Electronic Journal of Applied Statistical Analysis
EJASA, Electron. J. App. Stat. Anal.
http://siba-ese.unisalento.it/index.php/ejasa/index
e-ISSN: 2070-5948
DOI: 10.1285/i20705948v13n2p498

Economic growth and mental well-being in Italian regions
By Antolini, Grassini

Published: 14 October 2020

Electronic Journal of Applied Statistical Analysis
Vol. 13, Issue 02, October 2020, 498-518
DOI: 10.1285/i20705948v13n2p498

Economic growth and mental well-being in Italian regions

Fabrizio Antolini[a] and Laura Grassini*[b]

[a] *Università degli Studi di Teramo, Facoltà di Scienze della comunicazione, Italy*
[b] *Università degli Studi di Firenze, Dipartimento di statistica, informatica, applicazioni, Italy*

Published: 14 October 2020

Measuring economic growth is not only an arithmetic problem, it also involves an economic vision and a philosophy for the choice of indicators (i.e. Gross Domestic Product). Today it seems more relevant to measure not only the economic well-being as it is, using Gross Domestic Product, but also the people's well-being, considering other dimensions such as health and happiness. Over the years, national accounts and Gross Domestic Product have never changed their nature, instead combining social and economic indicators can offer important indications for well-being research. As pointed out by the World Health Organization, health is well-being, but it is not always coincident with a high level of Gross Domestic Product. In particular, as regards the mental health condition it has become an important aspect in measuring people's well-being. Mental health has been considered an important signal of the society's discomfort due to economic growth that, generally, is argued to be caused by the disamenities of the "industrial lifestyle". This study involves an empirical investigation using a panel econometric model in Italian regions, considering antidepressant expenditures per capita (an expression of society's unhappiness) as the dependent variable and, as covariates, the old age index, the poverty rate, the employment rate, the NEET rate (NEET: Not in Education, Employment, or Training), and the percentage of public expenditure in services.

keywords: GDP, happiness, national accounts, well–being

*Corresponding author: laura.grassini@unifi.it

ISSN: 2070-5948
http://siba-ese.unisalento.it/index.php/ejasa/index

1 Introduction

The measure of economic growth has always been a goal for politicians and citizens. In the beginning, despite the different methodologies proposed, economists agreed to include whatever form of a new utility produced in the gross domestic product (GDP) in the economic system. Despite the particularly intense debate regarding the representativeness of the national accounting aggregates, the basic concept of the national accounting system – i. e. the measurement of the income produced – has never been modified. In this way and for a long time, the activities of social welfare remained difficult to measure and include in the framework of national accounts. Only with the review of the European System of Accounts in 1995 (Eurostat, 1995), after the more general revision of the United Nations System of National Accounts (United Nations 1993), welfare activities began to be represented. For that purpose, the aggregate of adjusted gross household income was introduced, obtained by adding the social transfers in kind to the disposable income aggregate. In recent years, however, politicians have shown interest beyond the income produced, in also knowing the well-being of the population, which is not measured either by GDP or by other national accounting aggregates.

The disconnection between income and well-being has been underlined by the authors of numerous studies (Diener, 2000; Diener and Seligman, 2004; Costanza et al., 2009; Antal and Bergh, 2014). Unfortunately, well-being is a complex phenomenon and the empirical evidence about its measure is conditioned by the choice of the methodology and indicators used. Moreover, there are many definitions of well-being (Hone et al., 2014) in which the health dimension is always included. In particular, Layard (2012) underlined how mental health programs could improve *subjective well-being* (SWB) more than other policies. The relationship between well-being and subjective well-being needs to be examined in depth because the indicators used for their measurement are different (Diener, 2006; Diener et al., 2009 Diener and Tov, 2012; Kenneth et al., 2012). There is an awareness that governments should offer society those factors capable of granting more satisfactory living conditions (Ribeiro and Marinho, 2016). From this point of view, the analysis of the possible relationships between lifestyles, prosperity, and happiness (or SWB) are now more important.

In understanding and measuring the discomfort of society, using the rate of depression, anxiety, or stress, it is important to understand whether this is a consequence of the modernization process (Hidaka, 2012) or not (Klerman and Weissman, 1989; Wittchen et al., 1994; Kessler et al., 2007; Bhugra and Mastrogianni, 2004).

The aim of this study is to verify the relationship between regional well-being measured by antidepressant expenditures and certain economic and institutional aspects of Italian regions.

To start (Section 2), we will focus on the national account aggregates and their capacity to represent the welfare state activities and well-being. Next (Section 3), we will stress the importance of psychological conditions to explain the economic operators' decisions. Finally (Section 4), we will provide empirical evidence (using a panel model) about the relationship between the indicators proposed to represent subjective well-being with some selected socio-economic indicators. Final remarks are given in the last section.

2 National economic accounts, welfare state, and well-being: beyond GDP

Economic growth measured by the increase in GDP, has always been interpreted as the main objective of public policies. From the beginning, the discussion about which economic phenomena should be included in national income was very intense. In the 1930s, Kuznets (1934) provided a time series of national income to have a quantitative basis for studying and measuring economic growth and the shifts in production from agriculture to industry to services. He refused to include estimates of household production. Kuznets also strenuously objected to the counting of all government spending on goods and services as part of the GDP because he regarded most expenditures of that type to be intermediate, not final, products (Kuznets, 1948a; Kuznets, 1948b). In contrast, Stone (Stone et al., 1942; Comin, 2001) developed a double-entry accounting system, also in the 1930s and 1940s, partly driven by the British government's war effort. His social accounting matrix implemented many cross checks on the validity of the components of national income and, in so doing, he derived methodologies for measuring them. He demonstrated, empirically as well as theoretically, that national income could be measured using the "value-added method" that is equivalent to the final production or to the income distributed. Stone's framework became the foundation for the United Nations System of National Accounts (SNA), first published in 1953, providing a uniform basis for all countries to report national output. As a last step, Keynesian theory enforced the use of national accounts in explaining its general "disequilibrium" model.
All these economists concluded that the income produced should have to represent the creation of a new utility produced by the economic system, possibly distinguishing "productive" and "unproductive" activities (Studensky, 1958). In compiling national accounts, the precondition was that this utility could have a monetary value and that is why some non-market activities were not included. The debate about the representativeness of national account aggregates was particularly intensive after the Second World War. Despite the revision of some important accounting rules and definitions, the concept of income, in terms of monetary value, has never been changed (Antolini, 2016), and the main aims remained to be a tool for macroeconomic policy.
However, the measurement of income is not only an arithmetic issue: In fact, "to arrive at national income result, the national accounts need to establish what the nation is" (Mitra-Khan, 2007). As pointed out by Bos (2017), after the birth of the national accounts system (United Nations, 1968), economists were aware that the welfare activities were not sufficiently represented in the structure of national accounts. Only after the revision of the System of National Accounts (United Nations, 1993) and, consequently, of the European System of National Accounts (ESA 1995), an important innovation occurred in that direction. It regarded the distinction between public services, that are provided to households on an individual basis – e.g. health, education – and those provided to the community, on a collective basis. This distinction allowed policymakers

and researchers to better understand how resources were distributed within the economic system. In fact, while the government pays for the production of collective and individual services, in the latter case household members are the actual consumers. In this way, the *actual individual consumption of households* or, the *adjusted gross disposable income of households*, was introduced among the aggregates of national accounts.
Those per capita aggregates are the only ones available for measuring the welfare at the national level but are not yet produced at a regional level. Table 1 reports the adjusted disposable income for the years 2006 (i.e., before the recession), 2009 (the first registered recession in some countries such as Italy), 2012 (the second registered recession in some countries such as Italy), and 2017 (when all the countries came out of the recession).
As shown in Table 1, because of EU economic rules, some countries have been subjected to budgetary constraints on a more than occasional basis: Greece, Italy, Spain, and Portugal; these are the ones with a lower welfare state activity.

