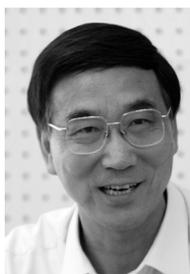


ESTABLISHING THE “GROSS DOMESTIC PRODUCT OF WELFARE”

A MAJOR REVISION OF GDP FOR A BETTER ACCOUNTING SYSTEM

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Abstract: Gross Domestic Product (GDP) has long been the most widely used measure of the national economy. The pursuit of economic growth exacts too high a toll in every country. Therefore, it is theoretically and practically significant to propose and establish a new index to measure the growth of national welfare—the “Gross Domestic Product of Welfare” (GDPW).

Key words: GDP; GDPW; scientific development

1. Being “People Centered” Is the Value Orientation of Scientific Development

The traditional view of development is materialist. It aims only at economic growth, reducing social development to economic development and economic development to economic growth, and manifesting itself in a Gross Domestic Product (GDP)-first mindset which takes GDP as the only benchmark for measuring officials’ performance. However, one-sided pursuit of GDP growth inevitably makes people taste the bitter fruit of growth without development or even growth with negative development, resulting in a serious dissonance between GDP growth and quality of life. From the perspective of value theory, material things are not all there is to human development, let alone being the ultimate goal

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of human society. One fatal flaw in the traditional view of development is that it is only concerned with the speed of development and is indifferent to issues such as goals, values, and justice—the questions of “development for what?” and “what is good development?” This concept of development demonstrates the excessive expansion of instrumental rationality at the expense of value rationality. The scientific outlook on development was put forward as a positive response to the lack of value rationality in traditional views of development. Its basic content is to uphold the people-oriented approach and promote the overall development of the economy, society, and humanity by establishing a comprehensive, coordinated, and sustainable view of development. It is evident that scientific economic development necessarily adheres to the approach of putting people first. This proposition means that economic development must focus on the full development of man and on an improved quality of life. Economic development should ultimately manifest itself in improving the quality of material and spiritual life and in an equitable process of economic development and distribution structure. The ultimate aims it pursues—“the people-oriented approach” and “the full development of man”—embody the ultimate concerns of value rationality. Seen against the course of the value orientation of human development, it is a “great leap ahead in values.”

2. Flaws in the GDP Accounting System

The scientific development outlook, as reflected in the economy, aims to enhance people’s welfare through the development of the national economy. The realization of value orientation in scientific development relies on having a scientific system of national economic accounting. Due to various flaws in current GDP accounting, the present system cannot assume this responsibility. In terms of accounting practice, these flaws are reflected in the following ways.

First, the system of national accounts (SNA) represented by GDP calculates only the direct result of market economic activities, ignoring many other aspects that are very important to people’s welfare. Although the result of market economic activities is an important part of economic welfare, it is far from exhausting the whole content of economic welfare or welfare as a whole. For instance, due to the fact that they are not conducted through the market, the value of the end products and labor of household economic activities or services performed for oneself is not calculated in GDP; nor is the value of non-standard production activities aimed at tax evasion or avoidance, even when their products are legal and contribute to the welfare of the society.

Second, GDP can only reflect the “quantity” dimension of growth, leaving out its “quality.” GDP only measures the sum of products and services in economic transactions and assumes that any monetary transaction “increases” social welfare,

without identifying whether the results actually increase or decrease national welfare. For instance, "illegal production" (sex services, narcotics production and transactions, etc.) is implicitly embedded in GDP. Therefore, GDP does not truly reflect harm to the national welfare.

Third, GDP reflects the "flows" but not the "stocks" of economic growth. This encourages people in unwise behavior such as pursuing incremental growth at the expense of stocks, leading to the bizarre idea that disasters, accidents, etc., are conducive to economic growth, an idea which constitutes the root of the ridiculous theory that "destruction creates demand."

