Measuring Progress of italian regions: a Classical Approach

El objetivo del trabajo es establecer una definición de «progreso» de las regiones italianas basado en la relación entre desarrollo económico y civil, de acuerdo a los autores clásicos, en el contexto. En primer lugar, se analiza la interacción entre el desarrollo económico y el civil, en una causalidad circular acumulativa, y las relaciones de distinta naturaleza entre estos dos elementos. En segundo lugar, proponemos un índice sintético de progreso, que tiene en cuenta los diferentes componentes de desarrollo (social, civil, económico y ecológico) así como el concepto de «sostenibilidad social» del progreso, definido como la mejora equilibrada de todas sus dimensiones.

Lanaren helburua «aurrerapenaren» definizioa ezartzea da, garapen ekonomikoaren eta garapen zibilaren arteko harremanean oinarrituta, egile klasikoekin bat etorrita, Italiako eskualdeen testuinguruan. Lehenengo eta behin garapen ekonomikoaren eta garapen zibilaren arteko interakzioa aztertzen da, kausalitate zirkular metatu batean, bai eta elementu bi horien arteko kausalitate-harreman ezberdinak ere. Bigarrenik, aurrerapenaren indize sintetiko bat proposatu dugu. Horrek, alde batetik, garapenaren osagai ezberdinak hartzen ditu kontuan (soziala, zibila, ekonomikoa eta ekologikoa) eta, beste alde batetik, aurrerapenaren «iraunkortasun soziala» hartzen du oinarri, dimentsio guztien hobekuntza orekatua dela.

The purpose of the paper is to apply a definition of 'progress' of the Italian regions based on the relationship between economic development and civil development, according to the lesson of Classical authors. Firstly, we analyze the interaction between economic development and civil development, in a circular cumulative causation, and the relationship of different nature between these two elements. Secondly, we propose a synthetic index of progress, which on the one hand takes account of the different components of development (social, civil, economic and ecological) and on the other hand is based on the concept of 'social sustainability' of progress, defined as balanced improvement of all its dimensions.

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> «It is vital for an economist to be acutely conscious of the responsibility to study society for the sake of promoting progress —the economic, social and civil progress of society— and not for personal interest».
>
> *(Paolo Sylos Labini)*

1. **INTRODUCTION**

Progress is a multidimensional concept, thus deciding on some universal criteria for measuring it is indeed difficult. However, it is impossible to deny that progress is the logical consequence of generalised human activities, thus until and unless we recognise the central role of human beings in making progress in a society we cannot reach a proper understanding of its nature.

The purpose of our paper is to propose a definition of 'progress' based on the relationship between economic development and civil development, according to the lesson of Classical authors, especially Adam Smith.

In referring to Smith we take into account his three fundamental works, «The Theory of Moral Sentiments», 'The Wealth of Nations' and «Lectures on Jurisprudence». However, the Smithian lesson is drawn —for sake of simplicity— from the economic thought of Paolo Sylos Labini (PSL) to which we largely refer in the first

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part of the paper. Economic development and civil development interact over time in a circular way, with different cumulative causal relations: economic development can enhance civil development by the decrease of poverty, the increase of social infrastructure, the competition that improves the efficiency of the production system, and the improvement of the quality of work. While civil development can increase economic development through three factors: culture, institutions (above all the market) and ethics (see graph 1).

Graph 1.   **CAUSAL RELATIONS BETWEEN ECONOMIC DEVELOPMENT AND CIVIL DEVELOPMENT**
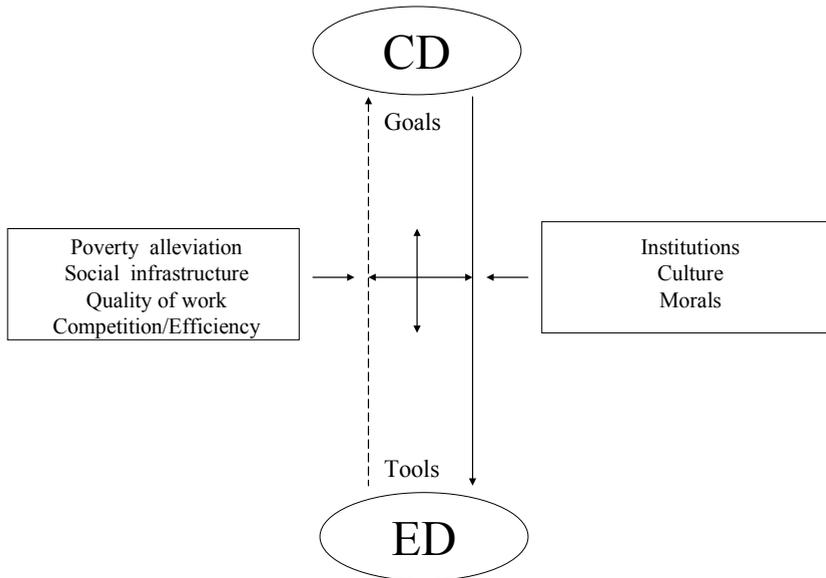
Sources: Own elaboration.

According to the Smithian approach, this interaction is neither mechanical nor guaranteed, nor equal nor continuous in time and space: economic and civil development are included in social processes and phenomena that by their nature are complex and historically determined. Some specific issues such as unemployment, research, tax evasion, poverty, population explosion in poor countries are analysed, taking into account the close connection between economic and civil development. In addition, there are moral, social and environmental limits to the positive influence of economic development on civil development. In reference to these limits, in the economically advanced stage, as that of Western countries, the main factor for civil development is not the amount of income generated, but the way in which income is produced; therefore, in certain circumstances, economic development could even be negative for civil development.

We analyse the following aspects: the interaction between economic development and civil development, in a circular cumulative causation, and the various causal relationships between these two elements. We then propose a synthetic index of progress, which on the one hand takes account of the different components of development (social, civil, economic and ecological) and on the other hand is based on the concept of «sustainability» of progress, defined as balanced improvement of all its dimensions.

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2. CUMULATIVE CYCLE BETWEEN ECONOMIC AND CIVIL DEVELOPMENT

The idea that the economic system and social system are integrated and that the goal of economic analysis is to study the links among social and economic variables has characterised development studies. Let us mention some relevant contributions to show how the Classical approach, that we adopt in this paper, can be related to the rest of development literature.

Seers underlines that to evaluate the progress of a country is not opportune to concentrate only on economic growth. For example, he writes: «What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have become less severe, then beyond doubt this has been a period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three have, it would be strange to call the result "development", even if per capita income has soared» (Seers 1969, pp. 3-4).

At the same time, Frey and Stutzer argue that economic variables should be means for happiness and well being: «[...] economics is —or should be— about individual happiness; in particular, how do economic growth, unemployment and inflation, and institutional factors such as governance affect individual weel-being?» (Frey Stutzer, 2002, p.402).

Layard emphases that the relationship between purely economic progress and happiness is very complex: «GDP is a hopeless measure of welfare. For since the War that measure has shot up by leaps and bounds, while the happiness of the population has stagnated» (Layard, 2002, p.3).

The Washington Consensus's policies, based on liberalisation, privatisation and stabilisation, translate in political terms the dominance of purely economic progress in mainstream theory. But in the 1980s and 1990s, the social impact of these policies was very negative: «[...] in view of the widespread increase in inequality observed during the last twenty years —and of its negative impact on growth, poverty, inequality and social stability— adjustment and development policies must be more attentive to their distributive impact. In this and other areas it is necessary to explore

alternative adjustment and development trajectories involving different impacts on income distribution» (Cornia, 1999, p.4).

