

The \aleph capability matrix: some observations on GDP and the economics of human development¹

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Abstract

The paper argues against (per capita) GDP, even adjusted in different ways, as an appropriate indicator of economic advancement. Product and income accounting have their roots in classical political economy. The classical original focus on the generation and distribution of income among social groups and classes turned in the past century toward the measurement of output and income in a way useful to financing war and evaluating potential military capacity. National economic might as measured by GDP is not an adequate indicator of the economic advancement of a society. The paper puts forward the all-round development of individuals, understood as the enlargement of human capabilities, as the closest interpretation of the idea of (human) development. An attempt is made to give empirical, operational content to the idea, departing from the notion of need. A preliminary inspection of the capability space suggests that needs and capabilities can be analyzed as a hierarchical structure, this implying the possibility, by analogy with input-output analysis, of postulating a capability transformation table, and also a matrix of capability coefficients. The matrix \aleph (aleph) of capability coefficients has inherent potential rates of growth and equilibrium capability proportions. The capability transformation table may also be incorporated within the social accounting matrix framework, and associated with economic accounts, providing relevant information about the capability enhancing functions of different parts of the economy.

Section I.

Economics needs to finally free itself from the fetters of mainstream, bourgeois economics and its mutilated and deformed view of the human being. This constricted view has imposed a heavy burden on society, particularly heavy for those at the bottom of the social ladder.

Mainstream, neoclassical economics is based in a demeaning view of the person, essentially seen as an egotistic or solipsistic automaton permanently trying to maximize material enjoyment. The microeconomics' individual strives to maximize "utility" through consumption. Maximal satisfaction is ensured through market exchange. Here is the fundamental ideological tenet of the theory: market exchange ensures maximal satisfaction and maximal "utility" for everybody. If there are "free markets," if there are no hinders to exchange, says the mainstream theory, we will arrive to an optimal situation, where nobody's utility can increase without decreasing the utility of somebody else. This is the essential message of microeconomics. It is essentially a *laissez faire* message: an apologetic doctrine, according to which any attempt to change the "free-market," optimal state of things ends up in things getting only worse.

¹ I would like to thank the organizers of the 7th International Symposium on Human Development Economics (Hefei, China, August 3-4, 2013) for the opportunity of developing and presenting these ideas. I have also benefited from the comments of an anonymous reader.

Section II.

The approach of the economics of Keynes and his close followers, on the other hand, starts from a drastic observation: the actually existing economic system is not working towards the harmonious optimum promised by the traditional theory. What we observe, on the contrary, is mass unemployment, and extreme inequalities of income and wealth — the two most grievous faults of the existing economic system according to Keynes. We also observe widespread war and revolution. Hence, instead of an apologetic theory for which “free markets” and egotistic individuals alone ensure perfect social harmony, we need a theory able of explaining and coping with the problems we observe in the real world.

Section III.

For that, we must depart from the existing economic system considered as a whole. The supposedly “rational” (that is, consistently egoistic and myopic) behavior of the individual cannot explain the functioning of the economic system as a whole. That leads us back to the perspective of the classical political economy of Smith, Ricardo and Marx. As a structured and dynamic whole, the economic system is composed of interacting elements — elements which are themselves less extensive wholes, in turn composed of less extensive interacting wholes, and so on. The fundamental interacting elements of the societies studied by the classics are the *social classes*. The most basic question to be analyzed by classical political economy is how, through the flow of value within the economic system, are determined the incomes of the main classes of the capitalist economy — namely, how is determined the distribution of income between landlords, capitalists and workers. The fundamental question is the determination of the three fundamental prices of the economy, (land) rent, profits and wages.

William Petty and François Quesnay were among the first to contribute to a comprehensive representation of the existing, real-world economic system. William Petty made the first detailed computation of “the wealth of the Kingdom” adding the total wealth of the different classes and social groups composing England’s economy at the time.²

Quesnay’s *Tableau Économique* (published in 1759) traces the circulation of the social product among what he called “*la classe productive, la classe des propriétaires & la classe stérile*”, social classes representing at the same time different production sectors. The social product is the result of a circular process of production and exchange which involves the reproduction of capital between social classes and within different production sectors. According to Marx (1968 [1863], Chap.VI.6), “this was an extremely brilliant conception, incontestably the most brilliant for which political economy had up to then been responsible.”

“[It] was an attempt to portray the whole production process of capital as a *process of reproduction*, with circulation merely as the form of this reproductive process; and the circulation of money only as a phase in the circulation of capital; at the same time to include in this reproductive process the origin of revenue, the exchange between capital and revenue, the relation

² See *Verbum Sapienti*, Ch.I, in Petty (1899 [1662]). William Petty was for Marx a most ingenious and brilliant economist of deep insights, whose analyses contained in germ the labor theory of value (Marx 1968 [1863], Part I, Addenda 2). Gregory King made a similar computation of the income, expenditure and saving of the population of England in 1688, divided into twenty-six social classes, ranging from temporal lords to vagrants (see description and sources in Stone 1986).

between reproductive consumption and final consumption; and to include in the circulation of capital the circulation between consumers and producers (in fact between capital and revenue); and finally to present the circulation between the two great divisions of productive labour — raw material production and manufacture — as phases of this reproductive process; and all this depicted in a *Tableau* which in fact consists of no more than five lines which link together six points of departure or return — [and this was] in the second third of the eighteenth century, the period when political economy was in its infancy — this was an extremely brilliant conception, incontestably the most brilliant for which political economy had up to then been responsible.” (Marx 1968 [1863], Chap.VI.6)

Marx developed and deepened these ideas in the second volume of *Capital*, providing a first building block of what would become the wide class of structural(ist) models of the economy, such as the input-output economics of Leontief, and the Social Accounting Matrix (SAM) approach related to the work of Richard Stone and associates at the University of Cambridge.³

An important milestone on the way to these new disciplines, not often recalled today, was the attempt to construct a “national economic balance” in the Soviet Union of the 1920s. This intended tool of planning for growth and industrialization, cast in the form of an input-output table for 1923-1924, was an empirical implementation of the ideas underlying the reproduction schemes of Marx.⁴ Still a student at Leningrad University, Wassily Leontief wrote about this work:

“What is essentially new in this balance ... is the attempt to embrace in figures not only the output but also the distribution of the national product, so as to obtain in this way a comprehensive picture of the whole process of reproduction in the form of a kind of ‘Tableau Économique’” (Leontief 1964 [1925]).