Table 1: Adjusted gross disposable income per capita of households (in Purchasing Power Standard)

Countries/Years	2006	2009	2012	2017
Euro area (19 countries)	20589	20973	21937	23638
Denmark	18660	19840	21780	24125
Germany	22676	23274	26071	28473
Greece	18358	19263	15116	14768
Spain	18366	18319	17563	19336
France	21321	21889	23433	25022
Italy	20830	20908	20982	21804
Luxembourg	30130	30322	30906	32681
Netherlands	22852	23554	23863	24696
Austria	23612	23870	25692	26730
Portugal	16188	16335	15786	17733
Finland	18608	20910	22953	24169
Sweden	19705	21440	23480	24543
United Kingdom	21826	21505	22535	23597

As pointed out in both SNA 2008 and ESA 2010, many aspects should be included separately from the central core of the national accounts, by using satellite accounts (e.g., the change in welfare; the analysis of the income and expenditure of households on the basis of micro-oriented concepts of income and expenditure; the interactions between the environment and the economy). Turning to the satellite accounts tool, each country

can provide information in a very flexible way.
In the last SNA documents (United Nations 2018), and also considering the Stiglitz-Sen-Fitoussi Commission (Stiglitz et al., 2010), these concepts are reaffirmed. Those documents indicate that estimates of the main aggregates should be made by including the quantitative impact of unpaid households' activities on traditional measures of economic activity. However, the System of Environmental Economic Accounting (SEEA), still to be implemented, does not consider human conditions and well-being (United Nations 2018). Another issue, common to all economists studying national accounts, was the international comparability of economic aggregates, as reported by Stone in the Appendix to the UN Report of 1947 United Nations, 1947).
Relating to countries' GDPs, the authors of most comparative studies have not sufficiently considered the historical context, the institutional structure, and some important methodological statistical aspects. For all these reasons, that type of analysis risks becoming only a statistical exercise. It should be clear that if the historical or spatial context has changed, the capacity of GDP or Gross National Product (GNP) to represent the social aspects of the community can be different (Antolini, 2016). Also in the last SNA manuals (United Nations, 2018; Eurostat, 2010), the importance of having a comparable GDP across countries is once again highlighted.
However, differences across countries occur even in the sources utilized in measuring some aggregates, in particular as regards the intangible assets (Hill, 2014; Corrado et al., 2017), illegal economy, and capital depreciation. For instance, the capital depreciation is computed using business administrative data in France, while it is estimated by the perpetual inventory method in Italy. Additional differences are concerned with the contribution of intangible assets to gross capital formation.
Furthermore, in a globalized world with a large presence of multinational companies, the reconciliation between global outputs of the firms and the national value added (GDP) is complex. Finally, there are some countries that do not yet have a comparable national accounts aggregate, such as China and India (Xumei, 2015; Lequiller and Blades, 2014; Maddison, 2005, Maddison, 2007).
The measure of GDP (or GNP) involves a paradigm, a philosophy of growth, which is that of economic well-being. Yesterday and today, some authors have proposed a revisiting of the paradigm of final goods and services (GDP) to represent the well-being condition. In previous years it was said, "Some have deplored the pursuit of high growth in GDP as a goal, asserting that it distorts national priorities, does not improve or may even worsen the distribution of income, and irreparably damages the environment" (Mitra-Khan, 2007). As a measuring road, GNP gives incorrect indications of changes in welfare, mainly because it fails to allow for the disamenities associated with industrial growth, particularly air and water pollution. Therefore, it is necessary to have an adequate index of welfare (Jorgenson and Slesnick, 2014; Moss, 1973). A current remark includes in representing the economic well-being, that GDP does not consider some important variables, suggesting changing this philosophy of growth. GDP measures the flow of goods and services produced within the market, but many important economic activities are entirely excluded from GDP measurements, such as volunteer work, social capital formation within healthy family units, the costs of crime and an increasing prison

population, and the depletion of natural resources (OECD, 2007; Costanza et al., 2009, Stiglitz et al., 2010).

Subsequently, domestic policy tends to be focused heavily on economic outcomes, although economic indicators omit, and even mislead regarding much of what society counts (Diener and Seligman, 2004). In different periods, more and more actors (people, policymakers, researchers) asked to know whether the nation's rate of economic growth is sustainable (Van de Ven, P., 2019). A new perspective has to be researched, as the concept of sustainability has changed, going beyond the environment and including the individual well-being and some features of human health. In fact, during those times of change, while many organizations measure economic material living standards through the GDP growth, it is clear that well-being should be considered as a complex concept: "dictionary definition differs, but notions of prosperity, health and happiness generally figure the same" (Boarini, R., Johansson, A. and Mira d'Ercole, M., 2006).

Economic accounts do not represent the country's social conditions, although income plays an important role in the enhancement of quality of life (Veenhoven, 1991; Veenhoven, 1996). Social conditions are something more complex and "income" is only a part of that; to examine this, we have to analyze the country's economic development and not just economic growth (Przeworski et al., 2000). In measuring well-being, social context is relevant (Helliwell and Putnam, 2004; Helliwell et al., 2009) although, since the Constitution of the World Health Organization (1948), well-being appears as a tautological concept of health: In fact, "health is well-being". Despite that circularity, public health database and policy formulations consistently return to well-being as both social and individual phenomena in such contexts as local violence, inequality, poverty, homelessness, resource allocation, and social welfare (Manderson, 1948). Over the years, human well-being has been linked only with the ecosystem, in particular water and wetlands or, more generally, with the environment (Assessment, 2005). Some researchers have argued that quality of life or happiness is a new paradigm of growth (Veenhoven, 2012a, Veenhoven, 2012b). If the debate on the paradigms of quality of life is not new, a multidisciplinary sight is necessary in order to provide sound measures of sustainable economic growth (Strack et al., 1991; Van de Ven, P. (2019)). The disconnection between GDP and well-being is proven in some studies, such in Antal and Bergh (2014) and Costanza et al. (2009), who also corroborated that the loss in leisure time and the depletion of natural resources are a measure of "negative externalities".