The interaction among economic development and civil development happens also because economic development needs continuous structural change lead by institutions: «Any economy is a dynamic entity which changes its structures and features as development takes place. Indeed, a continuous transformation of the economic structure is key ingredient behind sustained growth and development. [...] structural change is the ability of an economy to constantly generate new dynamic activities» (Ocampo, 2005).

Civil development, as the improvement of an inclusive social mechanism, can generate new opportunities for economic progress: «Many people —the excluded— have had little or no opportunity even to think about the strategy for their economic development, let alone to use their imagination in contributing to its determination. Theirs is therefore an untapped and unused potential […]. Although it is not certain exactly what options the unleashing of peoples' imagination might deliver for economic development processes, it is clear that the welfare concerns from retaining the constraints again include both distributional and efficiency effects. For example, to remain deliberately blind to those as yet uncovered options is seemingly destined to disallow opportunities for […] efficient improvements, at least on some occasions». (Sugden and Wilson 2005, pp. 19-20).

Also Amartya Sen, with his capability approach where goods and services are instruments to enable individual «to be» and «to do», focuses on relationship across development's dimensions and also affirms that development «can be seen […] as a process of expanding the real freedoms that people enjoy» (Sen, 1999, p. 1).

Finally acknowledgement of integration of social and economic factors, stimulates academic and institutional debate on the measurement of well being where the GDP represents only one of the most relevant variables and not the only one: «the time is ripe for our measurement system to shift emphasis from measuring economic production to measuring people's well-being. And measures of well-being should be put in a context of sustainability. Despite deficiencies in our measures of production, we know much more about them than about well-being. Changing emphasis does not mean dismissing GDP and production measures. They emerged from concerns about market production and employment; they continue to provide answers to many important questions such as monitoring economic activity. But emphasising well-being is important because there appears to be an increasing gap between the information contained in aggregate GDP data and what counts for common people's well-being» (Stiglitz, Sen and Fitoussi 2009, p.12). The interconnection between economic progress and social progress is also a critical element of the effect of globalisation: [...]some of the most important, and adverse effects, relate to how globalization affects the political and social "equilibrium", in ways which may not always be positive for long-term growth». (Stiglitz, 2003 p.513).

In our view, the first logical step when considering the relationship between two factors is to define their characteristics. We conceive economic development according to the Classical approach as a process of continual structural change which brings about an increase in individual earnings which from Smith on is considered the index of material wealth. It is difficult to give a precise definition of civil development beyond what intuition and common sense tells us; multiple criteria must be used for its evaluation in the context of a complex situation.

«To evaluate civil development [*as opposed to economic development*, editors note], there is no single nor can there be a single criteria. However, if it is true that the process of democratization is spreading throughout the world it is valid to refer to concepts which are part of this process. Various criteria can be gleaned from these concepts, some quantifiable and others only measurable in conventional often arbitrary terms. These quantifiable criteria will allow us to measure the level of education for each age class, the unemployment rate, the employment rate and type, the level of inequality of wage distribution, the infant mortality rate, average life expectancy and incidence of juvenile delinquency. Among the criteria which can only be measured in conventional terms and can only be defined and described through qualitative analyses we can include: civil rights —which include judicial guarantees—, freedom of the press and of opinion, the right of association and political freedoms in general». (PSL, 1989: p. 685).

It is essential to consider the relationship between economic development (ED) and civil development (CD) in terms of circularity: there is bi-directional interaction between the two phenomena which evolves with time and in which both factors can be cause and/or effect in relation to the other factor. The economist's task is to unravel these complex ties.

«Common convention says that economic development automatically brings with it civil development as if there were a cause and effect relationship between the two processes. It is clear that people who can barely afford the essentials have a limited chance to improve in non-economic areas; and it is certain that to build the infrastructure necessary to civilize a country an ever increasing supply of resources is needed. But if this is a necessary condition, it is not a sufficient one. On the other hand, if certain fundamental requisites in the area of civil development are not present, for example a minimum level of education, economic development is not possible. The truth is that it is most efficacious to reason in terms of interaction rather than cause and effect». (PSL, 1992: p. 398).

The circularity which can be described is not continuous; there is the possibility of temporal misalignments, effects that are retarded or accelerated and it is not proportional seeing as there can be significant differences between the causal dimension and the effected dimension.

2.1. **From civil to economic development**

According to a Classical approach, civil development has a positive influence on economic development through three channels: institutions, culture and morals.

Institutions

The institution which is fundamental for economic development is the market, not taken as a natural institute, but as one that is historically determined and which changes with time to be more or less significant.

The market is therefore an institution created by institutions which express the norms which define the limits of economic action and its potential. The *laissez faire* vision, that is a condition of absolute freedom of action of economic entities is dangerous and not only because of effects tied to social equality but also and most importantly for long term economic development. Economic forces if left completely alone would bring about their self-destruction.

The institutions which sustain economic development are exactly those capitalistic ones which are tied to economic freedom («corporate structures, ownership regimes») and those not strictly capitalistic («educational and research systems»).[1]

Finally, public institutions have an important role in economic development. Public intervention can be divided into military, social, antagonistic («which impose behavior on corporations which they would not otherwise adopt») and cooperative («which support corporations and help them directly or indirectly»).[2] The last type can be in the financial, organizational and structural areas and they sustain activities which would not otherwise have been started.

Culture

The second channel through which civil development can contribute positively to economic development is represented by culture. In the first place in its most basic manifestation: education. We can distingush two types of culture, humanistic and scientific. The second has the greatest impact on technical progress and therefore on economic development and it is in this area that economically less developed countries, for example African countries, are deficient.

«It has been said: there are two cultures, humanistic and scientific; if we accept that social sciences are autonomous, then there are three types of culture. Humanistic culture includes literature, poetry, music, painting and the other arts; scientific culture is founded on experiments and necessitates laboratories, special instruments and various support structures which require significant economic development». (PSL, 2000: p.35)

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[1] Sylos Labini (2000), p. 171.

[2] Sylos Labini (2004), p. 83.

Morals

The third channel is morals. Smith does not see contraposition between the ethical and economic spheres; ethical behavior helps economic development.

«Smith represents a turning point with respect to previous tradition which was essentially built by mercantilists and counselors to the prince. The preoccupation of these counselors was the power of nations (…) but Smith took personal wellbeing as the essential reference point and principal object of study. (..) But the growth of individual income is an objective to be seen not as an end in itself but as an instrument for civil development. (..) And civil development can be obtained by following the moral and judicial rules which Smith had already outlined in the *Theory of moral sentiments,* which he then proposed in various ways in his works on the economy». (PSL, 2002: pp.4-5).

Corruption is an example of how moving away from morally accepted behavior is inauspicious and is socially and economically unsustainable.

«Corruption includes tax evasion and "bribes" for public works which take resources from the revenue authorities; it lowers confidence in contracts and lowers self-confidence which is the source of non-rhetorical and non-hypocritical patriotism. In these ways, corruption slows economic development and inhibits the convergence between economic and civil development». (PSL, 2000: p.111).

2.2. From economic to civil development

Economic development can sustain civil development through two important channels: the fight against unemployment and encouraging research.