Fourth, the SNA accounting index represented by GDP does not reflect external costs or benefits that do not have monetary charge attached (such as pollution and hazardous work environments). Since the current market system omits many resource and environmental factors, people tend to waste resources or overexploit them due to the lack of hard constraints arising from the absence of ownership and prices for resources. Besides, it is not possible to clearly identify or personify the source of responsibility for environmental pollution. All these factors make it impossible for GDP to reflect external cost and benefits.

Fifth, the general principle behind the estimation of GDP is the actual exchange value, which embodies various market failures; this differs from the price determined under perfect competition in economic theory. For instance, the actual exchange value under a monopoly is the monopoly price. Social welfare experiences "deadweight" losses in a monopoly market, but because GDP uses actual exchange value, it cannot reflect such losses, whence its overestimation of actual social welfare.

Taking into account the shortcomings of the SNA represented by GDP for measuring welfare, two US professors—William Nordhaus and James Tobin (1972)—realized the inadequacy of the traditional accounting indicators from the point of view of economic welfare as early as the 1970s and put forward the concept of "Measure of Economic Welfare" (MEW) as a replacement for Gross National Product (GNP). At the same time, on the basis of their research, Samuelson and Nordhaus (1989) further proposed a "Net Economic Welfare" (NEW) index to replace GNP. The three ushered in the study of national welfare accounting. Following their lead, a number of other scholars have also put forward accounting indices, such as the Index of Sustainable Economic Welfare (ISEW; Daly and Cobb 1989), the Genuine Progress Indicator (GPI; Hamilton 1999), Gross National Happiness (GNH), Gross National Cool (GNC; McGray 2002), etc. However, as a substitute for the traditional accounting index, all of these are immature in terms of economic theory and infeasible in reality. Since using GDP and other indices produces grave defects and distortions in the measurement of the economic value goals of the scientific mode of development, it is necessary to scientifically revise

GDP using a new mind-set and a new methodology to make it accord with the requirements of the economic value goals of scientific development.

3. Establishing the Gross Domestic Product of Welfare (GDPW) Accounting System

Drawing on previous research results as well as on practical needs, we put forward here a new accounting index—GDPW. The construction of GDPW is a new research project which requires us to establish our own framework and form a scientific theoretical system according to a scientific research paradigm.

3.1. The Conceptual Structure of GDPW Accounting

Like any other research framework, the GDPW framework has quite a complex conceptual structure. It includes basic categories reflecting the nature of the research topics and auxiliary categories associated with them. Specifically it includes the following categories:

3.1.1. Definition of Welfare

It can be seen from definitions provided within China and abroad that there are subjective and objective concepts of welfare. Subjective welfare refers to the subjective evaluation of an object's utility, that is, it is a description of the subject's preferences with regard to the object's utility. Unlike subjective welfare, the content of objective welfare is ambiguous although many scholars have used the term technically. It can be defined as objective items that have a practical benefit for individuals. From the angle of economics, if objects are useful to subjects, they have use value. Objective welfare depicts the value of objects to subjects, that is, the fact that objects provide subjects with benefits. In term of value theory, objective welfare is based on the objective value theory of Marxism while subjective welfare is based on the Western economic theory of subjective utility. Thus, the two are innately different. One involves subjective evaluation by individuals while the other involves objective items independent of subjective evaluations. Rigorously distinguishing the two concepts of welfare is the prerequisite for establishing a rational framework for GDPW accounting, a form of accounting that reflects and depicts welfare phenomena at the macrolevel. Thus, it is objective rather than subjective welfare that GDPW examines.

This article is based on the following understanding. First, the GDPW accounting based on the concept of objective welfare has the same framework as GDP accounting. Both explore objective goods and services. The difference between them lies in their perspectives. GDP calculation examines objective things from the perspective of production, while GDPW examines them from

the perspective of whether they promote practical benefits for members of the society. Therefore, the former represents nominal GDPW and the latter represents real GDPW. Specifically, GDPW indicators include not only those positive and negative utilities (positive and negative welfare) created during the production process that are covered by GDP but also those created in the same processes but not covered by GDP.