Over time, many attempts have been made to construct an alternative or complementary measure of GDP. For example, in 1972 a *Gross National Happiness Index* (GNHI) was created in Bhutan and it became internationally known in 1986. The concept implies that *sustainable* development should take a holistic approach toward notions of progress and equal importance should be given to non-economic aspects of well-being. Recently, relying on the Bhutanese GNH Index, the Social Progress Index has been proposed by *Social Progress Imperative*, considering very large dimensions (Social Imperative Foundation, 2018). The New Economic Foundation (NEF) has developed the*Happy Planet Index* (HPI) for the United Kingdom, which considers life expectancy indicators, ecological preservation, and levels of quality of life satisfaction (Diener et al., 2009; NEF, 2019). The United States proposed the *Genuine Progress Index* (GPI). In addition, the

OECD has developed the *Better Life Index* (OECD, 2017), a multidimensional index that would track the trend of quality of life. In Italy the BES (well-being and sustainability) dashboard was introduced (Istat, 2018).
As pointed out by Antolini and Simonetti (2018), all these measures of well-being have met some methodological problems in the construction of composite indicators (OECD, 2008). Too often, there is a conceptual misunderstanding in comparing GDP with these indicators (Yilmaz, 2017). First, independent from the methodology utilized (the selection of indicators and the construction of the composite), researchers highlight that a measure of well-being should not replace but only be complementary to the economic ones. Secondly, in doing so, researchers should preserve the theoretical framework of the national account and try "to define the object measured (quality of life or happiness) before investigating it" (Kim-Prieto et al., 2005; Antolini and Simonetti, 2018). Instead, statistical data or indicators are too often utilized without a link to these measures or to their conceptual, theoretical framework. Therefore, they lose a part of their representativeness, coherence, and relevance (Holloway and L., 2003).

3 Mental health and new economic performance measures

Layard (2012) suggested that better mental health programs can improve subjective well-being more than any other policy. The happiness and mental health of citizens, and what they are worth for the community, should be evaluated for policy design. A national well-being index or subjective well-being (happiness) may become an important tool for guiding public policies. Well-being and even more SWB have become a "public good", and governments should offer society those factors capable of granting more satisfactory living conditions (Ribeiro and Marinho, 2016).
In addition to the attempts by private foundations or some National Statistical Institutes (NSI) to construct a multidimensional index of well-being, it is necessary to reflect on the possibility of extending the national accounts system. The final goal should be to adjust GDP for disamenities of *industrial life*, in particular accounting for the social life of individuals, imputing values of leisure time (Eisner 1989). In fact, if two countries produce the same level of final goods and services (GDP), the one that involved fewer worked hours generates more leisure time, that can be employed in social or wellness activities. However, in the context of the national accounts, it is important to establish whether leisure time is an input or an output, because only in this latter case (being final goods) would it be possible to attribute a monetary value to leisure time.
The mental accounting of time and analyzing its allocation among different activities can be useful for describing the human decision making process that is not always rational (Rajagopal, 2009; Thaler, 2018). Diener (2000) and Diener et al. (2015) proposed a national account index of *subjective well-being*, but in this case the analysis shifted to a rather different field. In fact, while well-being is a multidimensional phenomenon measurable by objective indicators, SWB is a psychological and individual dimension measurable by subjective indicators (Diener and Tov, 2012). Individual and psychological conditions are important for explaining economic operators' decisions. From the

macro-economic point of view, traditional economists emphasize the role of the markets in coordinating the decisions of the firm and its consumers. In contrast, behavioral economists examine the behavior of the individual decision makers because they constitute the market (Baddeley, 2013; Bernheim and Rangel, 2004). For traditional economists, individuals and firms are rational, and that means their decisions are based on available information. For behavioral economists, people's decision making tools are incomplete or unrealistic; personalities and emotions can influence working life, educational attainment, and economic and financial decisions. Perhaps at the same time, personality and emotions can be influenced by economic circumstances which would have feedback on people's emotional states. A more depressed person may feel despondent and resentful about engaging in economic transactions (Elster, 1998; Lee et al., 2009). For these reasons, behavioral economists look not only to macroeconomic performance in terms of monetary value but prefer to observe the psychological aspects of subjective well-being, as conditions of happiness and unhappiness.

In measuring SWB, researchers meet two main problems: one is that SWB (or happiness) is a perception and depends on the context; the other is the self-reported investigational methodology utilized to measure happiness (Antolini and Simonetti, 2018). An undoubted advantage of SWB measures is that they capture individual experiences. Compared to this, objective social indicators are indirect measures of how people feel about their life conditions. For this reason, it is important to observe whether or not the results of these two categories of indicators in measuring the "well-being world" converge.

Another advantage of subjective indicators is that they do not involve a different unit of measures, as is the case with objective indicators. On the other hand, subjective indicators seem to be too volatile (Schwarz and Strack, 1991; Oswald and Wu, 2010; Andrews and Withey, 2012). In this view, public health data are useful tools for measuring elements of the collective mood such as some types of mental illness and stress-related illness, interpreted as a measure of the "discomfort of society" (Antolini, 2016). In fact, as the wealth of society increases with changing economic conditions, the number of illnesses and the most important causes of health and disease change as well. Some of this – stress and depression – is likely determined by the speed with which individuals live and by their growing state of "uncertainty", with their psychological well-being (or SWB), which can directly influence physical health (Selye, 1974). In countries with a high level of social and economic inequality, where we found a large segment of the population in poor conditions, the community is less likely to be happy and optimistic (Platt et al., 2017). Disadvantaged social situations such as unemployment, low income, debt, and poor housing are associated with worsening mental health conditions (Macintyre et al. 2018). These factors are more frequently found in marginal groups, but depression, anxiety, and stress are becoming typical in modern societies (Hidaka, 2012).

Since society's lifestyle is connected to different forms of capitalism (Carpenter, 2000), the welfare systems and policies can influence both the quantity and quality of people's work-life balance. In addition, the time available for individual health influences the probability to have, during life, a good level of social relations. People with friends and those who belong to associations or have the support of others have better phys-

ical and psychological health. Enjoying social activities is possible when a person has leisure time. Policies which improve the connection between social and economic life of individuals, facilitate social relationships, thus increasing the possibility to be happy or to achieve a good level of SWB. Those conditions are not always sufficiently satisfied in societies nowadays, particularly in large, urban places (Mellander et al., 2011). In the Netherlands, Denmark, and Finland, where the welfare system has the primary goal of achieving *flexicurity*, voluntary part-time employment is higher among women, with positive effects on their children's lives. In France, there are other kinds of public policies (alternative to the ones for welfare), such as tax breaks and the money supply, to better combine life and working time (OECD, 2017).