The fight against unemployment

As the father of contemporary theory of economic development ––Arthur Lewis–– Sylos Labini focuses on the way to eliminate unemployment. As is known, Lewis points out that the labour market mechanism through which the transfer from the traditional sector to the capitalistic sectors occurs in developing countries, is characterized by dual economy. At the same time, Sylos Labini underlines the social consequences of unemployment.

Unemployment means exclusion from the social life and a frustrating dependence on others. The alienated state of the unemployed increases the probability that they will engage in illicit activities with even graver consequences for society as a whole.

«Youth unemployment is a problem common to all of the main European nations —not even Western Germany is excluded; but it is particularly significant for us: remember that unemployment is becoming more and more a problem of the South. As a consequence, in many areas of the South, among the younger genera-

tions, frustration and pessimism, foreboding but not impossible to overcome, but of dark inertia and widespread deviant behavior as they say, is growing. It is not therefore only a problem of economic development: it is a problem of civil growth of the entire nation». (PSL, 1985: p.1).

Research

Sylos Labini, as scholar of Schumpeter,[3] follows the Schumpeterian lesson according to which research is the driver of technical progress —and therefore of economic development— by generating different types of innovation: organisational innovation, product innovation, market innovation, process innovation, and input innovation (see Schumpeter, 1934). Sylso Labini studies its important repercussions on civil development. Research contributes to the improvement of culture through increasing knowledge; it improves the quality of life by on the one hand attenuating the negative impact of economic development which will be discussed later, and on the other by improving the quality of work.

Finally, research is always accompanied by civil liberties. Research is relevant not only for economic but also for civil development which is far more important than economic development for various reasons. First off, research is the result of cultural growth and at the same time it feeds cultural growth creating practical challenges which are translated into intellectual challenges. For the most part, common practice shows that freedom to do research is essential for the diffusion of research itself and that freedom to do research is not separable from political freedom and democracy.

2.3. **Limits on economic development**

The Classical view is very optimistic regarding the importance of economic development in civil development but realistically, there are some limits to economic development which are chiefly environmental and social.

We can distinguish two phases in economic development. In the first phase, through production and distribution of primary goods and investment in primary infrastructure, the quality of life is improved and socially relevant diseases are reduced (in this phase these are infective diseases, respiratory diseases and diseases of the digestive tract). In the second phase, economic growth brings about the generation of diseases which are accompanied by the increase in consumption of tobacco, alcohol and drugs.

«Smoking and alcohol, like drugs, have limited and indirect connections to economic factors. Maybe the connection is that the process of development, above certain levels, increases the number of people subject to *stress* and various kinds of frustrations among which a sense of emptiness and frustration which comes from

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[3] For the relationship between Sylos Labini and Schumpeter see Corsi (2006).

overcoming basic economic problems. All this tension and frustration, which clearly falls into the psychological area, represents an incentive to consume, and to use tobacco, alcohol and drugs. This represents, at least for a certain period, a direct non-inverse correlation between the diseases connected to so called risk factors and economic development». (PSL, 1990: p. 314).

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These sorts of phases are not strictly defined because diseases are exported to economies in much earlier stages of development due to globalization.

Another issue is linked with the environment. Even here there are two phases in development.

During the phase of underdevelopment, desertification and deforestation are the indirect consequences of misery while in the development phase there are problems linked with pollution from economic growth. Obviously as Sylos Labini notes, even in developing nations there are problems linked with pollution but certainly these are not as severe in the wealthy nations: in the globalised world, in fact, there is a considerable exporting of pollution, e.g. under trading agreements. As we have seen, even in this case there seems to be a first phase to economic development which is markedly positive while later the negative effects become more significant.

We can talk of an increase in the return on economic development in terms of human development up to a certain point after which returns tend to decrease in the sense that the role that income has is always less important in terms of quantity produced while the way we produce that income becomes fundamental. Qualitative aspects become increasingly important in economic growth.

«Development is a socially fundamental objective until individual income of the majority of the population reaches a certain critical level. After people are generally are able to satisfy their essential needs and obtain a certain amount of comfort, economic development becomes less important and consumerism tends to become widespread and takes on pathological dimensions (…) and the river of frivolous goods grows rapidly even to dangerous levels. For "developed countries" —about one fifth of humanity —development is no longer important in terms of the availability of goods. One shouldn't forget that in the course of development, many traditional values are destroyed and profound changes in life styles and systems of thought come about: the uninterrupted process of adaptation cannot move forward without much suffering». (PSL, 2000a: p.142).

3. **EMPIRICAL ANALYSIS**

Having described the concept of progress in terms of a cumulative circle between economic development and civil development, in this part of the paper we build a progress index, which has the properties that reflect our theoretical approach.

We argue that there is a strong link between the theoretical analysis and empirical analysis. Empirical results depend on the method used and they can cause several interpretations of reality and various policies. Our progress index has two fundamental properties: multidimensionality and social sustainability.

The first property, *multidimensionality*, is essential because progress involves various aspects of social life and therefore economic development is not the only dimension of development but one of the dimensions. The dimensions we consider are the following:

1. Environment (E).
2. Economy & Labour (EL).
3. Rights & Citizenship (RC).
4. Education & Culture: (EC).
5. Health (H).
6. Gender Equity: (GE).
7. Participation (PA).
8. Innovation (I).
9. Security & Legality (SL).

Dimensions 1-7 have already been aggregated into a synthetic index called QUARS (Index of Regional Quality of Development) used by the Lunaria Institute for the «Campaign Sbilanciamoci!». This is a civil initiative to create an index for monitoring the status of the quality of life in Italian regions. We chose the Lunaria's Italian Regional database because for various raisons. First of all, we decided to conduct an empirical analysis using regional data, because at regional level there is a larger availability of non-economic variables that result crucial for development processes.[4] Secondly, the Lunaria's database is one of the biggest database useful for regional development analysis in Italy, where all data come from institutional sources and are freely available. Thirdly, the construction of such a database is the result of a consultation process on variable selection among Italian academic experts and civil society organisations. Thus, all considered variables are a good approximation of the real concept of progress in Italy; in other terms, Lunaria's database not only represent the multidimensionality of development among Italian regions, but also, according to the Sen approach, can be an instrument of development by enforcing one of the relevant elements of the empowerment process: the awareness of the development priorities. Finally, the Lunaria's database and the relative QUARS Index is diffused at international level, in fact it has been included among best practices at EU's «Beyond GDP» conference[5] and it is considered in the OECD's Global Project;

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[4] For the same reasons, empirical studies on social capital are typically based at regional level. See the seminal work of Putnam (1993).

[5] See Goossens (2007).

moreover at regional level was adopted in two regions (Lazio and Toscana) in their documents for economic planning.[6]

For the *Environment* dimension, variables are linked to the environmental impact of human activity and the policies to attenuate pollution. For the *Economy & Labour* dimension, variables are linked to economic exclusion mechanisms. For the *Rights&Citizenship* dimension, variables are linked to social exclusion and social assistance mechanisms. For the *Education & Culture* dimension, variables are linked to the level of education and to the opportunities of education and culture improvements. For the *Health* dimension, variables are linked to the quality and efficiency of the hospital structures, health prevention and territorial assistance. For the *Gender Equity* dimension, the variables are linked to womens' participation in social, economiz and political life. For the *Participation* dimension, the variables linked to all practices that aim to increase the quality of democracy.