Second, like the original GDP accounting framework, GDPW accounting functions as a basic tool of macrocoordination, but it adds other functions that GDP accounting does not have. It is not a purely economic accounting system, but includes accounting for the natural and social environment, which helps reflect the quantitative relations of production, environmental, and social systems. Clearly, this is of great significance for the formulation of scientific development policies.

3.1.2. Definition of GDPW

GDPW refers to the gross welfare created by the production and operation activities of all economic entities at a given time. As designed, GDPW combines all the positive and negative utilities produced by the economic, natural, and social systems in an alternative idea of modernization. Inherently, what it reflects is objective welfare. As an index of the welfare created by people's life activities, it is able to effectively supplement and correct the defects and shortcomings of GDP. The reasons we use the term GDPW, rather than "domestic economic welfare," "economic net welfare," "net economic welfare," and "sustainable economic welfare" are outlined below.

First, in terms of research objectives, GDP is the key index for gross economic accounting while GDPW is an index targeting the deficiencies in GDP in terms of welfare and correcting them from a welfare perspective. The GDPW concept has an inherent consistency with GDP and embodies the value goal of national economic development; that is to say, the aim of national economic growth is to raise the standard of national welfare. GDPW best fulfills this research goal.

Second, in terms of the topic of our research, indices such as National Economic Welfare and Economic Net Welfare have revised GDP in a way that leaves out its intrinsic functions. As a common macroeconomic index in today's world, GDP has the advantage of being easy to calculate and comprehensive despite its congenital defects and disadvantages. GDPW is a revision that preserves the intrinsic functions of GDP and is therefore more readily applicable than National Economic Welfare, Economic Net Welfare, etc.

Third, in terms of research choices, even though using net value appears to be more scientific than using gross value, under the actual conditions of statistical calculation, use of net value in calculating depreciation of fixed assets remains

quite subjective. For this reason, GDPW is a more rational choice than the net value of domestic production.

Last, in terms of research content, GDPW comprises value accounting for the positive and negative welfare values of internal production, negative externalities, etc. The latter includes natural resource/environmental and societal costs. Although these two types of cost are not categories of the national economy, the definition of cost here is based on Marx's theory of reproduction and uses the concept of loss remediation, that is, the necessary cost of the products needed to make good losses—loss of welfare. Thus, GDPW establishes a link between GDP and environmental and societal costs, internalizing the externalities and achieving an organic unity by preserving the intrinsic functions of GDP while maintaining GDPW's function of measuring welfare. Other indices fail to show the internal linkage between production and those elements that affect GDP, since they simply add and subtract these elements within GDP. Moreover, GDPW has enlarged the scope of GDP by calculating the positive and negative welfare values of internal production, thus enabling GDP to reflect the growth of national wealth and benefits in a more comprehensive and accurate way. In sum, GDPW is more scientific and more operable than the indices of National Economic Welfare, Economic Net Welfare, etc.

3.1.3. Definition of the Positive and Negative Welfare Values of Internal Production

These two concepts are important mediating variables for the shift from a GDP to a GDPW framework. The information on market transactions obtained by the state cannot cover all human production activities involving such transactions. Some activities that are clearly harmful to the society or affect the normal economic order, such as producing and dealing in drugs, pornography, illegal arms dealing, smuggling, prostitution, abduction and human trafficking, etc., are prohibited and hence go underground. These activities, which never appear in official statistics, have negative effects on social welfare and are therefore termed negative externalities. In addition, some economic activities that go underground to evade or avoid tax are also not included in the national accounts, but have a positive effect on national welfare in terms of the welfare value of their end products; hence we refer to them as positive externalities.

3.1.4. Definition of the Welfare Value of Negative Externalities

This is defined in terms of the economic theory of externalities and measures the external effects of the economy and society on the production of national welfare. It consists of two parts: costs to the natural resource environment and costs to society. Environmental costs are the effect of national economic externalities on the resource environment as a form of domestic wealth. Its main costs are resource

depletion and environmental degradation. Costs to society refer to expenses or losses resulting from social activities and factors such as social management and social security, with the latter including natural disasters, accidents, crimes, etc. Costs to society reflect the external effect of society on the economy and people's welfare. In essence, both costs to the natural resource environment and costs to society are externalities affecting and consuming welfare, hence we term them welfare values with negative externality.