In addition, financial initiatives can improve the welfare system. For instance, scholarships and micro-credits for young entrepreneurs can be useful for promoting social mobility and enhancing the expectations of young generations (Adler et al., 1994). Happiness (or SWB) consists of "doing what you want to do, and not in doing whatever you want" (Antolini and Simonetti, 2018). Therefore if it is a precondition to have a high level of SWB, it is important to construct an open society in which people have a greater opportunity of choice, so they can improve the probability of their social mobility (Antolini, 2013; Brooks, 2010; Brooks, 2013). For young generations, this means looking ahead with optimism and hope, which reduces their uncertainty about the future. Instead, declaring the "urge of human activities for progress" is equivalent to saying that a society's discomfort exists because of individuals' lifestyles that are too fast and productive (Blanchflower and Oswald, 2008; Latouche, 2008,Latouche, 2011; Muraca, 2012). In this case, the psychological and well-being needs are sacrificed.

Perhaps this is not the only possible interpretation. It is possible to reverse this logical causation syllogism, considering happiness as a variable that can improve productivity (Zalensky et al., 2008). This fact is particularly evident in small and medium enterprises (SME). Namely, the literature of small business economics and cognitive psychology suggests that SME entrepreneurs, more inclined to high levels of stress (Saraf et al., 2018), can influence the level of productivity of their firm (Oswald, 1997). A historical example is that of the Italian industrial district, where the gap in productivity due to the small size of establishments is compensated for by the climax of harmony and the process of identification between the workers and the establishments where they work (Antolini and Boccella, 2006; Becattini, 2004). In the new corporate organizational models, human resources departments are more and more involved in the creation of pleasant workplaces with open spaces and wellness services.

Mental health well-being makes up an integral part of an individual's capacity to lead a fulfilling life, including the ability to form relationships, study, and work or pursue leisure interests, as well as the ability to make day-to day decisions. The determinant of mental health and well-being resides in the relationship between individual attributes and the environment in which a person lives (Manderson, 1948; World Health Organization (2012)). Policies to promote mental health are important also to improve economic performance, considering that an economic system is, primarily, a social system (Thaler and Sunstein, 2008). However, the discomfort of societies, as measured by an increase in the rate of depression, anxiety, or stress, cannot be considered in a stationary state of the

modern society (Klerman and Weissman, 1989; Breslau et al., 2005; Bhugra and Mastrogianni, 2004), but only a "local" measure of real people's life conditions. Furthermore, epidemiological and biological studies underline the importance of a psychiatric element in explaining consumers' behaviors (Sanfey et al., 2003). In particular, the relationship between money and the brain in decision making has been verified by neuro-economic scientists (Maleeh and Amani, 2012; Pessiglione et al., 2007). The decision of what can be consumed by money should not respond to the calculation of a form of utility, but it should depend on dopamine, a neurotransmitter which works in conjunction to the brain, in regulating movement and emotions. The malfunctioning of the dopamine circuit in the brain is associated with dependence and impulsivity of temperament (Bernheim and Rangel, 2004). Also the level of satisfaction that you receive (or not) in paying taxes should depend on neuronal activity of the striatum.

4 Empirical evidence

Starting from the above considerations, we propose an empirical analysis having as final goal the assessment of whether there exists a relationship between SWB and some of the context variables described in the cited literature. First of all, it is necessary to define a statistical measure of individual levels of discomfort of the population residing in Italian regions. And as pointed out by Antolini (2016), antidepressant expenditure can be used for this purpose. Here, we use data available at a regional level for the years 2007 through 2017 (AIFA 2018). Moreover, the advantage of this indicator resides in the fact that it is an objective measure that is able to represent subjective well-being, conserving the advantages of both qualitative and quantitative indicators (Deiner 2000). At a regional level, an experimental survey was carried out by Istat (2013) for providing a psychological index and it was replicated for the Italian BES dashboard (health dimension). More analytically, comparing this Mental Component Summary Indicator – obtained as the summary of the score registered about the psychological state of individuals over 14 years old – with the antidepressant per capita expenditure at the regional level, the Spearman ranking coefficient (0.2) showed a weak association. This means that in measuring happiness or mental disorders, like depression or other mental illness, different results can be achieved, depending on whether qualitative or quantitative indicators are used.

In the measure proposed by Istat for Italy (Istat, 2018), depression was the most widespread mental disorder, with 2.8 million people who suffered in 2015; on top of that, depression grows with age. Compared to European countries, depression is less widespread in the age range of 15 to 44 years (+1.7% in Italy vs. +5.2% of the European countries - EU28). The prevalence of depression or chronic anxiety is 5.8% in the range of 35 to 64 years, to up to 14.9% for people over 65 years. Among people suffering from illnesses such as depression and severe chronic anxiety, workplace absences are more frequent, thus highlighting a not-casual link from depression to productivity and not vice-versa.

The empirical analysis carried out in this paper involves the use of data on antidepres-

sant expenditures per capita (*Antidep*) as dependent variables as well as the old-age index (*Oldage*), the percentage of health expenditures in direct services on the public social expenditure (*Healthexp*), a NEET rate, and the poverty rates (*Poverty*). The *Oldage* index is the ratio between population over 65 years and population below 14. This index has the aim of investigating whether pharmaceutical antidepressant expenditures are correlated across regions with the ageing of the population, as suggested in the literature and as it occurs in Italy. In Italy, there is less attention paid to specific policies for people's integration into society, in particular for the aged population who tend to be subjected to a state of marginalization and isolation. The expected sign of the correlation with *Antidep* should be positive.

The percentage of Public Health Expenditure in direct services (*Healthexp*) is important because, in Italy, social benefits are mostly monetary benefits, although there are other services of public health that are important for depression, anxiety, and stress. The expected relationship should be negative as more services might reduce the expenditures for antidepressants.

The *Neet* indicator is the percentage of the population in the age range of 15 to 29 years that is not working, studying, or training. The NEET rate is an important social indicator, especially for those countries where it reaches remarkable values. In Italy, it occurs in the southern regions. The association with *Antidep* should be positive, although in some countries the young generations express their mental discomfort through other pathologies such as drug use and lifestyles which lead to obesity (van Reedt Dortland, A.K.B., Vreeburg, S.A.,Giltay, E.J., et. al., 2013). Thus, the sign of the correlation with *Antidep* variable might be controversial.

The poverty rate (*Poverty*) was computed by the percentage of households below the poverty line. Living in a state of poverty is often (but not always) cause of illness and mental diseases of the population (World Health Organization, 2012). *Poverty* should be positively associated with *Antidep*. However, the poverty indicator refers to family conditions and not to individuals experimenting with poverty conditions, so this variable could be not at all consistent with the model. However, since individual data on poverty are not available, this variable has been considered in the model.

GDP is the other variable that should be included in the model (Antolini, 2016). Because of the new system of national accounts (Eurostat, 2010), the regional series of GDP started only in 2013; thus, the model uses employment rate (*Employment*) as GDP proxy, since it is available for the period considered (2007 to 2017). The sign of this variable depends of the quality of the work and the availability of services for helping people in finding a suitable balance between work and daily living.