The Soviet work on national economic balance may have been the inspiring conceptual link between the reproduction theory of Marx and Leontief’s input-output system.⁵ Be that as it may, for authors cognizant of the Marxian tradition, it was easy to see the direct connection between Marx’s reproduction schemes and Leontief’s input-output models. As Oskar Lange put it:

“[t]he structure of production input equations ... is the same as that of Marx’s schemes... It can be seen that the production input equations are an

³ For details on the extensive work of Stone and associates, see: University of Cambridge, Department of Applied Economics (1962-1972).

⁴ This was published in 1926, and the names associated with it are those of V. G. Groman and P. I. Popov (Stone 1986, p. 121; see also Davies and Wheatcroft 1985). Stalin thought this kind of work was “a game with figures” (Spulber and Dadkhah 1975). Groman was condemned to ten years prison in the “Menshevik trial” of 1930-31, one of the first of a series of show trials in which several prominent economists were condemned (*inter alios* Kondratiev, Chayanov and Ginzburg) — Groman was probably killed while in prison (Jasny 1972).

⁵ Also relevant may have been the fact that Ladislaus von Bortkiewicz was Leontief’s dissertation adviser at Berlin University in the 1920s (Kurz and Salvadori 2000, p. 169). Bortkiewicz (1998 [1907]) was the earliest resolution of the “transformation problem,” of consistently transforming labor values in prices of production (see e.g. Baumol 2000).

extension of the division of the Marxian schemes into n branches.” (Lange 1969, p.47)

Section IV.

In the West, the interest in the workings of the real-world economic system — in contradistinction to the unreal, apologetic model of orthodox economics — came first with the Great Depression, mass unemployment, social turmoil, and the resulting reawakening of interest in the behavior of social classes (such as capitalists-investors, or workers-consumers) and economic aggregates (such as total employment, social product-national income, or profits-investment). And it was in fact a Marxist, Michal Kalecki, who first articulated the ideas that became world-known with the *General Theory* (see e.g. Robinson 1976).

However, it would appear that it was only under the very ominous and devastating pressure of World War II that orthodox economic theory and policy did leave the spotlight — temporarily, as it would be shown few decades after. In effect, one of the first important modern contributions to the conceptual framework of national accounting came from Keynes, and was directed toward formulating national income accounts in a way useful to war finance — his 1941 Government White Paper was entitled *An analysis of the sources of war finance and an estimate of the national income and expenditure in 1938 and 1940*.⁶ Another characteristic title by an important author on the subject, Simon Kuznets, is *Uses of National Income in Peace and War*.⁷

That is, the focus of the modern idea of national product or income was strongly influenced by the interest in assessing the capacity of national resource mobilization for war. The focus was the material might of the nation, particularly the capacity achieved in production for (direct and indirect) military use, and in production that may relatively easily be converted to military use. The material might of the nation reflected its capacity at war. It was relevant, and even crucial, in a world of nations competing for dominance and military supremacy, to be able to evaluate total output, its material components, and the capacity to transform peacetime output in war production. The gross national product of a country is the number that synthesizes the material might of the nation, and which indirectly shows its capacity at war.

Section V.

The early interest in the problem of distribution was thus lost. The increase of national output is interpreted positively even if this involves a decreasing wage share (or in Marxian terms, an increasing rate of exploitation), and diminishing incomes for a large majority. The focus is not the health and advancement of individuals, but the vigour and might of the nation.⁸

The nationalistic emphasis of national accounting is in potential conflict with the logic of capitalism. The logic of capitalism is capital accumulation. The growth and accumulation of

⁶ See UK (1941). Keynes was assisted in this work by James Meade and Richard Stone. It must be said that Petty's and King's original interest was also in assessing England's war potential.

⁷ In this study Kuznets estimates, for instance, that a maximum of about 15 per cent of national product can be turned to war production (Kuznets 1942, p. 16).

⁸ In recent decades, several distribution-sensitive indicators have been proposed. These include, for instance, the *efficiency-equity* index ($GDP \times (one\ minus)\ Gini$), or also the *equal weights* index (in which the incomes of the different income classes are given the same weights) — see e.g. Buzaglo (1984, pp. 112-116). These indicators, however, did not gain any popularity with academia, politics, or the media.

capital are ends in themselves, engraved in the genetic code of the system. The end of capital is not the power of the nation — much less the increased welfare of its members. National power — and occasionally also welfare — are unintended consequences of capital accumulation.

Unsustainable national economic processes, such as for instance massive capital flight, or exploding foreign indebtedness, or structural involution (e.g., de-industrialization, re-primarization or *extractivism*), pertain intimately to the logic of global capitalism, but are alien to the logic of national accounting, in the sense that such phenomena may be indefinitely made consistent with increasing national product. In general, it could be said that the logic of capital is extended reproduction at an ever larger (global) scale, while the perspective of national accounting is, of course, national. National accounting measures the degree of success in the expanded reproduction of national capital — until national capital “goes global.”

Unsustainable environmental processes, such as global warming or natural resource depletion, as we know, have no place in standard national accounting — but there are attempts and proposals for “green accounting,” e.g. including estimates of the costs of depleting “natural capital,” or the costs of environmental degradation. These processes should be reflected by the accounting principles, and as they affect all types of economic systems, they should also affect a prospective human development accounting. The increasing risk of environmental collapse and the costly damage involved in such processes should be reflected by an appropriate reduction of the measure of performance, whatever the indicator would be.

Section VI.