3.2. Theoretical Basis of GDPW Accounting

Like many research frameworks that are supported by multiple theories rather than by one alone, the GDPW is also supported by a group of inter-related theories. Our research framework is essentially one that integrates man–the economy–the environment. Specifically, it is based on the framework of the traditional SNA, with the economic system as the topic of its investigation. On this basis, we incorporate the three major factors of people, resources, and environment in the GDPW framework in an organic combination forming a people-centered research framework. Compared with the traditional SNA framework, the research framework of GDPW has a very different content and scope. Therefore, in terms of establishing the GDPW framework, apart from Keynesian economic theory, the following economic theories further constitute our research basis.

First is the theory of the scientific outlook on development. GDPW is an accounting index put forward with a view to fitting the requirements of the scientific outlook on development. The key point of this outlook as put forward by China is development; its core is putting people first; its basic requirement is comprehensive coordination of sustainable development; and its principal method is making overall plans and taking all factors into consideration. It requires that the population, the economy, and the environment be combined in an organic unity and highlights the people-centered approach. Therefore, the important strategic thought of the scientific outlook on development necessarily becomes the principal theoretical basis for establishing the GDPW research framework.

Second is Pigovian welfare economics. The reason Pigovian welfare economics, especially the Pigovian theory of externalities, can serve as the theoretical basis for establishing the GDPW framework is primarily that, first, the GDPW is inherently a comprehensive index reflecting gross welfare instead of gross production; its research subject is basically consistent with that of welfare economics. Second, the theory of economic externalities takes the market economy as its point of departure for studying the impact on the market of factors outside the market economy. The GDPW framework is based on the traditional SNA framework of market activities, but by investigating the impact of external factors such as environment and resources, it transforms the purely economic GDP index into

the actual welfare index of the GDPW. It is thus clear that in terms of research content, the GDPW framework is congruent with that of the theory of economic externalities. Finally, according to the latter, the criterion for assessing whether an activity is external or internal is to find whether there is a difference between its macrocost and its microcost; this provides the theoretical basis and accounting principles for establishing the GDPW framework.

Third is the theory of environmental economics. The basic categories of environmental economics are the environment and natural resources, and it mainly studies the structure of and changes in people's natural environment and natural resources, ways of reducing environmental pollution and destruction in order to protect and rehabilitate the environment, the development of new energy and alternative energy technologies, etc. Today, when environmental protection is a high priority, environmental science also studies human activity, such as government action in relation to the environment, government environmental policies, and so on. Nowadays, many environmentalists believe that environmental consciousness should shift from ex-post compensation for environmental damage to ex-ante environmental protection and that people should study the conflict between the natural environment and the development of human society, especially modern sustainable development thinking and related theories that have emerged as a result of environmental problems. Among these are the "Three Pillars" theory of sustainable development advanced by Robinson and Tinker (1998), the "Ecology" theory of sustainable development put forward in Aniansson and Svedin (1990), and the "Capital" theory of sustainable development of Daly and Cobb (1989) and Pearce and Turner (1990). Environmental economic theories have played an important role in the formation of the GDPW accounting system and the definition of its accounting scope.

3.3. The Basic Framework of GDPW Accounting

3.3.1. Design Approach

GDPW is a new accounting index fitted to the requirements of the scientific outlook on development. The "hard core" of its research framework reflects the people-oriented thinking of the scientific outlook on development, that is, our research framework is constructed with a focus on putting people first, for the essence or ultimate goal of economic development lies in improving human welfare and promoting the free and full development of man. The GDPW framework is closely related to the GDP framework; it represents an improvement on GDP rather than being entirely separate from the current GDP framework. Therefore, we can use the current GDP research framework as a basis for introducing impact analysis of welfare improvement. By adjustments to the current GDP, we can

achieve consistency between the explicit data and the implicit welfare content, so as to establish a national economic accounting system suited to the economic value goals prescribed by scientific development. In addition, conceptually, the GDPW must also calculate the impact on welfare of external economic factors, such as environmental pollution. Consequently, its research scope involves not only the economic system but also the environmental and resource system, the social system, and so on, to compensate for the shortcomings of the current GDP framework. In this way, GDPW constitutes a research framework possessing both new functions and traditional GDP functions.

