model is generated using both rationalism and empiricism; this model theoretically supports the behavior of persons and companies as beings motivated simultaneously in each act by an economically ethical behavior (the ethics of the rational *homo economicus*) and by a more global ethical behavior that includes other schools of thought.

To comply with the previous statement and to interpret the mathematical function $\text{BE}(w)$, the following conditions are assumed: a) economically, all normative aspects of the utility function theory are fulfilled; b) the person's behavior is represented by the function $\text{BE}(w)$ and the envelopes $U_1(w)$ and $U_2(w)$, with $U_2(w)$ being the minimum required for emotional economic compensation for any decision and $U_1(w)$ being the maximum possible emotional compensation; c) other utility curves, denoted as $U_3(w)$, can exist between the maximum and minimum utility curves.

Emotional well-being is understood as the degree of satisfaction resulting from an act, whether it be motivated solely by the ethics of economic rationality or by a mix of this rationality and other non-economic ethics, in this case interpreted as a more global ethics.

Global ethics are considered to be more global in focus, including different personal values that are captured by $BE(w)$.

Coefficients A_1 and A_2 represent the relative weights that persons or institutions give to more global and economic ethics, respectively. As there are only two components, we assume that $A_1+A_2=1$. The original article assumes the existence of two ethics: global ethics represented by $A_1\text{Sin}(\pi w)$ and economic ethics represented by $A_2\text{Ln}(w)$.

Since $A_1+A_2=1$, if $A_2=1$, then $U_1(w)=BE(w)=\text{Ln}(w)$. This would mean that the behavior could be explained exclusively by the ethics of economic rationality, given that emotional well-being is totally explained by the traditional logarithmic utility function of Bernoulli. On the contrary, if $A_1=1$, the person would not place importance on economic ethics but would consider behavior as a complete person, motivated by other ethics and for reasons of social responsibility, to be primordial. In real life, persons can act simultaneously under both motivations, and cases in which $A_1=1$ or $A_2=1$ are extreme situations. Thus, the utility function theory $U(w)=\text{Ln}(w)$ is a particular case of the emotional well-being function and only valid when $A_2=1$.

Term “c” represents a minimum satisfaction, independent of the wealth of each person or company. When equal to zero, it implies that emotional well-being depends solely on wealth. Coefficient “c” is interpreted as the “enjoyment of belonging” for the case of persons that form part of an organization or society and that gain emotional satisfaction from belonging to it, independent of their wealth. This enjoyment can include factors such as organizational prestige, tradition and history, cultural factors, and other unique factors that characterize each society to which the person belongs.

For this new function, it is assumed that: a) the emotional sacrifices resulting from being distanced from economic ethics are covered by the emotional compensation provided by factors other than the ethics of *homo economicus*, and b) emotional well-being depends on wealth level “w” and on other factors captured by the position coefficient “c”.

III. Empirical analysis of emotional well-being and economic ethics

3.1. Model and hypothesis

The hypothesis is evaluated using model 1, from section 2.1. Starting from this model and incorporating the restriction $A_1+A_2=1$ in the $BE(w)=A_1\text{Sin}(\pi w)+A_2\text{Ln}(w)+c$ model, we obtain the following models:

$$BE(w)=\text{Sin}(\pi w)+A_2[(\text{Ln}(w)-\text{Sin}(\pi w))]+c \quad (2)$$

$$\text{or: } BE(w)=\text{Ln}(w)+A_1[\text{Sin}(\pi w)-\text{Ln}(w)]+c \quad (3)$$

Models (2) and (3) are used to test the hypotheses that A_1 and A_2 are statistically relevant, different from zero, and explain the importance each person or organization gives to economic ethics (A_2) and to ethics that are more global (A_1).

The hypotheses of this paper are the following:

a) The contribution of the economic and global ethics of each person or organization can be quantitatively evaluated and can explain their emotional well-being when faced with economic acts considering a perspective that is more general than the exclusively economical viewpoint. Statistically, this implies:

Null hypothesis: H_0 : the model (1) explains emotional well-being

Alternative hypothesis: H_a : the model (1) does not explain emotional well-being

b) The sensitivity coefficients used to weight the relevance of the global (A_1) and economic ethics (A_2) are statistically significant and different from zero, that is:

Null hypothesis: $H_0: A_1 \neq 0$ and $A_2 \neq 0$

Alternative hypothesis: $H_a: A_1 = 0$ and $A_2 = 0$

c) The base of emotional well-being depends on the location of the person or organization, which is verified through the following hypothesis:

Null hypothesis: $H_0: c \neq 0$

Alternative hypothesis: $H_a: c = 0$

3.2. Variables and countries considered

For the study, models (2) and (3) were applied for the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, United Kingdom, and United States of America.

The economic well-being index, based on the annual data in the data base of the Centre for Study of Living Standards (1980-2008), was used as a proxy variable for the emotional well-being (BE(w)) of the countries studied. In 1998, the Centre for the Study of Living Standards developed the Index of Economic Well-being, based on a paper written by Lars Osberg for the MacDonald Commission entitled *The Measurement of Economic Welfare*. The data base was taken from the Internet (www.csls.ca/reports/csls2009-11.pdf).