Now, as I see it, the approach of *human development* accounting should be totally different from the approach of *national* accounting. Human development accounting should not try to correct or adjust in different ways the measures of national power as measured by (per capita) GDP, as is the case with the proposals mentioned above — and as is also the case of the *Human Development Index* of the United Nations Development Programme.⁹ Human development accounting should have an appropriate orientation and a clear focus on, yes, human development.

Human development accounting should reflect *human flourishing*, the blooming of individuals and societies. While capitalist development has implied, and still implies, an increased subjection to capital and an increased human alienation (alienation *vis-à-vis* other humans and *vis-à-vis* nature), human development should be the opposite process of human de-alienation and emancipation. Human development and flourishing should be the process by which human beings reintegrate and reconcile with themselves, with each other, and with nature.¹⁰

⁹ The UNDP work represents a huge step forward in comparison with the mainstream view of economic growth and welfare. The Human Development Index, developed under the direction of Mahbub ul Haq (see UNDP 1990), is the geometric mean of three (normalized) indices: life expectancy, education, and income per capita. The main conceptual basis of the index is Sen’s capability approach to welfare and well-being (see e.g. Sen 1985, 1988). Martha Nussbaum is another of the major contributors to the approach (see e.g. Nussbaum 2011). The Aristotelian and liberal philosophical background of this approach is supplemented here by a different, complementary approach, rooted in the radical-Enlightenment perspective of Spinoza (Buzaglo 2003) and the socialist ethics of Marx and others.

¹⁰ In the words of Marx (2004 [1844], p. 104): “It is the definitive resolution of the antagonism between man and nature, and between man and man.”

Human reintegration and reconciliation imply a process of enlargement of the individual perspective towards the inclusion of the Other. In this process, the individual perspective is enlarged beyond the avid and fearful ego — of which *homo oeconomicus* is one of its many incarnations — to increasingly include the larger, multiform ego of fellows, society, humanity, and so on, extending towards endless Nature.

Bertrand Russell introduced the useful notion of *impersonal self-enlargement*.¹¹ Without a successful process of impersonal self-enlargement — which implies the behavioral counterpart of enlarged activity spheres of empathy and solidarity — it seems impossible to advance beyond human alienation and money/capital fetishism.

The jealous control of, and enslavement to, one's possessions originates in the fear of the Other. Self-enlargement is a form of moral enlargement, the development of the moral strength, or fortitude, necessary to overcome the fear of the Other, always threatening to take away from me what I see as my very self, i.e., my cherished possessions. Impersonal self-enlargement enables individuals to not fearfully see the Other as a potential aggressor and enemy, and to increasingly be able to spontaneously function in an environment of human commonality. That is, impersonal self-enlargement is at the same time moral enlargement, or enlarged moral strength. Enlarged moral strength enables individuals to naturally function and flourish in an environment of expanded commons, an environment of enlarged spheres of common property and management.

The crucial question then is: What makes morally intelligent and strong individuals?

Strong individuals, capable of flourishing in a society of equals largely based on common management and common ownership, are individuals who have developed personalities, which have been enriched by an all-round process of increasing aptitude in a growing domain of different exertions.¹²

¹¹ See for instance Blackwell (1985).

¹² As Marx and Engels forcefully put it: “private property can be abolished only on condition of an all-round development of individuals.” (Marx and Engels, 1976 [1845-1846], III, “Conclusion to ‘The Unique’”). It is interesting to see the context of that often cited phrase — we quote the sentence *in extenso*:

“We have already shown above that the abolition of a state of affairs in which relations become independent of individuals, in which individuality is subservient to chance and the personal relations of individuals are subordinated to general class relations, etc. — that the abolition of this state of affairs is determined in the final analysis by the abolition of division of labour. We have also shown that the abolition of division of labour is determined by the development of intercourse and productive forces to such a degree of universality that private property and division of labour become fetters on them. We have further shown that private property can be abolished only on condition of an all-round development of individuals, precisely because the existing form of intercourse and the existing productive forces are all-embracing and only individuals that are developing in an all-round fashion can appropriate them, i.e., can turn them into free manifestations of their lives. We have shown that at the present time individuals *must* abolish private property, because the productive forces and forms of intercourse have developed so far that, under the domination of private property, they have become destructive forces, and because the contradiction between the classes has reached its extreme limit. Finally, we have shown that the abolition of private property and of the division of labour is itself the association of individuals on the basis created by modern productive forces and world intercourse.”

Section VII.

The all-round development of individuals can thus be understood as the process of expanding moral strength. Each facet of the personality expressing a particular capability is a particular virtue. Virtue *is* (moral) power. Expanded virtue implies expanded power over the own self, i.e., increased power to restrain the *passions*. This includes particularly the capacity to restrain economic passions such as avarice, greed and envy.¹³ Expanded virtue also means extended domains of own creative *action*. Moral strength, fortitude and generosity are built by exploring, exercising and strengthening every dimension of the human endeavour.

Section VIII.

These ideas about how to understand human improvement are of course not new. We can find traces of them in many, very old intellectual traditions, East and West, South and North. These old traces have been rediscovered in recent times, and are being cultivated and developed not only in economics, but also by neuroscience, cognitive science and other scientific disciplines — and also within different modern philosophical, psychological and pedagogical schools.

It is not an easy task to try to increase the concrete, empirical content of the general idea of human development as human capability growth. Even more difficult is to express human development in the form of a metric of empirical, measurable dimensions, and to closely relate this metric to the workings of the economic system as a whole. However, as I see it, the huge importance of the task makes any effort in that direction worthwhile. My comments and suggestions are to be understood as tentative and conjectural, and largely taken as an example of the difficulties that such an undertaking may involve.

Section IX.