Figure 1 reports the time plot of all the selected variables. We observed a common pattern of antidepressant expenditures for the 18 regions, with a temporary sharp reduction in 2015. All time plots showed a definite north-south divide. Southern regions were those with a lower social condition as well as a lower antidepressant expenditure per capita. Then, in Italy, social conditions do not seem to be considered as a possible cause determinant of SWB. The cultural aspect is also important in explaining the antidepressant expenditures and in general, knowing depression is a traditional disease. In many cases, including different countries (Lewer et al., 2015), mental illnesses and

disorders are not recognized as health problems, being less evident in respect to other diseases. This is why the consumption of antidepressant expenditures more likely occurs for individuals with a higher level of education.

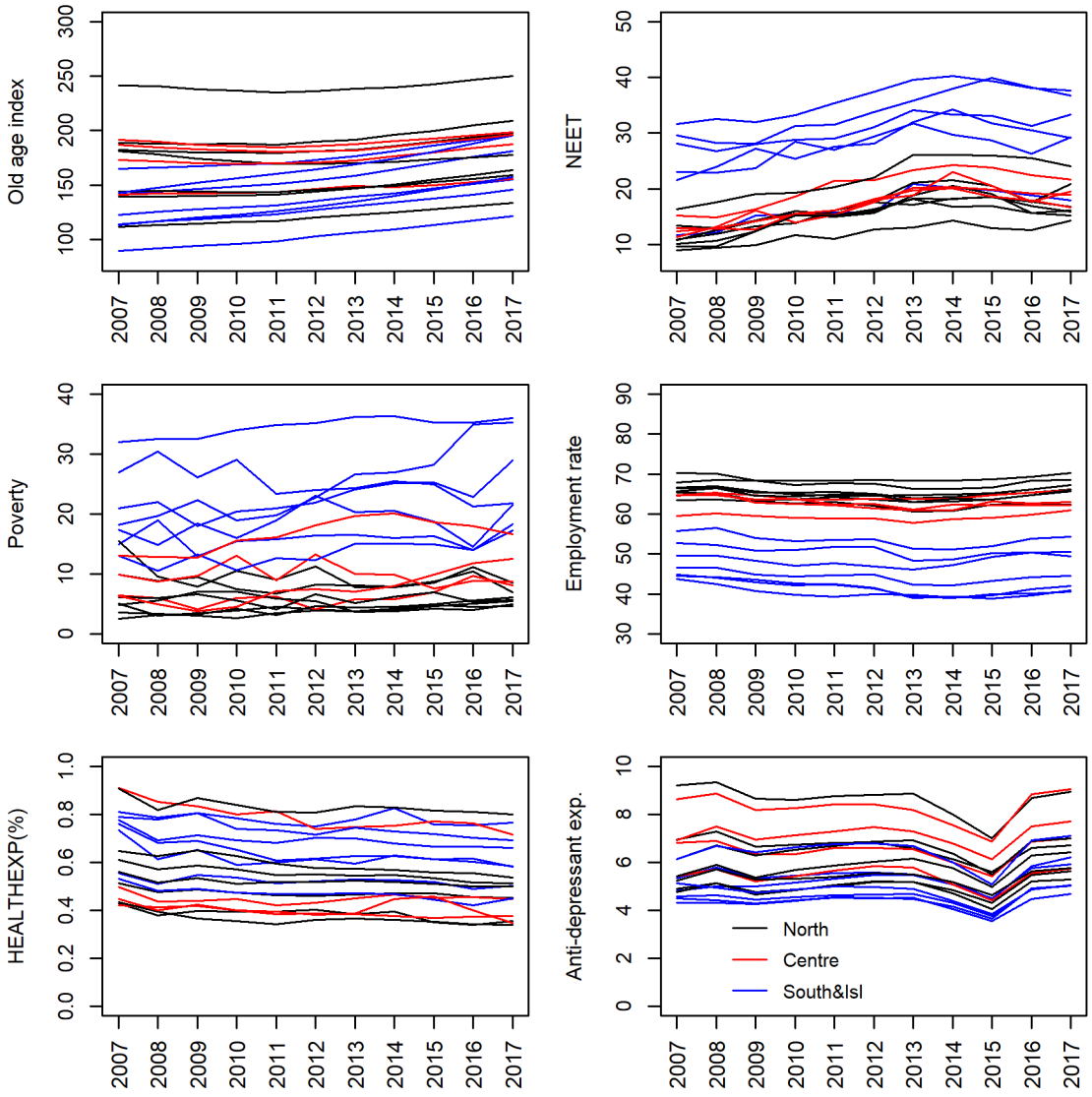

Figure 1: Time pattern of regional variables

As observed in Gualano et al. (2014), the awareness of depression as a noteworthy health issue in the last years has determined the production of new classes of antidepressants that have proved to be more effective. Table 2 shows the correlation matrix for the six variables and suggests which variables can be utilized without incurring the problem

of multicollinearity. We observed high cross-sectional correlations among *Neet*, *Poverty*, and *Employment*, while the within-region correlations were low, denoting a time stability of the variables. The exception was the negative correlation between *Employmen*t and *Neet*.

Table 2: Cross-sectional correlation (plain text; upper triangular matrix) and within region correlation (*italic*; lower triangular matrix)

Variable	Antiexp	Oldage	Neet	Poverty	Employment	Healthexp
Antiexp	1	0.7546	-0.4486	-0.3887	0.5382	-0.5566
Oldage	0.1083	1	-0.4607	-0.4075	0.5063	-0.5164
Neet	*-0.2158*	*-0.5727*	1	0.7656	-0.9240	0.4617
Poverty	*0.0233*	*0.3451*	*0.3510*	1	-0.8713	0.2973
Employment	*0.2536*	*-0.2391*	*-0.7231*	*-0.3041*	1	-0.5008
Healthexp	*-0.1600*	*-0.5729*	*-0.5564*	*-0.3098*	*0.316*	1

The first model (*Model* 1) includes all covariates and a dummy variable ((*Dum*2015) to capture the break in the series that occurred in 2015 (Table 3). The Hausmann test (R function phtest) gave the value 7.2423 for a Chi–square test with 6 degrees of freedom, with a p-value equal to 0.299, indicating a fixed effect model (Verbeek, 2008; Wooldridge, 2002). Table 3 reports the estimates of the fixed effects model with all covariates whereas Table 4 shows the significant covariates under the assumption of within panel heteroskedasticity.

Table 3: Model 1: fixed effect model with all covariates

Variable	Parameter	Std error	t-value	p-value	
Oldage	0.0137	0.0026	5.18	0.000	**
Neet	-0.0223	0.0108	-2.07	0.040	*
Poverty	0.0049	0.0081	0.61	0.541	
Employment	0.0528	0.0207	2.55	0.012	*
Healthexp	-3.1587	-0.6991	-4.52	0.000	**
Dum2015	-1.1333	0.0618	-18.34	0.000	**

* $\leq 5\%$ ** $\leq 1\%$

The non–parametric Wald test for grouped homoskedasticity was significant (Greene,

2000). Therefore, we adapted a model (*Model* 2) which accounted for within-panel heteroskedasticity (Table 4). Specifically, we estimated the fixed effect model with the computation of panel-corrected standard errors (Beck and Katz, 1995). (*Poverty* was not significant and was removed from the model (namely, it was correlated with employment rate).