In accordance with the Classical approach, we introduce two other dimensions for taking into consideration the relevance for the development process of technical progress, and ethics and respect of law institutions. For the *Innovation* dimension, there are variables linked to public and private R&D and technical human resources. In particular we introduced «labour productivity of small and medium enterprises» to include also the innovations that increase the value of this variable and that can depend on economies of scale (through demand increases) or efficiency of investments stimulated by increases of labour cost.[7] For the *Security & Legality* dimension, there are variables linked to crimes and irregular labour. We are aware of the difficulty of quantifying these «complex social aspects», in fact we consider our attempt a first approximation but also a necessity to better understand the development processes(see appendix for further details).

The property of multidimensionality is linked with the Smithian idea of the interaction between economic development and civil development: in fact the bidirectional relationship is founded on the links across many socioeconomic variables. Multidimensionality is a necessary condition to generate virtuous development circle.

The second property of the progress index is *social sustainability* defined as not perfect substitutability of dimensions. In fact we argue that only a balanced development is socially sustainable.[8] To take this concept into account in our index we use the concave average method. This method, created by Casadio Tarabusi E. and Palazzi (2004), penalizes the development level in proportion to its deviation from a level where the values of all dimension are the same. This penalization decreases with an increase in the level of development. The property of social sustainability reinforces the

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[6] See Rondinella, Segre, Mascherini, (2009).

[7] See Corsi and Guarini (2008), Guarini (2009).

[8] See Lauri and Palazzi (1998), Palazzi (2004).

Classical concept of interaction between economic and civil development because, for a given level of progress, the balance across dimensions can indicate the presence of virtuous circles among social system and economic system; by contrast, an unbalance means that there are weak links among development dimensions. Moreover, according to the Classical lesson of Sylos Labini, since development processes are cumulative, the balance among dimensions can influence the sustainability of development positively. Thus, the imperfect substitutability of dimensions means that all factors are indispensable and they also reciprocally self-reinforce thanks to internal links.

Graph 2.   **EQUAL DEVELOPMENT AND THE IMPERFECT SUBSTITUTABILITY OF DEVELOPMENT DIMENSIONS**
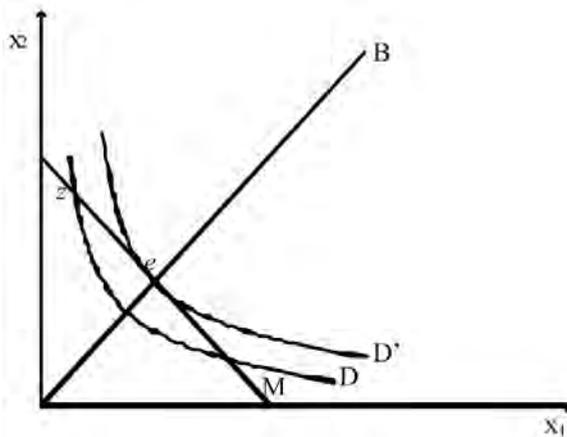
Sources: Own elaboration.

Graph 2 explains this concept clearly. Assuming only two dimensions x_1 and x_2, for simplicity, we can see the «equal development» line M built with a simple average, the «equal development» curves D and D' built with a concave average (where curve D' represents a level of development higher than the development level of curve D) and the bisector line B. Point *e* represents the combination of the same level of two dimensions ($x_1 = x_2$) and point *z* represents a combination where the level of dimension x_2 is higher than that one of dimension x_1 ($x_2 > x_1$). With simple average method points *e* and *z* are both on the line M and these points represent same level of development; while with the concave average method point *e* represents an higher level of development with respect to point z in fact the first one is in the curve D' and second one is in the curve D. The concave method measures the level of development by penalizing the unbalanced combination of x_1 and x_2 (point *z*) with respect to their perfectly balanced combination (point *e*).

The index is calculated with this function:

$$F(x_1, \dots x_n) = \frac{\sum_{i=1}^{n} w_i (x_i - a_i e^{-b_i x_i})}{\sum_{i=1}^{n} w_i}$$

where x_i is the variable, w_i is the weight, a_i and b_i are the parameters of «equal development curve»(as D and D') that are related to the intensity of penalization of unbalanced development and intensity of complementarities between dimensions.   The function F is defined and smooth on the whole R_N, strictly increasing with respect to each variable separately, strictly concave, and asymptotic to $\sum_{i=1}^{n} w_i x_i / \sum_{i=1}^{n} w_i$ for large $x_1, \dots, x_N$.[9] To make the analysis easy, we assume $a_i = b_i = 1$:

Moreover we assume $w_i = 1$ to give the same weight to each dimension. The last assumption means that all dimensions have the same importance for development. The concave average method assumes imperfect substitutability among dimensions, while the simple average method assumes perfect substitutability between dimensions. To decide how to choose the type of average and the dimensions to use, with respect to construction of indices, we follow the QUARS methodology[10]: firstly if the variable is negative for development, it is multiplied by -1. Secondly the variable is standardised[11]. Thirdly for each dimension an index is built that is an average of a group of variables. Fourthly each dimension index is standardised. Fifthly, a synthetic index is built by using an average method. Finally the synthetic index is standardised. By construction, the values are between -1 and 1 in 95 percent of the cases and the average is 0.[12] The database of QUARS variables is in the QUARS Report (2006, 2007, 2008) and the database of variables of our new dimensions is on the ISTAT website (dated March 2009). When we consider seven QUARS dimensions with our two dimensions together, we will use only the

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[9] For the deepening of mathematical properties of the function see Casadio Tarabusi and Palazzi (2004).

[10] See Lunaria (2008).

[11] If y is a variable the standardisation consists in this operation:
$(y_j - \mu)/\sigma$ where μ is the simple average and σ is the standard deviation, for each j observation.

[12] The QUARS values are between -1 and 1, the F(x) is built for the values between 0 and 1, and we make algebrical transformation $\dfrac{\sum_{i=1}^{n} w_i (2g - 1)}{\sum_{i=1}^{n} w_i}$ where $g=(z-ae^{-bz})$, $z=(s+1)/2$.

most recent data available from the QUARS Report (2008) and the ISTAT website (March 2009).

We aim to build a final progress index (P) gradually, by starting from the QUARS index (Q) and by making comparisons between the QUARS index and an intermediate Progress index to estimate their differences and to test the usefulness of the new index P. In conclusion, the progress index is dissimilar from the QUARS indices because of the method of calculation (the first is computed by using a concave average while the second is computed by using a simple average) and for the number of dimensions (the P index is composed of the seven dimensions of QUARS plus «Innovation» and «Security & Legality»).

Diagram 1.   **DIFFERENT KINDS OF ANALYSIS**

Analysis	New indicator	New indicators respect to QUARS	
		Variables	Method
Methodological Analysis	C	Same	Different
Component Analysis	QIN, QSL, QINSL	Different	Same
Global Analysis	CIN, CSL, P(=CINSL)	Different	Different

Sources: Own elaboration.