In my view, one of the first conceptual clarifications that should be done in approaching the empirical characterization of the space of capabilities is to clearly differentiate between active and passive behaviors. To acquire a particular capability should imply an increased ability to *act* (move/think) autonomously, in a particular way or set of ways, taking into account the learned characteristics of the external environment. A behavior which does not denote autonomy, but which reflects (open or covert) coercion, or which is induced by conditioning, is a passive behavior. Typically, a *passion* is a thought or behavior which has been induced by external impulses, without the conscious, reflexive involvement of the agent. Much of the consumption activities of the affluent, for example, are the result of non-reflexive, automatic response to different forms of conditioning and manipulation. The same type of problems of spurious choice appears in the making of political power.¹⁴

We are then concerned with the specification of *actions* — i.e. *not* passions — which express the acquisition of capabilities reflecting the all-round development of individuals. In other

¹³ These passions have been interpreted as a neurotic complex within the psychoanalytic *anal character* structure (see works by Freud, Ferenczi, Abraham and others in Borneman 1976). *Parigraha* is an old equivalent in Indian traditional philosophy.

¹⁴ There is for instance a whole series of experimental results on *priming effects*, i.e. behaviors that have been induced in the agent without her being conscious of it. “Studies of priming effects have yielded discoveries that threaten our self-image as conscious and autonomous authors of our judgments and our choices.” (Kahneman 2012, p. 55)

words, the multidimensional human capability space should account for every conceivable dimension of human activity.

Section X.

A natural place to start a preliminary inspection of the capability space is the set of *basic needs*. Needs are of course not capabilities, but the ability of individuals to provide for their basic needs could be called *basic capabilities*. There is a quite large literature on basic needs, investigating in great detail many relevant aspects of the *basic needs approach*, actively promoted by international organizations (particularly the International Labour Organization) in the 1970s and 1980s. Considered among the most basic human needs are food, water, shelter and clothing — expanded lists also include sanitation, education, and healthcare.

The basic needs approach refers to the most basic conditions for physical survival. More general theories of human need include *personal autonomy* as a human need as important as physical survival (Doyal and Gough, 1991). The achievement of personal autonomy would require more elaborated conditions than mere physical survival, such as a certain level of economic security, physical security, a non-hazardous environment (including the work environment), significant primary relationships, safe birth control and child-bearing, and security in childhood. Additional conditions refer to the political system, which should be open to democratic participation and to rational confrontation of ideas, communication and decision. All participants should have the needed knowledge and information to understand the essentials of the issues of the social debate.

Maslow's (1954) theory of the hierarchy of human needs offers an even larger account of human needs, in which basic physical survival needs form the base of the pyramid of needs. The stipulated physiological needs fundamental for survival of this strand of developmental psychology is more detailed than those of the basic needs approach. They are: breathing, food, water, sex, sleep, homeostasis, excretion. This more detailed list allows for introducing the discussion of basic *environmental capabilities*. Air pollution, for instance, impinges on the basic capability of normal, healthy breathing. Contamination by noise affects the capability of sleeping. The proliferation of toxic substances and other environmental stress factors restrain the capability of the organism for homeostasis — i.e. maintaining a viable physical equilibrium over time. Food and water can also of course be analysed from the environmental point of view — as also excretion, directly related to the capability of dwelling with good sanitary conditions.

It is interesting to see sex among the basic needs. In spite of its obvious and all-pervading presence in modern life and culture, sex is absent from most serious discussions of needs, capabilities and human fulfilment — not least from the economic point of view. (Although safe birth control in Doyal and Gough's analysis relates to this.) We will not be able either to develop here this fundamental and taboo-laden subject, but the action/passion dichotomy should give a first approximation from the capabilities' perspective towards a mature, active, egalitarian approach to human sexual/libidinal development.

The second level of the developmental pyramid of needs is given by security. A releasing feeling of trust in relation to: the body (personal security); to economic standards (employment, pensions), to health (absence of, or protection against, illness and accidents). The third level refers to the general feeling of love and belonging. In terms of capabilities, this would relate to the possibility of establishing ties of friendship and love at different levels and spheres of personal and social activity.

The fourth and fifth developmental levels refer to subjective feelings, such as self-esteem, self-respect, self-confidence and self-actualization. However, introspective evaluation cannot be a safe base for ordering socioeconomic states according to the idea of human development. As in the case of the current fad of “happiness economics,” attempts to give objective content and serious scientific status to so feebly based notions are fated to fail.¹⁵ In a severely alienated population, widely shared feelings of happiness and self-confidence may coexist with extended poverty, inequality and oppression. In an imaginary society of manic-depressive individuals, for instance, the probability of an individual declaring being “happy” would be 0.5, and the probability of reporting “unhappy” would be 0.5.

Human development should be understood as the expansion of the *objective capability space* of individuals. Increased objective capabilities would by themselves involve enlarged subjective self-esteem and self-actualization for increasing numbers of individuals. “Happiness,” as a subjective, self-centred, and potentially delusory feeling, I think is alien to the conception of human development.¹⁶

Section XI.

One may conjecture that the idea of a hierarchy of needs and capabilities, along with the possibility of obtaining objective measures for the different capabilities, could allow for the conception of what one may call a society’s *capability matrix*. In effect, the idea of a hierarchy of needs and capabilities, in which some basic categories of needs/capabilities are the precondition for the fulfilment of other, less basic, categories, which in turn are the preconditions for the fulfilment of other less basic categories (and so on), suggests the conception of (some) capabilities being the necessary “inputs” for the formation of (other) capabilities. If the advancement of capabilities is measurable, and if it is possible to ascertain the proportions in which different capabilities enter in the formation of any one of them, then it would in principle be possible to postulate the existence of a *capability matrix*. It should also be possible to empirically implement such a matrix, and even to integrate it within the framework of the Social Accounting Matrix (SAM). We will return to this in later on.

Section XII.