Table 4: Model 2: fixed effect model with within-panel heteroskedasticity

Variable	Parameter	Std error	t-value	p-value	
Oldage	0.0134	0.0024	5.88	0.000	**
Neet	-0.0223	0.0105	-2.12	0.034	*
Employment	0.0509	0.0186	2.74	0.006	**
Healthexp	-3.1988	0.6107	-5.24	0.000	**
Dum2015	-1.1340	0.0578	-19.63	0.000	**

* $\leq 5\%$ ** $\leq 1\%$

5 Conclusion

The evolution of national accounts as well as all the statistics are not arithmetic problems. Statistical measures need a strong theoretical framework that in the case of National Accounts is the philosophy of growth. Over the years, income has been the main objective of growth, and even its definition has been controversial. The well-being of society (and of individuals) is becoming central to a philosophy of growth in which the first value is having a "sustainable economy". The concept of sustainability is growing and adding to the environment, as well as the mental health of individuals. A society with a high level of individual mental health can be due to the efficient "welfare capitalism" that means an economy is in place that allows people to live without giving up human relationships and where the state and free enterprise are complementary.
Since subjective well-being is a central key to increasing the productivity of firms, it is important to understand with which phenomena it is correlated. The country considered in the present empirical analysis is Italy, but since its differential social conditions were examined at the regional level, the analysis considered this level of statistical units. The measures proposed for evaluating SWB could be subjective or objective; for Italian regions, these did not produce a unique result. For measuring SWB, the antidepressant expenditure amount was considered because it was viewed as "an objective indicator to measure subjective conditions". The southern regions of Italy had a lower level of antidepressant expenditures, due to cultural motivations and because poorer people are correlated with lower levels of education. The econometric panel estimation utilized in

this paper highlights the other noteworthy aspect of the association between antidepressant expenditure and old-age index. The positive sign of the coefficient is a direct consequence of the Italian welfare system. In fact, it is oriented mainly in supplying cash benefits while it does not provide any direct services to avoid, for instance, a loneliness condition that can be considered the main cause of depression. For the other variables, the estimated parameters seemed to be consistent with the theory. The poverty index was not statistically significant, because its measure was referring to the family and not to individuals. It was also negatively correlated with employment rate.
The final model is a fixed effect panel model corrected by heteroskedasticity. The empirical evidence showed a negative effect of the *Neet* indicator and expenditure on health. Particularly important was the coefficient of expenditures that, due to the lack of direct services in Italian regions, can have a negative effect on depression. It was also consistent with the sign of the old age index because in Italy the people with depression are mainly elderly. It is interesting to point out the positive association with employment rate, that likely is due to the fact that in many Italian regions, it is not easy to have a good balance between working life and daily living time. Also, in this case, the existence of an excellent level of services – in particular for the women, who have an important role in the education of children – is indirectly confirmed.

References

Adler, N., Boyce, T., Chesney, M., S., C., S., F., R., K., and S., S. (1994). Socioeconomic status and health. *American Psychologist*, 49(1):15—24.

Andrews, F. and Withey, S. (2012). *Social Indicators of Well-Being: Americans' Perceptions of Life Quality*. Springer.

Antal, M. and Bergh, J. (2014). *Evaluating alternatives to GDP as measures of social welfare/progress*. Working Paper n. 56, March 2014, ECONSTOR.

Antolini, F. (2013). *Nuovi itinerari di sviluppo locale*. Edizione Homeless Book, Bologna.

Antolini, F. (2016). The evolution of national accounting and new statistical information: Happiness and gross domestic product, can we measure it? *Social indicator Research*, 129(3):1075–1092. DOI: 10.1007/s11205–015–1156–6.

Antolini, F. and Boccella, N. (2006). *Sentieri di crescita e cluster di imprese*. Rome, Liguori Editore.

Antolini, F. and Simonetti, B. (2018). The easterlin paradox in italy, or the paradox in measuring? define happiness before investigating it. *Social Indicators Research*, 146(3):1–23. DOI: 10.1007/s11205–018–1890–7.

Assessment, M. E. (2005). *Ecosystems And Human Well-Being: Wetlands And Waters Synthesis*. World Resources Institute, Washington, DC. MEA Report. www.millenniumassessment.org/documents/document.358.aspx.pdf (accessed November 2019).

Baddeley, M. (2013). *Bad habits, beavhioural Economics and finance*. London, Routledge.

Becattini, G. (2004). *Industrial districts: a new approach to industrial change*. Edward Elgar, Cheltenham.

Beck, N. and Katz, J. (1995). What to do (and not to do) with times-series–cross-section data in comparative politics. *American Political Science Review*, 89(3):634–647.

Bernheim, B. and Rangel, A. (2004). Addiction and cue-triggered decision processes. *American Economic Review*, 94(5):1558–1590.

Bhugra, D. and Mastrogianni, A. (2004). Globalization and mental disorder. *British Journal of psychiatry*, 184:10–20. DOI: 10.1192/bjp.184.1.10.

Blanchflower, D. and Oswald, A. (2008). Hypertension and happiness across nations. *Journal of Health Economics*, 27:218–233. DOI:10.1016/j.jhealeco.2007.06.002.

Boarini, R., Johansson, A. and Mira d'Ercole, M. (2006). Alternative measures of well-being. *Statistics in Brief*.

Bos, F. (2017). Uses of national accounts from the 17th century till present and three suggestions for the future. *Eurostat Review on National Accounts and macroeconomic indicators – EURONA*, 2017(1).

Breslau, J., Kendler, K. S., Su, M., Gaxiola-Aguilar, S., and Kessler, R. C. (2005). Lifetime risk and persistence of psychiatric disorders across ethnic groups in the united states. *Psychological medicine*, 35(3):317–327. DOI: 10.1017/s0033291704003514.

Brooks, A. (2010). *The Battle of Happiness. How the fight between free enterprise and big government will shape American future*. President, American Enterprise institute.

Brooks, J. (2013). Avoiding the limits to growth: Gross national happiness in bhutan as a model for sustainable development. *Sustainability*, 5(9):3640–3664.

Carpenter, M. (2000). It is a small world: mental health policy under welfare capitalism since 1945. *Sociology of Health and Illness*, 22:602–620. DOI:10.1111/1467–9566.00222.

Comin, F. (2001). Richard stone and measurement criteria for national accounts. *History of Political Economy*, 33(Suppl. 1):2013–234. 10.1215/00182702–33.

Corrado, C., Haskel, J., Iommi, M., Lasinio, C., Mas, M., and M., O. (2017). Advancements in measuring intangibles for european economies. *Eurona*, pages 89–106.

Costanza, R., Hart, M., Talberth, J., and Posner, S. (2009). Beyond gdp the need for new measures of progress. *The Pardee Papers*, 4.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, 55(1):34–43. DOI: 10.1037/0003–066X.55.1.34.

Diener, E. (2006). Guidelines for national indicators of subjective well-being and ill-being. *Applied Research in Quality of Life*, 1(2):151—157.DOI 10.1007/s11482–006–9007–x.