3.3.2. Accounting Equations

On the basis of the above design perspective, the following GDPW accounting equations can be established:

First, GDPW accounting equations do not take externalities into consideration. Using the production analysis approach, we get $\text{GDPW} = \text{current GDP} + \text{positive internal production welfare value}$; using the expenditure approach, we get $\text{GDPW} = \text{current GDP} - \text{negative internal production welfare value}$; and from a comprehensive perspective, we get $\text{GDPW} = \text{current GDP} + \text{positive internal production welfare value} - \text{negative internal production welfare value}$, of which $\text{positive internal production welfare value} = \text{non-standard production value} + \text{non-market production value}$, and $\text{negative internal production welfare value} = \text{total illegal production value}$. In making specific GDPW adjustments, we can use either the production approach or the expenditure approach to formulate the equations. For the purpose of facilitating analysis, we provide only an outline rather than a detailed description of the three types of calculation. What needs to be specially noted is that although both positive and negative internal production should be incorporated into the scope of GDPW accounting, only positive internal production creates welfare and is therefore included in the production approach; negative internal production (illegal production) creates negative welfare products. From the point of view of the expenditure approach, the positive internal production value has actually already been included in GDP; therefore, in expenditure accounting, the non-standard production welfare value should not be included in GDP to avoid double-counting, and the illegal production value should be deducted from GDP. At the same time, these methods of treatment are different from those of SNA (Commission of the European Communities et al. 1993), as SNA treats both non-standard production value and illegal production value as additional items of GDP.

Second, there exist GDPW accounting equations when externalities are taken into consideration. $\text{GDPW} = \text{current GDP} + \text{positive internal production welfare value} - \text{negative internal production welfare value} - \text{negative external welfare}$

value; negative external welfare value = natural resource environmental cost + social cost; social cost = social management cost + social security cost; social management cost = government social cost; government social cost = cost of erroneous government decisions + government corruption cost + government administrative failure cost; social security cost = cost of damage from natural disasters + cost of losses from accidents + cost of crime (see Table 1).

Table 1 GDPW Accounting Equations

<i>Accounting preconditions</i>	<i>Method</i>	<i>Formula</i>	<i>Notes</i>
1. Economic externality taken into account	Production approach	$GDPW = \text{current GDP} + \text{positive internal production welfare value}$	GDPW refers to the gross welfare created by the production and operation activities of all permanent economic entities within a country (or region) at a given time
	Expenditure approach	$GDPW = \text{current GDP} - \text{negative internal production welfare value}$	Positive internal production welfare value = non-standard production value + non-market production value
	Comprehensive approach	$GD2PW = \text{current GDP} + \text{positive internal production welfare value} - \text{negative internal production welfare value}$	Negative internal production welfare value = illegal production value
2. Economic externality not taken into account	Cost expenditure approach	$GDPW = \text{current GDP} + \text{positive internal production welfare value} - \text{negative internal production welfare value} - \text{negative external welfare value}$	Negative external welfare value = natural resource environmental cost + social cost; natural resource environmental cost = cost of natural resources depletion + cost of environmental degradation; social cost = social management cost + social security cost Government social cost = cost of erroneous government decisions + government corruption cost + government administrative failure cost; social security cost = cost of damage from natural disasters + cost of losses from accidents + cost of crime

Third, some notes. In understanding the above equations, the following aspects should be noted.

(1) The shift from current GDP to GDPW must follow three steps: first, adjustment of factors of production on the basis of welfare; second, adjustment of environmental factors on the basis of welfare; and third, adjustment of social factors on the basis of welfare.