According to the Centre for Study of Living Standards, the index "...comprises the following four domains of economic well-being: a) Effective per capita consumption flows, including consumption of marketed goods and services; government services; effective per capita flows of household production; leisure; and changes in life span; b) Net societal accumulation of stocks of productive resources, including net accumulation of tangible capital; housing stocks; net changes in the value of natural resources stocks; environmental costs; net changes in the level of foreign indebtedness; accumulation of human capital; and the stock of R&D investment; c) Income distribution, including the intensity of poverty (incidence and depth) and the inequality of income; and d) Economic security from job loss and unemployment, illness, family breakup, and poverty in old age".

As a proxy variable for wealth (w), is used the index of the scaled log of total real per capita wealth from the Centre for Study of Living Standards, transforming it into a measurement scale.

3.3. Results and observations

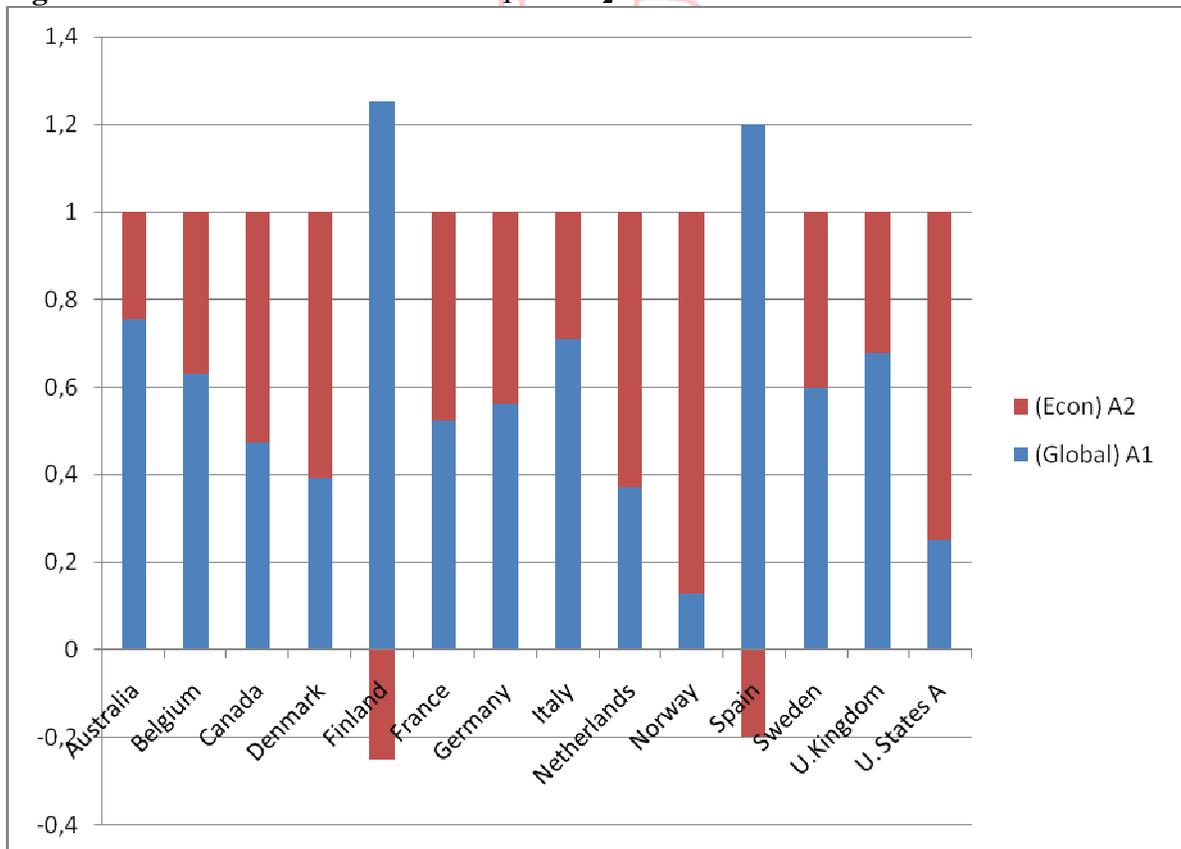
The econometric method OLS (Ordinary Least Squares) was applied to the aforementioned data bases using EViews of Quantitative Micro Software. The serial correlation correction method was used. Table 1 shows the results obtained.

Figure 1 shows the values of coefficients A_1 and A_2 . The "y" axis indicates the value of the coefficients and the "x" axis corresponds to each studied country. For all the countries in the study, the sum of $A_1 + A_2 = 1$ was met as a condition of the model. Thus, for example, for Australia, $A_1 = 0.754$ and $A_2 = 0.246$; this indicates that Australians weight global ethical behavior at 75.4% and the ethics of the *homo economicus* at 24.6%. In the case of Belgium, the weight of global ethical behavior is 62.8% and the remaining 37.2% corresponds to the ethics of *homo economicus*.