Our empirical work consists on three kinds of analysis. Initially we do an analysis where comparisons between our intermediate progress indices and QUARS depend only on a change of method (Methodological Analysis). In fact we build an index C that has the same variables as QUARS, but is produced using the concave average method. The series considered are from 2006, 2007 and 2008 and the comparisons are relative to temporal rank variations and to rank variations for every year. Successively, we execute an analysis where comparisons between the QUARS index and our intermediate progress index depend only on different dimensions (Dimension Analysis). In fact we build intermediate progress indices with the simple average method, but they incorporate both the QUARS dimensions and our new dimensions separately and together: «Innovation» (QI index), the «Security & Legality» (QSL index), and both (QISL index). Finally, we do an analysis where comparisons between the QUARS indices and our intermediate progress index depend on both a difference in method and different dimensions (Global Analysis). In fact we gradually build the progress index «P» by starting from C and adding first only «Innovation» (CIN index) next only «Security & Legality» (CSL index); finally we add both new dimensions to the C index

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and we obtain our progress index «P». Comparisons are made between the indices in terms of both ranking and absolute values. We also performed a disequilibrium analysis to discover which dimension is the main cause of unbalanced development for each region. The empirical analysis concludes with the final comparison between the final Progress index and QUARS index.

Methodological analysis

At first, we want to verify if different methods cause a significant difference of results in terms of ranks. We compare the QUARS index with the C index that has the same variables as QUARS but is built using the concave average method for temporal rank variations. Table 1 shows that for the 06-07 period the percentage of regions with different temporal variations is 50 percent, while for the 07-08 period it is 65 percent, finally for the 06-08 period it is 50 percent. We saw some significant results; there are relevant differences in terms of temporal rank variations: in reference to the 2006-2007 period for Valle d'Aosta and Liguria this difference is 3, in reference to the 2007-2008 period for Piemonte, Lombardia e Trentino Alto Adige this difference is 2 and in reference to the 2006-2008 period for Valle d'Aosta and Lombardia the difference is 2. Finally, in three regions the sign of the temporal rank variation is different: in the 2007-2008 period , according to the Q index, Liguria gains 1 position, instead according to C index it loses 2 positions; in the 2006-2008 period according to the Q index Piemonte and Veneto lose 1 position while according to C index they gain 1 position.

Table 2 shows a comparison between indices Q and C relative to the different ranks for each year during the 2006-2008 period . The percentage of regions with dissimilar ranks is 30 percent in 2006, 40 per cent in 2007 and 35 percent in 2008. Also these results demonstrate the relevance of using diverse methods. There some cases where the rank difference is 4 (Valle d'Aosta in 2007) and 3 (Liguria in 2007 and Valle d'Aosta in 2008).

Dimension analysis

The dimension analysis points out the importance of including «Innovation» (I) and «Security & Legality» (SL) in the QUARS indices. In table 3 dQI is the rank difference between QUARS and QUARS with «Innovation»; dQSL is the rank difference between QUARS and QUARS with «Security & Legality»; finally dQISL is the rank difference between QUARS and QUARS with «Innovation» and «Security & Legality». Table 3 shows that the percentage of regions with different ranks is 30 percent by introducing only «Innovation» (dQI), 55 percent by introducing only Security & Legality (dQSL) and 40 percent by introducing both dimensions (dQISL). Regarding rank difference due to «Innovation» (dQI), the regions with the largest «rank gain» are Piemonte (+4) and Lombardia (+3); while Valle d'Aosta is the region with the largest «rank loss» (-4). Regarding rank difference due to «Security &

Table 1. **METHODOLOGICAL ANALYSIS: TEMPORAL RANK VARIATIONS OF ITALIAN REGIONS**

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Region	Q07	Q 07_06	C07	C 07_06	Region	Q08	Q 08_07	C08	C 08_07	Q 08_06	C 08_06
Piemonte	7	2	7	2	Piemonte	10	-3	8	-1	-1	1
Valle d'Aosta	8	-2	12	-5	Valle d'Aosta	6	2	9	3	0	-2
Lombardia	10	1	10	1	Lombardia	8	2	10	0	3	1
Trentino-Alto Adige	1	0	3	-1	Trentino-Alto Adige	1	0	1	2	0	1
Veneto	9	-1	8	0	Veneto	9	0	7	1	-1	1
Friuli-Venezia Giulia	6	1	6	0	Friuli-Venezia Giulia	3	3	3	3	4	3
Liguria	12	0	9	3	Liguria	11	1	11	-2	1	1
Emilia-Romagna	2	1	1	2	Emilia-Romagna	2	0	2	-1	1	1
Toscana	3	-1	2	-1	Toscana	4	-1	4	-2	-2	-3
Umbria	5	-1	5	-1	Umbria	5	0	5	0	-1	-1
Marche	4	1	4	1	Marche	7	-3	6	-2	-2	-1
Lazio	14	0	14	1	Lazio	12	2	12	2	2	3
Abruzzo	11	-1	11	-1	Abruzzo	13	-2	13	-2	-3	-3
Molise	16	-1	16	-2	Molise	16	0	15	1	-1	-1
Campania	20	0	20	0	Campania	20	0	20	0	0	0
Puglia	18	-1	17	0	Puglia	18	0	18	-1	-1	-1
Basilicata	15	1	15	1	Basilicata	15	0	16	-1	1	0
Calabria	17	2	18	1	Calabria	17	0	17	1	2	2
Sicilia	19	-1	19	-1	Sicilia	19	0	19	0	-1	-1
Sardegna	13	0	13	0	Sardegna	14	-1	14	-1	-1	-1
Percentage of regions with different temporal variation				50	Percentage of regions with different temporal variation				65		50

Sources: Own elaboration.

Legality» (dQSL), the regions with the largest «rank loss» are Emilia-Romagna, Toscana, Umbria, Lazio (-2), and the region with the largest «rank gain» is Valle d'Aosta (+3). Finally, by considering both «Innovation» and «Security & Legality»(dQISL), Umbria is the region with the largest rank loss, while Marche and Veneto are the regions with the largest rank gain.

Table 2.   **COMPARISON BETWEEN NDICES AND C. RANK DIFFERENCES**

Region	Q06	Δ06	Region	Q07	Δ07	Region	Q08	Δ08
Piemonte	9	0	Piemonte	7	0	Piemonte	10	2
Valle d'Aosta	6	-1	Valle d'Aosta	8	-4	Valle d'Aosta	6	-3
Lombardia	11	0	Lombardia	10	0	Lombardia	8	-2
Trentino-Alto Adige	1	-1	Trentino-Alto Adige	1	-2	Trentino-Alto Adige	1	0
Veneto	8	0	Veneto	9	1	Veneto	9	2
Friuli-Venezia Giulia	7	1	Friuli-Venezia Giulia	6	0	Friuli-Venezia Giulia	3	0
Liguria	12	0	Liguria	12	3	Liguria	11	0
Emilia-Romagna	3	0	Emilia-Romagna	2	1	Emilia-Romagna	2	0
Toscana	2	1	Toscana	3	1	Toscana	4	0
Umbria	4	0	Umbria	5	0	Umbria	5	0
Marche	5	0	Marche	4	0	Marche	7	1
Lazio	14	-1	Lazio	14	0	Lazio	12	0
Abruzzo	10	0	Abruzzo	11	0	Abruzzo	13	0
Molise	15	1	Molise	16	0	Molise	16	1
Campania	20	0	Campania	20	0	Campania	20	0
Puglia	17	0	Puglia	18	1	Puglia	18	0
Basilicata	16	0	Basilicata	15	0	Basilicata	15	-1
Calabria	19	0	Calabria	17	-1	Calabria	17	0
Sicilia	18	0	Sicilia	19	0	Sicilia	19	0
Sardegna	13	0	Sardegna	13	0	Sardegna	14	0
Percentage of regions with different rank	30			40			35	

Sources: Own elaboration.