(2) The significance of the adjustment of the factors of production is that, given that a large amount of negative welfare value has been incorporated in traditional GDP, it is necessary to deduct this value in the course of transforming GDP into GD2PW. At the same time, the positive welfare value not incorporated in traditional GDP should be incorporated in GD2PW.

(3) Positive internal production accounting: Positive internal production accounting covers the two major categories of informal and non-market production. Although informal production contravenes the relevant laws and regulations, it should be included in the scope of GDP accounting, since it has some degree of positive effect on people's welfare and national economic development. Because these forms of production themselves are omitted components of the national economy, the concept of internality should be applied. Non-market production encompasses a wide range of items including culture, education, sports, health, government services, housework, etc. While the products of many of these items are already included in GDP accounting, economic activities within the family and self-service activities, which make a definite objective contribution to society, are not but should be included in the scope of GDP accounting.

(4) Accounting for negative internal production (illegal production): Illegal production, also known as the criminal economy, is excluded from GDP accounting because it is highly elusive and presents great difficulties for accounting. But it is an objective economic phenomenon in the national economy and should not be omitted from GDP accounting just because it is difficult to detect, since GDP is supposed to fully and faithfully reflect the actual development of the national economy. Furthermore, there have been a large number of successful examples of accounting for illegal production within and outside China recently. We should learn from their experience and include this component in the accounting system of the national economy.

(5) Natural resource costs: It is an objective requirement of sustainable development that we deduct from GDP the cost of natural resources, including resource depletion and environmental degradation due to economic externalities. Resource depletion and environmental degradation are two extremely important categories among the various concepts in GDPW research, not only because they reveal the internal relationship between the economic system and the system of resource/environmental system in theoretical terms but also because, methodologically, they can be transformed into an indicator range, becoming an important mediating variable in the conversion of GDP into GDPW. Although resource depletion and environmental degradation appear to represent different phenomena, they are essentially the same: both represent tangible or intangible exhaustion of the environmental system caused by economic activities. From this point of view, they can be seen as the resource and environmental cost, or even production cost

(intermediate consumption), of economic activity. The conclusion that forms the premise of this theoretical understanding is that it is important to deduct resource depletion and environmental degradation from GDP for GDPW accounting when we shift from the current GDP to GDPW.

(6) Social cost: To simplify accounting, we have only accounted for two kinds of social cost. The reasons for deducting them from GDP are as follows. First, from the cost benefit point of view, losses caused by natural catastrophes, accidents, and social management are in fact costs generated during national economic development. Considering such losses as “costs” and deducting them from GDP will help establish a scientific perspective on the costs and benefits of economic development. Second, the concept of “cost” used above is not the same as the accounting term. Instead, it is defined as making good losses that have been sustained (including natural resource and environmental costs). That is to say, it stands for the consumption of those resources and assets necessary to make good the welfare losses caused by economic and social externalities and to return to the original level of welfare. Finally, in terms of welfare improvement, GDP could be used to account for increases in national production, while GDPW could be used to measure improvements to welfare brought about by national production. The aim of compensatory production is to make good the loss of welfare and maintain people’s normal welfare level. Since compensatory production is only an “intermediate input” in the process of national economic welfare production, rather than a final product, it should be a deduction in GDPW.

(7) The relevant formulae indicate that GDP calculations based on welfare levels only show nominal GDPW. Due to losses caused by both internal and external factors, the current external numerical value of GDP cannot truly reflect the quality of welfare embodied in it. The difference between the two results is due precisely to the coexistence of internal and external loss-causing factors. Thus, the monetary value of loss-causing internalities and externalities should be estimated and GDP should be adjusted on that basis, thus making the external numerical value of GDP coincide with the quality of welfare embodied in it. Here you have our theoretical explanation for the use of positive and negative internal production values and negative external welfare value as additions or deductions in GDPW accounting.

(8) After the adjustment, the welfare-based GDPW accounting system will be an integrated accounting index covering economics, accounting, environmental studies, and public administration. As it is an interdisciplinary research framework covering many disciplines, there will be some technical problems in its implementation due to the complexity of its theoretical content and research methodology. However, it remains a relatively optimal accounting index.