Table 1. Results of the model for measuring the coefficients A_1 and A_2

Countries	A_1	$t(A_1)$	A_2	$t(A_2)$	c	$t(c)$	F-statistic
Australia	0.754	5.24	0.246	1.71	-0.06	-0.24	2217.92
Belgium	0.628	5.54	0.372	3.28	0.23	1.62	4271.46
Canada	0.473	6.69	0.527	7.45	0.35	3.59	7002.69
Denmark	0.392	9.23	0.608	14.29	0.57	9.62	1635.16
Finland	1.251	17.11	-0.251	-3.44	-0.28	-0.05	343.61
France	0.521	9.55	0.479	8.77	0.38	4.37	4936.44
Germany	0.561	8.48	0.438	6.61	0.29	3.15	712.34
Italy	0.708	2.74	0.291	1.12	-0.01	-0.03	1251.77
Netherlands	0.372	6.36	0.628	10.72	0.54	7.05	505.57
Norway	0.125	4.15	0.875	29.17	0.82	36.65	1380.19
Spain	1.198	7.14	-0.198	-1.18	-0.92	-3.13	11442.55
Sweden	0.598	14.34	0.402	9.65	0.26	3.88	2995.71
U.Kingdom	0.677	6.27	0.323	3.00	0.08	0.42	3667.63
U. States A	0.249	7.39	0.751	22.30	0.56	1.68	2214.97

Figure 1. Values of the coefficients A_1 and A_2



The results of Table 1 and Figure 1 reveal the following:

- a) The global model explains the emotional well-being of the countries considered, as deduced from the statistical F-test. This implies that both variables, $Sen(\pi w)$ and $Ln(w)$, explain well the behavior of the inhabitants of the studied countries. Thus, hypothesis a), which guided this paper, is completely fulfilled.
- b) Coefficient A_1 , which measures the weight that the population of each country gives to the global ethics component, is statistically significant and is relevant in all analyzed countries. This is shown by the t-statistics $t(A_1)$ for each country. As this indicator is expressed in parts per unit given that $A_1 + A_2 = 1$, we can conclude that a high percentage of the emotional well-being of the populations is expressed by A_1 . For example, the importance that Australians give to global ethics is 75.4%. Thus, the remaining 24.6%, or A_2 , corresponds to the purely economic dimension. Coefficient A_1 exceeds 100% in two countries (Finland and Spain). This implies that, in those countries, behavior oriented towards a more global ethics is highly important and that these people sacrifice the relevance of *homo economicus* behavior. Indeed, for these countries, A_2 equals -0.251 and -0.198, respectively. This implies a sacrifice of the ethics of the rational *homo economicus* in favor of a more global ethics. In the remaining countries, both coefficients are positive and less than one, indicating that the importance of the two components is shared. The original model assumes that these coefficients should be positive. However, this normative supposition restricts the problem. Given this, we have eliminated this supposition, and the empirical data show that the coefficients can be negative. In such cases, the component with the negative coefficient is sacrificed so the other component can be greater than one, as in the previously mentioned cases of Finland and Spain.
- c) In all analyzed countries, coefficient A_2 is statistically relevant, as measured with the statistical test $t(A_2)$. Here, we can deduce that the classical utility function used in economic theory to interpret the behavior of economic agents has a complementary part. People only act completely within the ethics of *homo economicus* when $A_2 = 1$. However, this condition is not met in any of the studied countries, further validating the emotional well-being function as a more global representation than the classic utility function expressed by $Ln(w)$. Thus, from c) and d), we deduce the complete fulfillment of the hypothesis stated in this paper.
- d) In general, the position coefficient “c” is statistically significant. This coefficient is not statistically significant in only three countries (Australia, Finland, and Italy), where it has negative values. The interpretation of these results suggests that these three countries have no base for sustaining emotional well-being. In the case of Spain, the position coefficient is negative and statistically significant, which, according to the interpretation of the data, implies that this country presents a negative base for emotional well-being. Thus, hypothesis c) is fulfilled in most of the studied countries.
- e) Two of the studied countries (Finland and Spain) present a negative weighting for the behavior of *homo economicus*. This means that the data for those countries show that much greater importance is given to factors associated with global ethics as opposed to the ethics of *homo economicus*.

- f) As parameters A_1 and A_2 are statistically significant and considering the model presented by Parada (2004, 2009), the other part of the hypothesis is fulfilled: the emotional well-being function can be explained by both ethical components. This was stated as a partial hypothesis.

Conclusions

This study verifies that the quantitative importance of two different types of ethics can be separated within a person's emotional well-being behavior. The weighting factors of both ethics – the rational *homo economicus* and the broader vision of global ethics – allow analyzing the behavior of societies in the analyzed countries. We also conclude that the classic utility function with which economics theoretically resolves the problems is a particular case of the emotional well-being function, given that the weighting coefficient of *homo economicus* ethics is not equal to one, or $A_2=1$, in any of the analyzed countries. This last observation and result shows that the emotional well-being function developed herein is broader than the traditional utility function. Another relevant conclusion shows that both ethics referred to in this paper coexist simultaneously in the analyzed countries as explicative factors of emotional well-being.

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