It is important to remark that most of the needs/capabilities discussed above are also human rights, according to the Universal Declaration of Human Rights of 1948, adhered to by all members of the United Nations. The universally recognised rights include the rights to:

- life and liberty,
- a standard of living adequate of health and wellbeing, including food and housing,
- social protection in times of need,
- the highest attainable standard of physical and mental health,
- work and just and favourable conditions of work,

¹⁵ Introspective evaluation of happiness can for instance be influenced by “priming” (Kahneman 2012, Ch. 38). “During the last ten years we have learned many new facts about happiness. But we have also learned that the word *happiness* does not have a simple meaning and should not be used as it does.” (Kahneman 2012, p. 407)

¹⁶ “Freedom,” “joy,” or “beatitude,” should come closer to what we can imagine of the feeling of de-alienated, self-conscious, free individuals, in free, self-conscious, and de-alienated societies.

- education and access to information,
- participate in the political process and in cultural life,
- physical integrity and security.

Among other universally consecrated freedoms are the freedoms of religion, opinion, speech and association, and the freedom from discrimination of any kind in the grounds of race, sex, language, religion, national or social origin or other status (see, e.g., www.ohchr.org).

Indeed, it would seem that in some sense, the United Nations' declaration of 1948 was remarkably bold, not only by giving the status of basic universal rights to an extended category of needs/capabilities, but also for going farther than later proposals by researchers and institutions. Particularly important for our discussion, and often neglected, even in rich countries, is the universal human right "to work and to just and favourable conditions of work." From a capability point of view — and, I think, from any other view putting the all-round development of individuals at the centre stage of human development — the world of work should take a central place and a special weight in the capability space. Work occupies most of the energy, time and engagement in the lives of most people. Work as *action*, as autonomous activity expressing the individual's creative power, is a most basic human capability. Work as passive, mechanical subjection to the productive apparatus as mere work-force, on the other hand, detracts from the possibility of human development. Unemployment also detracts from that possibility. So the work capability sphere should include the many dimensions that express autonomous participation and decision capacity at work, from the factory floor to the board of directors of firms and institutions, and even at the level of overall economic policy and planning. It should also include the multiplicity of talents developed at work, their variety and complexity, along with the possibility for workers to exert and develop different skills in all sectors of economic activity (e.g. by rotation among many different skills, including executive and political skills; cf. note 11 above). The work capability should even measure the capabilities for discovery, invention and innovation in all sectors.

The UN Declaration mentions the right to "participate in the political process and in cultural life." It is easy to see that the political sphere is decisive for the progress of de-alienation at the level of the whole society. One could say that de-alienation at the level of the material base of production (the world of work) goes hand in hand with the process of de-alienation at the level of the legal, institutional and political superstructure. De-alienation at the political level should imply the acquisition by individuals of the political capabilities necessary for exercising effective decision power at all levels. In a sense, political de-alienation could be seen as the progressive acquisition of self-consciousness by society itself. In this process, every organ, cell, molecule and atom of the social organism formally and effectively participates in the self-regulating process, from different perspectives that, as we saw above, are continuously changing.

How to measure the level of development of the different dimensions of the political capability space, or (what amounts to the same) how to measure the real advancement of democracy in the political system, is a difficult question. Basic measures of political capability should at least be: 1) the capability to advance political ideas, 2) the capability to represent and be represented, and 3) the capability to inform and be informed. Unconstrained flow of information and knowledge within the body politic and the social body in general — the cognitive transparency of the social mind, as to say — counteracts prejudice and uninformed

opinion, ensures coherence between socioeconomic structure and political system, and promotes steady enlargement of the capability space.¹⁷

The right to participate in cultural life of the UN Declaration can also be specified in a large manifold of different capability dimensions. All the arts, crafts and humanities, and also all forms of corporal development should be included — the development of corporal aptitudes such as plasticity and expressivity goes along with the expansion of body-awareness and intellectual capabilities of creative thought.

The expansion of the social capabilities of mutual caring and belonging, referred to within the third level of Maslow's developmental pyramid of needs/capabilities is, I think, a crucial aspect of the de-alienation process. The thrust of capitalism is to make of every individual an isolated producer and an isolated consumer. Isolated producers, alienated from each-other, form a docile, controllable work-force, from which maximal surplus-value can be extracted. Isolated consumers, under steady systemic conditioning and manipulation by publicity and propaganda, are the ideal type of alienated subjects. The thrust towards de-alienating development should involve the opposite movement, from isolation towards association, involving in particular the expansion of all kinds of associations and social organizations. In this way, the development of social capabilities becomes at same time the development of autonomous, free individuals. Human development is thus at the same time *individuation* or individual realization.

As the other areas of the capability space, the associational or social sphere admits many measurable dimensions. It is possible to measure participation in all kinds of associations or situations in which individuals actively meet without constraint or manipulation, from the neighbourhood and hobby-activity level, to the workplace and branch of activity, to higher levels of political, social, ecological, intellectual, religious, and other, interests.

Section XIII.

The above are but a few observations and conjectures about a few areas of capabilities relevant for human development economics and accounting. Similar reasoning can be applied to the rest of the conceivable capability space. I should like, however, to stop here with the inspection of that space, and to dedicate the rest of this essay to the problems of: 1) metrics (i.e., how to measure capabilities), 2) aggregation (how to form a synthetic measure from the multiplicity of capabilities), 3) structure (how to conceive a matrix of capabilities), and 4) integration (how to incorporate the matrix of capabilities within the framework of the SAM).

It seems to me that for the time being, the most viable way of constructing capability indicators is by way of comparison with a norm. The indicator varies between one (when it is equal to the norm) and zero. Many indicators admit one as the norm (e.g., per cent of population with access to water/sanitation, literacy rate, educational enrolment ratio, contraceptive prevalence). In a preliminary stage of implementation, most indicators could be expressed in the form "percent of the population that *can...*" For instance: "percent of the population that can swim."

¹⁷ We see here an echo of Doyal and Gough (1991), inspired in turn by the notion of the *ideal speech situation* of the rational polity (see Habermas 1984), in which participants are equals, with similar levels of informational grounding.

In other cases, the indicator could be obtained by comparison with the maximal or optimal level of achievement, locally or internationally (e.g., area of dwelling). This type of indicator should be adjusted for the degree of inequality (e.g. Gini) in the distribution of the attribute. What we are trying to measure is the general, egalitarian achievement of capabilities by individuals. For instance, more square meters of average dwelling area is positive only if not countered by increased inequality in dwelling.