3.4. The Basic Principles of GDPW Accounting

3.4.1. *The Principle of Objective Welfare*

The objective welfare principle is the primary principle of GDPW accounting. It means that only objective outcomes which improve people's welfare and can be expressed in terms of monetary value will be included in GDPW accounting. In terms of welfare, GDPW must have a vehicle: national product. In general, national product refers to final social product. The famous French economist Léon Walras (1954) argued that the principle of utility should be the criterion for determining whether goods fall within the scope of the final product in national welfare accounting. That means if the outcome of an activity has the ability or effect of fulfilling certain needs, that outcome is useful and is thus part of the final social product. This criterion is generally accepted in accounting for production, allocation, and use in GDP. However, in research on GDP-based national welfare accounting, some scholars have raised two further criteria, that is, strong utility and weak utility. "Strong utility" means that as long as a certain product fulfills a need, it can be seen as useful regardless of whether it is moral or legal. The current SNA follows this criterion. In the SNA, all products and services that meet the needs of members of society, both general and individual, are included in the scope of final social product accounting. This includes even illegal economic production and immoral narcotics production. As explained in SNA (Commission of the European Communities et al. 1993), illegal actions that fit the characteristics of transactions—notably the characteristic that there is mutual agreement between the parties—are treated the same way as legal actions. The production or consumption of certain goods or services, such as narcotics, may be illegal but market transactions in such goods and services have to be recorded in the accounts.

However, some scholars studying welfare accounting in the national economy, such as Nordhaus and Tobin, disagree on the use of the strong utility criterion. Since national economic welfare is quite different from national production, whether the outcome of an economic activity should be regarded as a final social product and become an objective item in national economic welfare accounting is not solely dependent on its utility, but to a great extent on its capacity to improve people's welfare. This thinking on the outcome of economic activities was later summarized as the weak utility criterion in contrast with Walras' (1954) strong utility criterion.

So, which criterion should GDPW accounting adopt? GDPW has something in common with GDP in terms of content; the difference is that GDPW is a revision of GDP from the perspective of welfare. Production and welfare are two closely related concepts, with production being the precondition and welfare the result. GDP accounting and GDPW accounting are therefore not independent systems,

but form an organic whole. GDPW accounting is a revision of GDP accounting that is based on GDP accounting, so we should take into consideration the adjustment not only of external factors not included in GDP accounting but also of internal factors which are already included. Therefore, the scope of GDPW accounting in this article sticks to the following criterion: all goods and services that meet the needs of members of society, collectively or individually, should be brought within the scope of accounting for final social products. But production activities that are illegal or immoral and do not contribute to people's welfare should be deducted from GDP as having negative internal production welfare value under GDPW, since such final social goods and services have a bad effect, or at least not a good one, on society's welfare. In short, the scope of GDPW accounting is based on the legal and moral "standard of benefit."

3.4.2. *Principle of Subjectivity*

The active entity (subject) in GDPW accounting is the economic entity with an economic interest in the economic territory of a country. An enterprise or an individual can be identified as an entity with an economic interest if they have a locus (residence, factory, or other building) in the economic territory of that country and use it for long-term business activities. In an "individualistic" market system, such entities organize their economic behavior according to the "principle of minimization and maximization." The objects of minimization and maximization—costs and profits—are calculated with this "interest entity" as their boundary. In the presence of external factors, neither costs nor profits can accurately reflect the effect on society's welfare of various kinds of economic behavior. In a market system, costs and profits are expressed in the market price of goods and services. Specifically, the results of each entity's production—goods and services—cannot accurately reflect their effect on welfare. This explains the errors in GDP accounting when market value (price) is used to express the value of human production.