Global analysis

In this section we conduct a global analysis by gradually building the final Progress index (P). The index has seven QUARS dimensions and our new dimensions «Innovation» and «Security & Legality» and it is built by using the concave average method. We start with C index and add its two new dimensions. dCI is the rank difference between C and C with «Innovation»; dCSL is the rank difference between C

Table 3.   **DIMENSION ANALYSIS**

Region	Q	dQI	dQSL	dQISL
Trentino-Alto Adige	1	0	0	0
Emilia-Romagna	2	0	-2	-1
Friuli-Venezia Giulia	3	0	1	1
Toscana	4	0	-2	0
Umbria	5	-2	-2	-3
Valle d'Aosta	6	-4	3	0
Marche	7	-2	2	2
Lombardia	8	3	-1	-1
Veneto	9	1	1	2
Piemonte	10	4	0	0
Liguria	11	0	0	0
Lazio	12	0	-2	-1
Abruzzo	13	0	1	1
Sardegna	14	0	1	0
Basilicata	15	0	0	0
Molise	16	0	0	0
Calabria	17	0	0	0
Puglia	18	0	0	0
Sicilia	19	0	0	0
Campania	20	0	0	0
Percentage of regions with different rank		30	55	40

Sources: Own elaboration.

and C with «Security & Legality»; dCISL, is the «rank difference» between C and P that is C with «Innovation» and «Security & Legality». The percentages of regions with rank changed are high: 45 for dCI, 55 for dCSL and 40 for dCISL. With reference to «Innovation» (dCI), the regions that improve their rank significantly are Piemonte (+3) and Lombardia (+2), instead the regions that worsen their rank significantly are Valle d'Aosta (-2) and Veneto (-2). With reference to «Security & Legality» (dCSL), Marche and Valle d'Aosta have the most significant rank improvement (+3), while Emilia Romagna, Umbria and Lazio have the most relevant rank worsening (-2). Finally, with reference to both dimensions, that is the case of P index, (dP) the regions that improve their ranks are Friuli Venezia Giulia, Marche, Abruzzo and Basilicata (+1), instead those ones that have rank worsening are Emilia Romagna, Umbria, Lazio and Molise (-1).

Table 4.   **GLOBAL ANALYSIS**

Region	C	dCI	dCSL	dP	Region	C	dCI%	dCSL%	dP%
Trentino-Alto Adige	1	0	0	0	Trentino-Alto Adige	1,14	-4	5	3
Emilia-Romagna	2	0	-2	-1	Emilia-Romagna	0,96	9	-13	-1
Friuli-Venezia Giulia	3	0	1	1	Friuli-Venezia Giulia	0,89	7	3	12
Toscana	4	0	-1	0	Toscana	0,85	-4	-3	-5
Umbria	5	-1	-2	-1	Umbria	0,76	-8	-8	-14
Marche	6	-1	3	1	Marche	0,75	-12	15	4
Veneto	7	-2	-1	0	Veneto	0,59	3	4	8
Piemonte	8	3	-1	0	Piemonte	0,58	23	-30	-4
Valle d'Aosta	9	-2	3	0	Valle d'Aosta	0,55	-29	29	-0
Lombardia	10	2	0	0	Lombardia	0,53	24	-42	-14
Liguria	11	1	0	0	Liguria	0,37	17	-18	1
Lazio	12	0	-2	-1	Lazio	0,18	86	-196	-94
Abruzzo	13	0	1	1	Abruzzo	0,06	38	227	245
Sardegna	14	0	1	0	Sardegna	-0,11	142	-98	49
Molise	15	-1	0	-1	Molise	-0,63	36	-33	7
Basilicata	16	1	0	1	Basilicata	-0,68	12	-37	-20
Calabria	17	0	0	0	Calabria	-1,40	7	-8	1
Puglia	18	0	0	0	Puglia	-1,53	1	-9	-6
Sicilia	19	0	0	0	Sicilia	-1,75	-5	-5	-8
Campania	20	0	0	0	Campania	-2,11	-9	17	8
Percentage of regions with different rank		45	55	40	Percentage of regions with level change (=>10%)		50	60	35
					whose worsening		50	50	57
					whose improving		50	50	43

Sources: Own elaboration.

With the respect to the same variables, we also calculate the percentage difference of the absolute values of the indices. In this way we can analyze the regional context regardless of other regions. The percentage differences are represented respectively by dCI%, dCSL% and dP%. Since the average of the values is zero thanks to standardisation, for the negative values that are below the dotted line, the positive (negative) sign of the percentage difference is negative (positive) for development because this means that the region moves away from (approaches) the average. In this case it is opportune to examine the sign and dimension of the percentages rather than their specific values. In general, we note

that the percentage of regions with percentages change equal or greater than 10 percent, is 50 percent with regards to «Innovation» (dCI%) and 60 percent with regards to «Security & Legality» (dCSL%). Among these regions, 50 percent have their ranks lowered when taking into account both «Innovation» and «Security & Legality». Some specific results are noteworthy. Lazio represents a complex situation: it has the greatest improvement due to the inclusion of «Innovation» (dCI% is equal to +86 percent) but has the greatest drop due to the inclusion «Security & Legality» (dCSL% is equal to -196 percent) and progress (dP% is equal to -94 percent). Instead Abruzzo has a major improvement from «Security & Legality» (dCSL% is equal to +227 percent) and progress (dP% is equal to +245 percent). With regards to «Innovation», Southern regions (except Sicily and Campania) worsen their ranks, while for «Security & Legality» Southern regions (except Campania) improve their ranks. This last result points out that there are limits in the effects that we are able to capture through the use of quantitative variables for the phenomenon of «Security & Legality» and that this phenomenon is complex because of the numerous causes, effects and localization. Finally by comparing the rank change analysis with percentage change analysis, we discover that intra-regional dynamics do not correspond completely with the inter-regional dynamics; for example Abruzzo, with respect to differences between CSL and C and between C and P, has very relevant improvements in terms of percentage difference of absolute values, but it gains only one position in terms of rank differences.

Table 5 shows the rank differences di between the P index and the i dimension indices (where i = E, EL, EC, H, GE, PA, I, SL). For each region there are interesting results, but we want to stress some more general aspects. First, the dimension indices that have more cases of rank difference, equal or greater than 5, are «Environment» (E), «Innovation» (I) and «Security & Legality» (SL). Second, the region with the greatest number of dimension indices with rank differences, greater than or equal to 5, are all in the Centre-North (Trentino Alto Adige, Friuli Venezia Giulia, Umbria, Valle d'Aosta, Lombardia and Lazio). Thirdly, as the progress index ranking decreases, the number of cases of worsening decreases. Table 6 shows the Sperman index of cograduation among all indices (dimension and progress indices). The remarkable result is that «Environment», «Innovation», «Education & Culture» and «Security & Legality» have the lowest cograduation with the progress index. In particular, the cograduation between the «Security & Legality» index and the progress index is 0.1 and in some cases the cograduation with other index is negative. This dimension is fundamental for civic and economic development, but it is very complex and it needs its own analysis.