Dozens of such indices — each of them potentially decomposable — may be conceived for every domain of human capability development. Many of them are already being collected by statistical institutes, governmental agencies and other organizations, from the local to the global level.¹⁸

Section XIV.

It is very difficult to conceive an *a priori* well founded way of giving different weights to different indicators. This suggests that indicators should have similar levels of relevance. Given similar levels of relevance for all indices, the most direct method of index aggregation is by simply averaging. The simple average of all particular indices would then give the human development indicator for the whole society. It would be analytically interesting to also have different indices for different areas of human achievement (health, work conditions, empowerment, etc).

The idea of averages and indexes for whole societies is appealing for its synthesising power and public impact. It can however be insufficient, and misleading in some cases. However, present day communication and processing capabilities allow in principle for users to access data on line at every level of detail, and to demand virtually any kind of process and presentation.

Section XV.

Let us now enter the notion of *capability matrix*, and its possible adjunction to the general framework of social accounting. As said before, capabilities can be conceived as being interrelated within a hierarchical structure. Higher level capabilities require the achievement of lower level capabilities — to be able to write a novel, one needs to be able to nourish oneself, to read and write, perhaps to have gone through some higher schooling or writers' workshop, and so on. To “produce” so and so much of novel writing capabilities, you need so and so much of nourishing, reading, writing, training, and so on. That is, we are thinking now of *quantities* of capabilities — not capability indexes — materially expressed in some way, for instance in the number of novels written or published.

Capabilities are thus produced by means of capabilities. In the production of every capability intervenes at least one other capability. Every capability is contributing to the production of at least one other capability. This reminds of the transactions table of input-output and social accounting, in which each column details the amount purchased by the activity sector from the other sectors, and where each file details the sales of the sector to the other activity sectors. In the case of capabilities, this type of table may by analogy be called capability transaction table, or *capability transformation table*.

¹⁸ One may even speculate about a positive use for the advanced techniques now being employed for surveillance and espionage.

Also as in the input-output framework, it is possible to conceive a matrix of capability coefficients, or *capability matrix*. By analogy with the input-output or technical coefficients matrix, capability matrix \aleph (an $n \times n$ matrix) is the matrix of capability coefficients \aleph_{ij} representing the proportion in which capability i contributes to the production of capability j .¹⁹ Column totals are thus equal to one.

By analogy with dynamic input-output analysis, or also with Marxian reproduction theory (Bródy 1970), we can ask about possible balanced capability growth paths. Given the capability matrix \aleph , we can ask for the capability n -vector x and the growth rate λ consistent with \aleph :

$$\aleph x = \lambda x, \tag{1}$$

that is, we search for a vector x of capabilities, growing at rate λ (a scalar), and consistent with the proportions inherent in the overall structure of capabilities given by matrix \aleph . The corresponding *eigenequation* may be expressed as:

$$\lambda x - \aleph x = (\lambda I - \aleph) x = 0, \tag{2}$$

in which I denotes the identity matrix. The *eigenvalues* of this equation are those values λ , that make the determinant of the matrix $(\lambda I - \aleph)$ singular.²⁰ The solution of this equation for x gives balanced or equilibrium capability proportions that allow for growth in every sector at rate λ .

It is possible that the above reasoning may give rise to some objection. Eq. (1) states necessary conditions for balanced capability growth, but does not include any economic mechanism that may make that growth possible in the first place. This would appear to make capability growth an exogenously determined, unexplained process, as is the case with the neo-classical growth model (in which, within the framework of an aggregate production function, growth is ultimately explained by an exogenously given rate of technological progress).

The realism of the model may be increased, in answer to this objection, incorporating a causal link between growth and investment, as in the dynamic version of the input-output model. The growth of capabilities requires/implies the dedication of a particular kind of capability-increasing capabilities to the production of capabilities. There exist particular types of capabilities (e.g. scientific, technological, cultural, etc.) which are crucial inputs for the growth of other capabilities. These constitute kinds of “capital capabilities,” capable of being accumulated within social institutions, networks, and the like. We can postulate a \beth (beth)

¹⁹ \aleph (aleph) is an appropriate symbol to denote the matrix of capabilities. Since Georg Cantor, \aleph is associated with infinite sets. One may say that while GDP growth has definite (environmental and other) limits, the possible reach of human capabilities has in principle no limits. It may be worthy of remark that both capabilities and Cantor’s transfinite numbers have Spinozan roots. On the Spinozan roots of the idea of human development as capability development, see Buzaglo (2003). On the transfinite, see Ferreirós (1999, p. 130): “Cantor was fond of philosophy and theology, and he was particularly interested in the philosophy of Spinoza, which ascribes a central role to the idea of absolute infinity. This may have been one of the reasons why he showed an interest in expanding the domain of mathematics beyond the infinite.” Capabilities might be the way for economics to approach “Cantor’s paradise.” Once we enter, as David Hilbert said, “No one shall be able to drive us from the paradise that Cantor created for us.” (Hilbert 1926, translation quoted from Ferreirós, 1999, p. 365.)

²⁰ $\text{Det}(\lambda I - \aleph) = 0$ is an equation of degree n in λ , with n , not necessarily distinct, roots, associated with their respective *eigenvectors*. See e.g. “eigenvalues and eigenvectors,” Wikipedia.

matrix, a $(n \times n)$ matrix whose coefficients indicate the quantity of capability i which must be invested in capability j in order to increase capability j by one unit in the next period.