Diener, E., Lucas, R. E., and Oishi, S. (2009). *Subjective Well-Being. The Science of Happiness and Life Satisfaction*. Oxford University Press, DOI: 10.1093/oxfordhb/9780195187243.013.0017.

Diener, E., Oishi, S., and Lucas, R. (2015). National accounts of subjective well-being. *American Psychological Association)*, 70(3):234–242.DOI: 10.1037/a0038899.

Diener, E. and Seligman, M. (2004). Beyond money toward an economy of well-

being. *Psychological Science in the Public Interest*, 5(1):1–31. DOI: 10.1111/j.0963–7214.2004.00501001.x.

Diener, E. and Tov, W. (2012). *National Accounts of well-being*. New York, Springer.

Elster, J. (1998). Emotions and economic theory. *Journal of Economic literature*, 36(1):47–74.

Eurostat (1995). *ESA: European System of Accounts*. Eurostat.

Eurostat (2010). *ESA: European System of Accounts*. Eurostat.

Greene, W. (2000). *Econometric Analysis*. 4th Edition, Prentice Hall, Englewood Cliffs.

Gualano, M., Bert, F., Mannocci, A., La Torre, G., Zeppegno, P., and Siquilini, R. (2014). Consumption of antidepressants in italy: recent trends and their significance for public health. *Psychiatric Service*, page DOI: 10.1176/appi.ps.201300510 https://ps.psychiatryonline.org/doi/full/10.1176/appi.ps.201300510.

Helliwell, J. and Putnam, R. (2004). The social context of well–being. philosophical transactions of the royal society. *Biological Sciences, Series B*, 359:1445–1446. DOI: 10.1098/rstb.2004.1522.

Helliwell, J. F., Barrington-Leigh, C. P., Harris, A., and Huang, H. (2009). International evidence on the social context of well-being. *NBER Working Papers*, 14720.

Hidaka, B. H. (2012). Depression as a disease of modernity: Explanations for increasing prevalence. *Journal of Affective Disorders*, 140(3):205–14.DOI: 10.1016/j.jad.2011.12.036.

Hill, P. (2014). Intangibles and service in economic accounts. *EURONA*, 1:59–72. https://ec.europa.eu/eurostat/cros/system/files/p3-intangibles_and_services_in_economic_accounts.pdf (accessed November 2019).

Holloway, I. and L., T. (2003). The status of method: Flexibility, consistency and coherence. *Qualitative Research*, 3:345–357. DOI: 10.1177/1468794103033004.

Hone, L., Jarden, A.and Schofield, G., Schofield, and Duncan, S. (2014). Measuring flourishing: The impact of operational definitions on the prevalence of high levels of wellbeing. *International Journal of Wellbeing*, 4:62–90. DOI:10.5502/ijw.v4i1.4.

Istat (2013). *Benessere Equo e sostenibile*. Istat, Roma.

Istat (2018). *La salute mentale nelle varie fasi della vita*. Istat, Rome. www.istat.it/it/files/2018/07/Report_Salute_mentale.pdf (accessed November, 2019).

Jorgenson, D. and Slesnick, D. (2014). Measuring social welfare in the national accounts. *Eurona*, 1:39–58.

Kenneth, C., Michalos, C., and Sirgy, J. (2012). *Handbook of Social Indicators and Quality of Life Research*. Springer. Netherlands.

Kessler, R. C., Angermeyer, M., Anthony, J. C., De Graff, R., Demyttenaere, K., and I., G. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the world health organi-zation's world mental health survey initiative. *World Psychiatry*, 6:168—-176.

Kim-Prieto, C., Diener, M., Tamir, M., Scollon, C., and Diener, M. (2005). Integrating the diverse definitions of happiness: A time-sequential framework of subjective well-

being. *Journal of Happiness Studies*, 6:261—300. DOI: 10.1007/s10902–005–7226–8.

Klerman, G. L. and Weissman, M. M. (1989). Increasing rates of depression. *The Journal of the American Medical Association*, 15:2229—2235.

Kuznets, S. (1934). *National Income, 1929–1932.Senate document*, volume n. 124. 73d Congress, 2d session.

Kuznets, S. (1948a). *National Income, 1929–1932.Senate document*, volume n. 49. NBER Bulletin.

Kuznets, S. (1948b). National income: a new version (discussion of the new department of commerce income series). *The Review of Economics and Statistics*, 3:151–179.

Latouche, S. (2008). *Breve trattato sulla decrescita serena.* Milano: Bollati Boringhieri.

Latouche, S. (2011). *Per un'abbondanza frugale, Malintesi e controversie sulla decrescita.* Milano, Bollati Boringhieri.

Layard, R. (2012). *Mental health: The new frontier for the welfare state, Centre for Economic Performance.* 21st Birthday Lecture Series. http://eprints.lse.ac.uk/47418/ (accessed November 2019).

Lee, L., Amir, O., and Ariely, D. (2009). In search of homo economicus: Cognitive noise and role of emotion in preference consistency. *Journal of Consumer Research*, 2:173–187. DOI: 10.1086/597160.

Lequiller, F. and Blades, D. (2014). *Understanding National Accounts: Second Edition.* OECD Publishing, Paris. https://doi.org/10.1787/9789264214637-en (accessed November 2019).

Lewer, D.and O'Reilly, C., Mojtabai, R., and Evans-Lacko, S. (2015). Antidepressant use in 27 european countries: Associations with sociodemographic, cultural and economic factors. *British Journal of Psychiatry*, 3:221–226. DOI:10.1192/bjp.bp.114.156786.

Maddison, A. (2005). Measuring and interpreting world economic performance 1500–2011. *Review of Income and Wealth*, 51(1):1–35. DOI: 10.1111/j.1475–4991.2005.00143.x.

Maddison, A. (2007). *Contours of the world economy 1–2030 AD: essays in macro-economic history.* Oxford University Press.

Maleeh, R. and Amani, P. (2012). Bohm's theory of the relationship of mind and matter revisited. *Neuroquantology*, 10(2):150–163. DOI: 10.14704/nq.2012.10.2.536.

Manderson, L. H. (1948). *The social context of wellbeing*, pages 1–26. Perth, Network Books.

Mellander, C., Florida, R., and Stolarick, K. (2011). Here to stay—-the effects of community satisfaction on the decision to stay. *Spatial Economic Analysis*, 6(1):5–24. DOI: 10.1080/17421772.2010.540031.

Mitra-Khan, H. (2007). *Understanding National Accounting in Hindsight.* Proceedings of the History of Economics Society Annual Conference. History of Economics Society, Washington.

Moss, M. (1973). *The Measurement of Economic and Social Performance.* NBER Columbia University Press. www.nber.org/chapters/c3612.pdf (accessed November

2019).

Muraca, B. (2012). Towards a fair degrowth-society: Justice and the right to a "good life" beyond growth. *Futures*, 44(6):535–545. DOI: 10.1016/j.futures.2012.03.014.

NEF (2019). Nef: Happy planet index. a global index of sustainable well-being. http://happyplanetindex.org/about-nef/.