Table 5.   **RANK DIFFERENCES BETWEEN THE PROGRESS INDEX «P» AND DIFFERENT DIMENSION INDICES**

Region	P	dE	dEL	dRC	dH	dEC	dEO	dPA	dI	dSL	N°component indicator with rank difference = >5	whose worsening
Trentino-Alto Adige	1	0	0	-1	-3	-14	-9	0	-6	-5	4	4
Friuli-Venezia Giulia	2	-11	-1	1	1	1	-9	-7	-3	-6	4	4
Emilia-Romagna	3	-5	-2	-7	0	-2	0	-2	1	-13	3	3
Toscana	4	1	-2	-14	-4	0	2	2	-5	-8	3	3
Marche	5	-5	1	2	-4	-1	-4	-2	-7	1	2	2
Umbria	6	-1	-6	2	-6	3	2	2	-5	-8	4	4
Veneto	7	-10	5	1	1	-3	0	4	-1	-2	2	1
Piemonte	8	4	1	-5	3	-1	2	-3	7	-9	3	2
Valle d'Aosta	9	7	1	2	-5	-7	8	1	-5	7	6	3
Lombardia	10	-8	1	2	8	3	2	4	7	-8	4	2
Liguria	11	-3	1	0	1	3	6	1	5	-4	2	0
Abruzzo	12	6	1	3	1	0	-1	-3	2	7	2	0
Lazio	13	2	0	-4	6	11	1	0	9	-6	4	1
Sardegna	14	5	-1	9	1	1	0	2	-3	7	3	0
Basilicata	15	10	-1	1	0	-5	0	1	-1	14	3	1
Molise	16	0	2	4	0	5	0	0	-4	13	2	0
Calabria	17	5	-3	1	-3	3	0	0	-2	6	2	0
Puglia	18	-1	1	3	-1	-1	-2	0	0	8	1	0
Sicilia	19	4	0	0	2	2	1	0	4	6	1	0
Campania	20	0	2	0	2	2	1	0	7	0	1	0
Percentage of regions with rank difference = >5		50	10	20	20	25	20	5	50	80		
whose worsening		50	50	75	50	60	50	100	50	50		
whose improving		50	50	25	50	40	50	0	50	50		

Sources: Own elaboration.

Table 6. **SPERMAN INDEX OF COGRADUATION**

	P	E	EC	R	H	EC	EO	PA	I	SL
P	1									
E	0,5	1								
EC	0,9	0,4	1							
R	0,7	0,3	0,7	1						
H	0,8	0,3	0,8	0,5	1					
EC	0,6	0,1	0,5	0,3	0,7	1				
EO	0,8	0,5	0,7	0,4	0,6	0,6	1			
PA	0,9	0,5	0,9	0,6	0,7	0,6	0,8	1		
I	0,6	0,2	0,7	0,2	0,9	0,6	0,6	0,6	1	
SL	0,1	0,4	0,1	0,4	-0,2	-0,3	-0,1	0,0	-0,5	1

Sources: Own elaboration.

Disequilibrium analysis

By using the concave average method we penalize regions whose development is umbalanced with regard to dimensions and we give the same weights to each dimension ($w_i = 1$). In table 7 we compare the progress index P with the intermediate progress indices P_i (where i = E, EL, EC, H, GE, PA, I, SL); for each dimension, we put $w_i = 2$ to calculate each Pi index. Thus, with regard to the *ith* dimension if the region improves (worsens) its rank it means that regional development is characterised by an excess (deficiency) of the *ith* dimension. The analysis considers both rank differences (dPi) and percentage differences of absolute values (dPi%). With respect to percentage differences and rank differences, the dimensions with the highest percentage of regions that modify levels, equal or higher than 10 percent, or ranks are «Security & Legality», «Environment» and «Education». With reference to percentage differences, Lazio is the region that has the highest difference (except for Economy and Labour) between P and the other indices. With reference to rank difference Valle d'Aosta is the region with the greatest number of changes of rank.[13]

Finally, in table 8 we compare the QUARS index «Q» and our progress index «P» both in terms of percentage difference of absolute values and in terms of rank difference. The general results are interesting. Firstly, two kinds of changes are significant. The percentage of regions with a percentage difference equal to or greater than 10 percent is 65 percent and the percentage of regions whose rank changed is

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[13] We remember that for the negative value, below the dotted line, the positive (negative) sign of percentage difference is negative (positive) for the development because this means that the region moves away from (approaches) the average.

Table 7. **DISEQUILIBRIUM ANALYSIS**

Region	P	dPE%	dPEL%	dPRC%	dPH%	dPEC%	dPPA%	dPEO%	dPI%	dPSL%	P	dPE	dPEL	dPRC	dPH	dPEC	dPPA	dPEO	dPI	dPSL
Trentino-Alto Adige	1,2	20	-2	-2	1	-18	-8	7	-3	3	1	0	0	0	0	-2	0	0	0	0
Friuli-Venezia Giulia	1,0	-12	-2	3	6	8	-9	-4	5	1	2	-1	0	0	0	1	-1	0	0	0
Emilia-Romagna	0,9	-6	-2	-8	5	5	4	0	8	-12	3	1	0	0	0	1	1	0	0	-1
Toscana	0,8	8	-1	-24	-5	10	9	6	-3	-4	4	0	0	-3	0	0	0	0	0	-1
Marche	0,8	-6	1	3	-5	5	-4	2	-10	11	5	0	0	1	0	0	0	0	0	2
Umbria	0,7	-0	-5	5	-12	15	3	6	-7	-8	6	-1	-1	1	-3	0	0	0	-2	-2
Veneto	0,6	-21	7	1	5	-5	-2	7	2	2	7	-2	1	1	1	0	-1	0	0	0
Piemonte	0,6	8	4	-8	11	-3	2	-13	21	-28	8	0	0	-1	1	0	-1	-2	2	-1
Valle d'Aosta	0,5	24	5	0	-21	-34	20	4	-25	24	9	3	0	1	-1	-2	2	1	-2	3
Lombardia	0,5	-49	6	1	25	11	2	12	26	-42	10	-2	0	0	2	1	0	1	1	-2
Liguria	0,4	-23	8	-3	0	8	13	-7	15	-17	11	1	0	0	0	1	0	0	1	1
Abruzzo	0,2	24	15	19	-12	-23	-1	-77	3	52	12	1	0	0	0	-1	0	0	0	1
Lazio	0,0	-153	-4	-628	573	1590	246	-346	1459	-2839	13	0	0	-1	0	1	0	0	0	-1
Sardegna	-0,2	-16	33	-82	3	11	18	6	80	-59	14	0	0	1	0	0	0	0	0	1
Basilicata	-0,5	-23	3	-11	9	39	-0	1	16	-39	15	0	0	0	0	-1	0	0	0	0
Molise	-0,7	3	-3	-17	7	-12	7	9	29	-27	16	0	0	0	0	1	0	0	0	0
Calabria	-1,4	-6	13	-10	6	-3	0	-2	6	-7	17	0	-1	0	-1	0	0	0	-1	0
Puglia	-1,4	6	-5	-11	4	3	7	-1	2	-8	18	0	1	0	1	0	0	0	1	0
Sicilia	-1,6	-3	3	7	-3	-0	0	0	-4	-5	19	0	0	0	0	0	0	0	0	0
Campania	-2,3	1	-5	9	-5	-2	-3	-2	-8	12	20	0	0	0	0	0	0	0	0	0
Percentage of regions with different level (=>10%)		50	15	40	30	50	20	20	45	60	Percentage of regions with different rank	40	20	40	35	50	25	15	35	55
whose worsening		50	33	25	50	50	25	75	56	50										
whose improving		50	67	75	50	50	75	25	44	50										

Sources: Own elaboration.