To introduce the causal equation of capability growth, let us first write the equation of the stationary state of no growth. Capabilities are reproduced at a same constant level when λ in eq. (1) is equal to one:

$$\aleph x = x \tag{3}$$

Now, capability expansion above the stationary level would require investing in the creation of capabilities. To the level of constant capabilities expressed in eq. (3) must be added the amount of capabilities needed to achieve a λ rate of growth:

$$\aleph x + \lambda \beth x = x, \tag{4}$$

in which the expression $\beth x$ represents the capability-increasing effects of “capability investments.” The new *eigenequation* is thus:

$$[1/\lambda - (1 - \aleph)^{-1} \beth] x = 0 \tag{5}$$

As in the previous case of eq. (2), the solution of eq. (5) for x gives balanced or equilibrium capability proportions that allow for growth in every sector at rate λ .

The second possible objection to the realism of the above analysis is that uniform, balanced growth in all sectors may per se not be a desideratum. Within certain limits, excess or lack of particular capabilities might be acceptable. This would suggest that in certain circumstances a simulation approach could be adopted. Instead of looking for the general and abstract balanced growth rates inherent in the static and dynamic characteristics of capability structures, a more applicable and policy-oriented model should trace the effects over time of different capability expansion strategies. Different priority structures for capability investment over time would give different capability growth patterns over time. Given initial capabilities and other initial conditions of the economy, given production and distribution structures (including capability matrices), and given the sequence of investment and other policies, such a capability growth model could be solved recursively (simulated) over time. The resulting growth patterns may include (positive and negative) excess capabilities (capability “imports” and “exports”), and also balanced growth — or any other desirable pattern. All this would of course demand a more complete knowledge of the entire socioeconomic structure, of the type provided by the SAM, which is the object of the following section.

Section XVI.

Now, would it be possible to introduce the above capability accounts within the wider social accounting framework?

The SAM registers transactions in terms of money units, while capability accounts are given in heterogeneous physical units. This is at first sight an insurmountable obstacle. Theoretically, however, it is possible to think about all entries of the SAM not in money terms, but in time units, that is, of social accounts implemented in terms of the labor theory of value. As far as I know, there are no empirical implementations of social accounts in time units.

There is also the additional problem of translating physical capabilities in terms of time used in their acquisition and exertion.

A possible solution could be to include capabilities within the SAM framework without their adding to the entries given in money terms. Let us explain the idea with the help of an example. Table 1 shows how the capability transformation table might be introduced within the framework of the SAM.²¹

Table 1. The Capability Table within the SAM framework

	1. Activities	2. Commodities	3. Capabilities	4. Private sector	5. Public sector	6. External sector	7. Investment	8. Total
1. Activities		Gross outputs	(Capabilities in production)					Gross outputs
2. Commodities	Intermediate demand		(Capability creating outputs)	Private consumption	Public consumption	Exports	Investment demands	Total demand
3. Capabilities			Capability transformation table		(Capability creation)	(Capability creation)	(Capability creation)	(Total capabilities)
4. Private sector	Value added		(Capability distribution)		Social transfers			Private sector income
5. Public sector		Sales taxes		Direct taxes		Foreign grants and loans		Public sector income
6. External Sector		Imports	(Capability creation)					Foreign exchange outflow
7. Savings				Private sector savings	Public sector savings	External savings		Total savings
8. Total	Gross outputs	Total supply	(Total capabilities)	Private spending	Public expenditure	Foreign exchange inflow	Total investment spending	

In addition to the usual rows and columns of the SAM, our example introduces row and column 3, corresponding to capabilities. Capabilities interact with economic accounts for (1) activities, (2) commodities, (4) private sector, (5) public sector, (6) external sector, and (7) investment. The entry in row 3, column 3 is the capability transformation table given in physical units, referred to above.

Being the SAM given in money units, and being row 3 and column 3 given in physical units, this row and column cannot add to the SAM. Row 3 and column 3 are kept in a sense external to the SAM, not adding to the rest of the table (and its figures put in brackets), but providing crucial information from the point of view of human development.

²¹ A detailed description and explanation of the SAM accounts can be found, e.g., in Taylor (2004, Ch. 1). A didactic introduction is Breisinger *et al.* (2009). Simplified SAMs with detailed income distribution representations are developed in Buzaglo (1984, Ch. 4) and Buzaglo and Calzadilla (2008), which includes income distributions by income size and social class.

The intersection of the activity row 1 with capability column 3 would describe the level of capability development in the world of work. That is how different production sectors make use and develop the productive and creative capabilities of workers.

- Row 2, column 3 depicts the material inputs, goods and services necessary for the achievement of the attained level of capabilities.
- Row 3, column 5 shows how the public sector contributes to the production of goods and services used in capability production.
- Row 4, column 3 describes the capability levels attained by the different income groups or classes, i.e. the distribution of capabilities.

It would be also possible to include estimations of how much consumption, import and export activities, and particularly, sectoral investments contribute to capability development (rows and columns 4, 6 and 7).

Section XVII. Conclusion

The approach of conventional economics is not a useful tool for describing and understanding human economic behavior. Real world economics — including in it Marxian, Keynesian and structuralist economics — is a better point of departure for understanding existing economic systems, and for assessing their improvement. This tradition was instrumental in developing the framework of social accounting, with a focus on the distribution of income among the different social classes.

The classical focus on distribution was lost in the ulterior development of social accounting, which concentrated on national might instead, and was directed toward formulating national income accounts in a way useful to war financing.

The approach of human development accounting should be totally different from the approach of national accounting. Human development accounting should not try to correct or adjust in different ways the measures of national might. Human development accounting should have a totally different and more ambitious orientation. Human development accounting should reflect *human flourishing*, the flourishing of individuals and societies.

Human flourishing, the all-round development of individuals, can be understood as the process of expanding moral strength. Moral strength, fortitude and generosity are built by exploring, exercising and strengthening every dimension of the human endeavour, i.e. every *capability*. Individuals with developed personalities are (morally) strong individuals, able to naturally function and flourish in an environment of expanded commons — a society of equals, largely based on common management and common ownership.

A first inspection of the space of capabilities can start with basic capabilities, that is, capabilities to satisfy basic needs. Several of the most basic capabilities are human rights sanctioned by the UN.