The question now is since externalities can be either positive or negative, and what one gains another loses, why are there still errors in the results of our calculations when we simply add up the cost (using the expenditure approach) and profit (using the income approach) of all economic entities? The explanation lies in selection of the subject, that is, the economic entity. Current GDP accounting obviously omits two subjects: one is the natural environment, the other our descendants. On one hand, the natural environment, as part of our living space, is a key element of human welfare; on the other, it plays an important role in human production activities. Unlike natural resources such as minerals and land, the environment tends to show the characteristics of a public good, that is, its consumption is non-excludable and non-rivalrous. Therefore, the "tragedy of the

commons" is particularly striking in circumstances of mismanagement. No market interest entity would take action to reduce the welfare loss caused by the ozone hole over Antarctica, since the profit from this kind of activity cannot make up for its huge cost given that the only outcome will be a public good. Although we can make a discounted calculation of the welfare of our descendants in theoretical research and then incorporate this into our current studies, this will not actually happen in reality. Given the fact that future generations have no say in the present market, they are unable to raise objections when their welfare is harmed by the negative externalities of this generation's behavior. Thus, the market pricing system is not able to reflect the costs incurred by the present generation but borne by future generations.

3.4.3. *The Quasi-Market Principle*

This principle requires that the economic quantities making up GDPW be of a commodity or quasi-commodity nature. Some would argue that the gross national economy should be of a purely market nature, that is to say, it must be able to conduct market transactions. This only sees part of the picture since it tends to exclude economic quantities that are of great economic significance but have a low level of marketization. The reason we adopt the quasi-market principle is that if we measured GDPW by purely market criteria, our calculation would be affected by the degree of marketization, which would mean that the statistical scope of the gross welfare of economic entities at different levels of development would be inconsistent. In addition, the quasi-market principle allows for a more comprehensive description of production welfare flows; their omission would make it impossible to fully explain a series of continued consumption behaviors by economic entities. To implement the quasi-market principle means reflecting gross market-based economic welfare, on one hand, and, on the other, assuming a market—a virtual market—for non-market economic activities. This "quasi-market" enables the flow of production welfare, with the flow corresponding to the quantity of market products. Two methods are normally adopted for this virtual market: one is to take the price of goods traded in the market as the value of similar nontradable virtual goods; the other is to take the expenditure and cost of production of such goods as the value of the virtual goods.

According to the quasi-market principle, the production activities covered by GDPW accounting can be summarized as follows: (1) production of goods and services provided or prepared for other economic entities, including production of goods and services consumed in the above process; (2) all goods in self-sufficient production that are used for the producer's final consumption and capital formation; (3) self-sufficient production of producer-owned housing services and household or individual services provided by unpaid family members.

In addition, GDPW accounting also observes the temporal principle, the principle of ownership rights, etc. All these criteria show that the scope of GDPW accounting is based on an objective concept of welfare and has very rich accounting content.

References

- Aniansson, B., and U. Svedin. 1990. *Towards an Ecologically Sustainable Economy: Report from a Policy Seminar*. Stockholm: Swedish Council for Planning and Co-ordination of Research.
- Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank. 1993. *System of National Accounts 1993*. New York: United Nations Publications.
- Daly, H. E., and J. B. Cobb. 1989. *For the Common Good: Redirecting the Economy toward Community, the Environment and a Sustainable Future*. Boston: Beacon Press.
- Hamilton, C. 1999. "The Genuine Progress Indicator: Methodological Developments and Results from Australia." *Ecological Economics* 30: 13–28.
- McGray, D. 2002. "Japan's Gross National Product of Coolness." *Foreign Policy*, May/June, 44–54.
- Nordhaus, W., and J. Tobin. 1972. *Is Growth Obsolete?* New York: Columbia University Press.
- Pearce, D. W., and R. K. Turner. 1990. *Economics of Natural Resources and the Environment*. Baltimore: Johns Hopkins University Press.
- Robinson, J., and J. Tinker. 1998. "Reconciling Ecological, Economic, and Social Imperatives: A New Conceptual Framework." In *Surviving Globalism: Social and Environmental Dimensions*, edited by T. Schrecker, 71–94. New York: St Martin's Press.
- Samuelson, P. A., and W. D. Nordhaus. 1989. *Economics*. New York: McGraw-Hill.
- Walras, L. 1954. *Element of Pure Economics*. Translated by W. Jaffe. London: Routledge.