OECD (2007). *Istanbul declaration in measuring and fostering the progress of societies*. OECD, Istanbul. https://www.oecd.org/site/worldforum06/istanbulworldforum-measuringandfosteringtheprogressofsocieties.htm (accessed November 2019).

OECD (2008). *Handbook on Constructing Composite Indicators. Methodoly and user giude*. OECD-JRS, Paris. https://www.oecd.org/sdd/42495745.pdf (accessed November 2019).

OECD (2017). *How is life? Measuring well-being*. OECD. ISSN: 23089679 (online) https://doi.org/10.1787/23089679. http://www.oecdbetterlifeindex.org/.

Oswald, A. and Wu, S. (2010). Objective confirmation of subjective measures of human well-being: evidence from the u.s.a. *Science*, 327(5965):576–579. DOI: 10.1126/science.1180606.

Oswald, A. J. (1997). Happiness and economic performances. *Economic Journal*, 107(445):1815—-1831.

Pessiglione, M., Schmidt, L., Draganski, B., Kalisch, R., Lau, H., Dolan, R., and Frith, C. (2007). How the brain translates money into force: a neuroimaging study of subliminal motivation. *Science*, 316(5826):904–6. DOI: 10.1126/science.1140459.

Platt, S., Stace, S., and Morrissey, J. (2017). *Dying From Inequality: Socioeconomic Disatvantage and Suicidal Behaviour*. The Samaritans. media.samaritans.org/documents/Samaritans_Dying_from_inequality_report_-_summary.pdf.

Przeworski, A., Alvarez, M., Cheibub, J., and Limongi, F. (2000). *Democracy and Development: Political Institutions and Well-Being in the World, 1950–1990*. Frontmatter Cambridge: Cambridge University Press.

Rajagopal, P.and Rha, J. (2009). The mental accounting of time. *Journal of Economic psychology*, 30:772–781. DOI: 10.1016/j.joep.2009.06.008.

Ribeiro, L. and Marinho, E. (2016). Gross national happiness in brazil: An analysis of its determinants. *EconomiA*, 18(2):156–167. DOI: 10.1016/j.econ.2016.07.002.

Sanfey, A., Rilling, J., Aronson, J., Nystrom, L., and Cohen, J. (2003). The neural basis ec economic decision-making in the ultimatum game. *Science*, 300(5626):1755–1758. DOI: 10.1126/science.1082976.

Saraf, P., Rahman, T., Gallardo, M., Jamison, J., and C., L. (2018). *Improving Mental Well-being and productivity of small-medium Entrepreneurs in Fragile, Conflict and Violence Affected Areas. Can Cognitive behavioral Therapy trainings Help?* Policy Research Working paper, World Bank. N. 8489.

Schwarz, N. and Strack, F. (1991). Context effects in attitude surveys: Applying cognitive theory to social research. *European review of social psychology*, 2(1):31–50. DOI:

10.1080/14792779143000015.

Selye, H. (1974). *Stress without distress.* Philadelphia, Lippincott Co.

Social Imperative Foundation (2018). *Social Progress Index.* United States. https://www.socialprogress.org/.

Stiglitz, J., Sen, A., and Fitoussi, J. (2010). *Report on commission on the measurement of economic performance and social progress.* Paris.

Stone, R., Champernowne, D., and Meade, J. (1942). The precision of national accounts estimates. *Review of Economic Studies*, 9(2):111—125.

Strack, F., Argyle, M., and N, S., editors (1991). *The psychological causes of happiness*, pages 77—-101. Cambridge: Oxford University Press.

Studensky, P. (1958). *The Income of Nations. Theory, measurement and Analysis: Past and Present: A study in Applied Economics and Statistics.* New York, University Press.

Thaler, R. (2018). *Misbehaving. La nascita dell'economia comportamentale.* trad. Giuseppe Barile. Einaudi ed.

Thaler, R. and Sunstein, C. (2008). *Nudge — Improving decisions about Health, Wealth and Happiness.* New Haven, CT. YALE University Press.

United Nations (1947). *Measurement of National Income and the construction of social accounts, in Studies and Reports on Statistical Methods N.7.* UN,New York.

United Nations (1968). *SNA: System of National Accounts.* UN, New York.

United Nations (1993). *SNA: System of National Accounts.* UN, New York.

United Nations (2018). *A statistical informations system for capturing well-being and sustainability.* 12th Meeting of the Advisory Expert Group on National Accounts, 27-29 November 2018, Luxemburg. SNA/M1.18/4.c.

Van de Ven, P. (2019). *Measuring economic well-being and sustainability: a practical agenda for the present and the future.* EURONA, 1/2019.

van Reedt Dortland, A.K.B., Vreeburg, S.A.,Giltay, E.J., et. al. (2013). The impact of stress systems and lifestyle on dyslipidemia and obesity in anxiety and depression. *Psychoneuroendocrinology*, 38(2):209–218. DOI: 10.1016/j.psyneuen.2012.05.017.

Veenhoven, R. (1991). *Question of happiness, Classical topics, modern answers.* Pergamon Press.

Veenhoven, R. (1996). *The study of life–satisfaction.* Eötös University Press. Retrieved from http://hdl.handle.net/1765/16311.

Veenhoven, R. (2012a). Cross-national differences in happiness: Cultural measurement bias or effect of culture? *International Journal of Wellbeing*, 2(4):333–353. DOI:10.5502/ijw.v2.i4.4.

Veenhoven, R. (2012b). *Happiness: Also known as life satisfaction and subjective well-being*, pages 63–77. Springer, Dordrecht.

Verbeek, M. (2008). *The econometrics of panel data.* Springer.

Wittchen, H., Knäuper, B., and Kessler, R. (1994). Lifetime risk of depression. *The*

British Journal of Psychiatry, 165(S26):16–22.

Wooldridge, M. J. (2002). *Econometric Analysis of Cross-Section and Panel data*. The MIT Press, Cambridge, Massachusetts.

World Health Organization (1948). *Official records of the World Health Organization. No. 2. In: Proceedings and final acts of the international health conference*. United Nations: WHO Interim Commission.

World Health Organization (2012). *Risk to mental Health: An overview of vulnerabilities and risk factors*. WHO. www.who.int/mental_health/mhgap/risks_to_mental_health_EN_27_08_12.pdf (accessed November 2019).

Xumei, H. (2015). On development of china's system of national accounts and suggestions for improvement. *Journal of Statistical Science and Application*, 3:203–208. DOI: 10.17265/2328–224X/2015.1112.003.

Yilmaz, O. (2017). International welfare comparison using gdp and better life index parameters. *Journal of Economics Finance and Accounting*, 4(1):1–14. pressacademia.org/archives/jefa/v4/i1/1.pdf (accessed April 2020).

Zalensky, J. M., Murphy, S. A., and Jenkins, D. A. (2008). Happy–productive workers thesis revisited. *Journal of Happiness Study*, 9(4):521–537. DOI: 10.1007/s10902–008–9087–4.