Needs and capabilities can be seen as forming a hierarchy, in which some (more basic) capabilities are necessary for the achievement of (less basic) capabilities. This can be represented by means of a matricial structure, an \aleph capability matrix, with inherent potential rates of growth and implicit capability proportions for balanced growth.

It is possible to incorporate, albeit somewhat artificially, the capability transformation table within the standard framework of the social accounting matrix (SAM). This allows for computing important information, such as capability exertion at work, sectoral outputs and public services necessary for capability production, and capability levels attained by the different income groups and classes, i.e. the distribution of capabilities.

References

Baumol, W., 2000, "Leontief's Great Leap Forward: Beyond Quesnay, Marx and von Bortkiewicz," *Economic Systems Research* 12, 141-52.

Blackwell, K., 1985, *The Spinozistic ethics of Bertrand Russell*, Allen & Unwin, London.

Borneman, E. (ed.), 1976, *The psychoanalysis of money*, Urizen Books, New York.

Bortkiewicz, L.v., 1998 [1907], "On the Correction of Marx's Fundamental Theoretical Construction in the Third Volume of *Capital*," in H. Kurz, E. Dietzenbacher and Ch. Lager (eds.), *Input-Output Analysis*, Elgar, Cheltenham/Northampton.

Breisinger, C., M. Thomas and J. Thurlow, 2009, *Social accounting matrices and multiplier analysis: An introduction with exercises*, International Food Policy Research Institute, Washington.

Bródy, A., 1970, *Proportions, Prices and Planning. A Mathematical Restatement of the Labour Theory of Value*, North-Holland, Amsterdam.

Buzaglo, J., 1984, *Planning the Mexican Economy: Alternative Development Strategies*, Croom Helm, London/ St. Martins Press, New York.

Buzaglo, J., 2003, "Capabilities: From Spinoza to Sen and Beyond. Part I: Spinoza's Theory of Capabilities," *Post Autistic Economic Review*, Issue no. 20. "Part II: A Spinoza-Sen Economics Research Program," *Post Autistic Economic Review*, Issue no. 21. Reprinted in: E. Fullbrooke (ed.), 2007, *Real world economics: a post-autistic economics reader*, London, Anthem.

Buzaglo, J. and A. Calzadilla, 2008, "Simulating extended reproduction: Poverty reduction and class dynamics in Bolivia," Conference on Developing Quantitative Marxism, University of Bristol. (<http://www.paecon.net/workingpapers/BuzagloCalzadilla.pdf>)

Davies, R.W. and S. Wheatcroft (eds.), 1985, *Materials for a Balance of the National Economy of the USSR for 1928-1930*, Cambridge University Press, Cambridge.

Doyal, L. and I. Gough, 1991, *A Theory of Human Need*, Macmillan, Basingstoke.

Ferreirós, J., 1999, *Labyrinth of Thought. A History of Set Theory and Its Role in Modern Mathematics*, Birkhäuser Verlag, Basel.

Habermas, J., 1984, *The Theory of Communicative Action*, Polity Press, Cambridge.

Hilbert, D., 1926, "Über das Unendliche," *Mathematische Annalen* 95, 367-92.

Jasny, N., 1972, *Soviet economists of the twenties. Names to be remembered*, Cambridge University Press, Cambridge.

Kahneman, D., 2012, *Thinking, Fast and Slow*, Penguin, London.

Kurz, H.D. and N. Salvadori, 2000, "Classical Roots of Input-Output Analysis: A Short Account of its Long Prehistory," *Economic Systems Research* 12, 153-79.

Kuznets, S., 1942, "Uses of National Income in Peace and War," Occasional Paper 6, National Bureau of Economic Research, New York.

Lange, O., 1969, *Theory of Reproduction and Accumulation*, Pergamon, Oxford.

Leontief, W., 1964 [1925], "The Balance of the Economy of the USSR," in: N. Spulber (ed.), *Foundations of Soviet Strategy for Economic Growth*, Indiana University Press, Bloomington, Indiana.

Marx, K., 1968 [1863], *Theories of Surplus Value*, Progress Publishers, Moscow /Lawrence & Wishart, London.

Marx, K., 2004 [1844], "Economic and Philosophical Manuscripts" (transl. T. B. Bottomore), in: E. Fromm, *Marx's Concept of Man*, Continuum, London.

Marx, K. and F. Engels, 1976 [1845-1846], The German Ideology, vol. 5 in: *Marx-Engels Collected Works*, Progress Publishers, Moscow /Lawrence & Wishart, London.

Maslow, A., 1954, *Motivation and personality*, Harper, New York.

Nussbaum, M., 2011, *Creating capabilities: the human development approach*, Harvard University Press, Cambridge, Mass.

Petty, W., 1899 [1662], *The Economic Writings of Sir William Petty, vol. 1*, Cambridge University Press, Cambridge.

Robinson, J., 1976, "Michal Kalecki: A Neglected Prophet," *The New York Review of Books*, March 4.
Sen, A., 1985, *Commodities and Capabilities*, Oxford University Press, Oxford.

Sen, A., 1988, "The Concept of Development," in H. Chenery and T.N. Srinivasan (eds.), *Handbook of Development Economics – Volume I*, North Holland, Amsterdam.

Spulber, N. and K. Dadkhah, 1975, "The Pioneering Stage in Input-Output Economics: The Soviet National Economic Balance 1923-24, After Fifty Years," *The Review of Economics and Statistics* 57, 27-34.

Stone, R., 1986, "Nobel Memorial Lecture 1984: The Accounts of Society," *Journal of Applied Econometrics* 1, 5-28.

Taylor, L., 2004, *Reconstructing Macroeconomics: Structuralist Proposals and Critiques of the Mainstream*, Harvard University Press, Cambridge, Mass. and London.

UK, 1941, An Analysis of the Sources of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940, H.M.S.O., London.

UNDP (United Nations Development Programme), 1990, Human Development Report 1990 - Concept and Measurement of Human Development, New York.

University of Cambridge, Department of Applied Economics, 1962-1972, *A programme for growth*, 12 vols., Chapman and Hall, London.

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