50 percent. Secondly, in absolute value terms the region with the biggest improvement is Abruzzo (306 percent) and the biggest decline regards Lazio (79 percent); while in rank terms, the biggest improvement regards Marche, Veneto and Piemonte (2 ranks) and the biggest decline regards Valle d'Aosta (3 ranks).

Table 8.   **COMPARISON OF THE QUARS INDEX «Q» AND PROGRESS INDEX «P»**

Region	Q	P	% DIFFERENCE	Q rank	P rank	RANK DIFFERENCE
Trentino-Alto Adige	1,52	1,17	-23	1	1	0
Emilia-Romagna	0,99	0,95	-5	2	3	-1
Friuli-Venezia Giulia	0,97	1,00	3	3	2	1
Toscana	0,87	0,81	-7	4	4	0
Umbria	0,68	0,65	-4	5	6	-1
Valle d'Aosta	0,67	0,55	-19	6	9	-3
Marche	0,67	0,77	15	7	5	2
Lombardia	0,59	0,46	-22	8	10	-2
Veneto	0,58	0,64	11	9	7	2
Piemonte	0,46	0,56	22	10	8	2
Liguria	0,24	0,37	57	11	11	0
Lazio	0,05	0,01	-79	12	13	-1
Abruzzo	-0,09	0,19	-306	13	12	1
Sardegna	-0,27	-0,16	-39	14	14	0
Basilicata	-0,72	-0,54	-25	15	15	0
Molise	-0,76	-0,67	-12	16	16	0
Calabria	-1,33	-1,41	7	17	17	0
Puglia	-1,56	-1,44	-7	18	18	0
Sicilia	-1,68	-1,61	-4	19	19	0
Campania	-1,88	-2,29	22	20	20	0
Percentage of regions with different level (=>10%)			65	Percentage of regions with different rank		50
whose worsening			38			
whose improving			62			

Sources: Own elaboration.

4. **CONCLUSIONS**

Following the Classical approach (particularly the Smithian approach), we argued that a dynamic interaction exists between civil development and economic development. First we showed the main links between these two dimensions of development. Economic development and civil development interact over time in a circular way, with different cumulative causal relations: economic development can enhance civil development through decreases in poverty, the increase of social infrastructure, competition that improves the efficiency of the production system, and the improvement of the quality of work. While civil development can increase economic development through three factors: culture, institutions and ethics. Second, we built a progress index with two properties that derive directly from our theoretical framework: multidimensionality and social sustainability. As regards multidimensionality, the progress index considers nine dimension of development: Environment, Economy & Labour, Rights & Citizenship, Gender Equity, Education & Culture, Health, Participation, Security & Legality and Innovation. Each dimension is an aggregation of various variables. Within our framework, the concept of social sustainability means imperfect substitutability of dimensions because only balanced development is socially sustainable. To introduce this concept into our index we used the concave average method of Casadio Tarabusi-Palazzi (2004) that penalizes development which is not balanced between variables. We built the index gradually by starting from the famous QUARS index, built by the Lunaria Institute for the Sbilanciamoci! Campaign to monitor the quality of life in the Italian regions. This index is composed of all the dimensions we considered except Security & Legality and Innovation and it uses a simple average.

We compared the QUARS index approach with our approach by building various intermediate progress indices. In the first analysis we compared changes in results due to differences in methodology , in the second analysis we compared changes in results due to considering additional dimensions. In the global analysis we compared changes in results due to both factors and we compared the QUARS index and our final progress index. According to the results, there are significant rank differences and absolute value differences between the QUARS index approach and our Progress index approach for Italian regions and these depend on the introduction (separately and together) of both our new dimensions (Innovation and Security & Legality) and using the concave average method. Finally, although we consider the creation of our synthetic development index a «work in progress» because of the complexity of the concept, we think that it is important to improve these empirical studies with the introduction of variables linked with innovation and with ethics and law institutions (that we have approximated with the variables related to security and legality), and socially sustainable development in terms of the imperfect substitutability of dimensions.

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APPENDIX: List of Variables

		Component		Variable	Data base
P - PROG	Q - QUARS	E - ENVIRONMENT	1	population density	LUNARIA
			2	environmental illegality	
			3	the use of fertilisers in agriculture	
			4	the quality of the air	
			5	the impact generated by mobility	
			6	protected areas	
			7	the differentiated collection	
			8	the production of energy from renewable sources	
			9	the spread of biological farming	
			10	the eco-management	
		EC - ECONOMY&LABOUR	11	the job insecurity	
			12	unemployment index	
			13	poverty index	
			14	GINI index	
		R - RIGHTS	15	the right to a home	
			16	the access to basic services	
			17	the risk of exclusion	
			18	social assistance	
			19	the social exclusion of younger generations	
			20	the inclusion level of immigrants	
		H - HEALTH	21	hospital migration	
			22	synthetic indicator of the innovative procedures for reducing waiting lists in the healthcare system	
			23	the satisfaction of citizens for the health services received	
			24	the proportion of the female population undergoing cancer screening	
			25	preventable death	
			26	the percentage of elder people assisted by Integrated Home Assistance	
		ED - EDUCATION	27	the quota of the population who have obtained a degree	
			28	the net balance of migration of universitary students	
			29	the quality of school structures	
			30	the average annual expenditure on theatrical and musical shows	
			31	the number of libraries for 100.000 inhabitants	
			32	population aged between 14 and 18 attending high school	
		GE - GENDER EQUITY	33	the share of women present in Regional Councils	
			34	the difference between female and male activity rates	
			35	the availability of municipal crèches	
			36	the spread of family advice over the regional territory, that have the task of supporting self determination of the woman in sexual choices	
		PA - PARTICIPATION	37	People aged 14 and above who have taken part in voluntary and ecological association, civil rights or peace meetings or who carried out activities free of charge for voluntary associations	
			38	the number of voluntary associations with respect to the population	
			39	the circulation of non-sporting daily newspapers	
			40	turnout at the polls.	
			41	the number of civic defenders	
		I - INNOVATION	42	Science&Technology graduates	ISTAT
			43	Producivity of labour in small and medium enterprises	
			44	R&D employees	
			45	Percent of public funding for R&D	
			46	Percent of private funding for R&D	
			47	Companies which have introced innovative products and/or processes	
			48	Regional units which have introduced innovative products and/or processes	
			49	Average regional spending for innovation of companies	
			50	Average regional spending for innovation of regional units	
			51	Patent intensity	
			52	Innovative capacity	
		SL - SECURITY & LEGALITY	53	Criminality of minors (excluding theft)	
			54	Index of the criminality of minors	
			55	Index of diffusion of criminality (1)	
			56	Index of diffusion of criminality (2)	
			57	Organized crime index	
			58	Violent crime index	
			59	Perception of risk of crime by families in the area they live	
			60	Capacity to offer regular work (irregular labour index)	
			61	Microcriminality index in the cities (1)	
			62	Microcriminality index in the cities (2)	