GDP AS A MEASURE OF ECONOMIC GROWTH AND WELFARE: BRIEF CRITICAL ASSESSMENT

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Abstract:
The purpose of our paper is to briefly assess the role of GDP in measuring growth and welfare or in getting insight into the state of an economy. In this view, we propose a synthetic theoretical and historical review of national accounting, emphasizing the most important ideological underpinnings and theoretical suppositions of GDP for gauging economic growth and welfare. The paper includes: (a) a short historical review of national accounting; (b) a very brief reminder of the methods of measuring GDP; (c) an assessment of GDP’s ideological underpinnings; (d) shortcomings and limitations of GDP in measuring growth and welfare.

Key words: national accounting history, methods of measuring GDP, GDP as a measure of economic growth and welfare, ideological underpinnings of GDP statistic

JEL Classification: C10, E01
1. Introduction

In order to analyse and assess the state of an economy most of the policymakers and economic analysts rely on GDP statistics. But, as some of the most eminent statisticians and economists revealed, GDP is neither a value free measurement of an economy, nor an appropriate instrument of measuring economic growth and welfare. The purpose of the present paper is to synthesize some of the most important ideological underpinnings of early and modern national accounting and also to reveal the shortcomings and limitations of relying predominantly on GDP statistics in assessing the state of an economy.

2. National Accounting: Short Historical Review

Diane Coyle (2014) reminds us in her short but insightful book, *GDP – A Short but Affectionate History*, that both pre-modern and modern attempts to measure the whole of an economy occurred mostly in the context of wars, with the aim of assessing the countries’ resources “to fight a conflict and finance it through taxes”. Among national accounting early contributors are the British scientist William Petty, the statistician Gregory King, the British mercantilist economist Charles Davenant, the French finance minister Jacques Necker and many others. Thus, in the context of Second Anglo-Dutch War, which lasted from 1664 to 1667, William Petty calculated in 1665 “the income and expenditure, population, land, and other assets of England and Wales” aiming to estimate the available resources to finance wars through taxes and also to prove that the government could raise a much larger revenue from taxes both for peace and war needs. The work of William Petty was continued by Gregory King who was confidential advisor of British government and estimated how many years could be sustained a war, given the available resources of the country (Bos 2008, 14-15). Also, Charles Davenant in his Essay upon the Ways and Means of Supplying the War, published in 1665, made the same type of estimates and calculations regarding total income and total expenditures, looking for the best way to finance a war. He explained that a long term war cannot be borne without protecting trade and keeping low the impositions and taxes that discourage the commerce (Davenport, 1701). France lacked such estimates until 1781 when the finance minister Jacques Necker delivered his report to the king Louis XVI regarding the strength of the French economy (Coyle 2014, Chapter 1).

Marshall’s *Principles of Economics* was considered the first important modern contribution in accounting the national income. Following Marshall, many other researchers improved the collection of statistics and measurement of national income, such as Colin Clark in England and Simon Kuznets in United States. Throughout 1920s and 1930s, Colin Clark calculated national income and expenditure for the first time on a quarterly rather than annual basis, providing detailed splits of production and expenditure into different categories and publishing thorough accounts of the government’s finances. Clark studied also “how to adjust figures for inflation and also the distribution of income among different categories of people” (Coyle 2014, Chapter 1). In U.S., Simon Kuznets continued Colin Clark’s work applying the method developed by the British economist to the case of U.S. economy. Simon Kuznets was one of the economists that paid careful attention to the circumstances in which different statistics were gathered. He emphasized that welfare of a nation can scarcely be inferred from
the measurement of national income. Kuznets aimed to measure national economic welfare, emphasizing that “it would be of great value to have national income estimates that would remove from the total the elements which, from the standpoint of a more enlightened social philosophy than that of an acquisitive society represent dis-service rather than service” (Kuznets 1937). All expenses on armament, most of the outlays on advertising, expenses involved in financial and speculative activities, were considered by Kuznets as dis-services rather than services. Kuznets’ work of collecting data was very much cherished but his approach to GDP was not finally adopted. As Diane Coyle (2014) noted, Kuznets lost and real politick won: pre-war definitions of national income as well as Kuznets’s approach to GDP were abandoned or rejected because “they would show the economy shrinking if private output available for consumption declined, even if the government spending required for the war effort was expanding output elsewhere in the economy” (Coyle 2014, Chapter 1). Instead, it was preferred a definition of GDP that included all government purchases, including military purchasing, as part of national product. Kuznets criticized this method of GDP accounting, considering that it tautologically ensured that fiscal spending would increase measured economic growth, regardless of whether it actually improved individuals’ economic welfare (Kane 2012). This decision could rightly be considered a turning point in the approaches of national income measurement, given that there is a blatant difference between the ways that economy had been conceived in the early eighteenth century until the early twentieth century and modern conceptions.

Both early and modern approaches to national accounting had in common the fact that they were conceived mainly with the aim of estimating available resources to fight wars in a more efficient manner. The important difference is that early approaches to national accounting presupposed the idea that the economy was tantamount to private sector and that government interventions reduce rather than increase economic growth. Instead, in modern approaches to national accounting it is presupposed that government activities contribute to economic growth rather than reduce it and that fine tuning of the economy through fiscal and monetary policies is even necessary in this sense. Subtracting government expenditure on armament from national income, as suggested by Simon Kuznets, would reveal the huge sacrifice that wars involves and this was not politically acceptable at that time. Politicians looked for a method of measuring economic growth that could indicate the total capacity to produce of the country without showing that additional government expenditure on armaments reduces nation’s output. Therefore, the pre-war definitions of national income were abandoned precisely because they showed the economy shrinking when private output available for consumption declined. It was maintained that government spending required for the war effort expands economic output.

Moreover, the publication of Keynes’s General Theory of Employment, Interest and Money in 1936 paved the way for an increased role of government in fine tuning the economy through public policies. Relationships between different economic aggregates are at the heart of Keynesian macroeconomic theory, making demand management by governments’ policies to seem feasible and scientific. As Diane Coyle (2014, chapter 1) perceptively remarked, “GDP statistics and Keynesian macroeconomic policy were mutually reinforcing” and “the
story of GDP since 1940 is also the story of macroeconomics”. However, it remained a highly controversial issue, even for mainstream economists, that government purchases actually increase output, economic growth and welfare.

3. Methods of Measuring GDP

Before exposing some of the most pervasive criticism to GDP concept, in this section of the paper we will shortly explain how GDP is measured. There are three ways of measuring GDP: summing up all the output, all the expenditure and all the incomes in the economy. The expenditure approach is the most common method of measuring GDP and it is illustrated by the equation: GDP = C + I + G + (X – M), which means that GDP is equal to: consumer spending plus investment spending plus government spending plus exports minus imports (the trade surplus or deficit). The income approach reflects all the income earned and costs incurred in production and it is used to study the financial status of businesses. The value-added approach is used to analyse the industrial composition of output.

A simplified circular flow economic model is usually assumed (Fig.1), illustrating the interdependence of activities occurring in an economy: production of goods and services (the output of the economy), the income generated from the production of goods and services and the realized expenditures. The idea in the model is that all the corresponding flows have to balance. GDP derived as the sum of all final expenditures for goods and services spent by consumers have to equals the GDP derived as the sum of incomes earned from production, i.e. the sum earned by each entrepreneur in every stage of production. Moreover, the GDP measured in each of the above method have to equal the GDP derived as the value added or total output across all industries less intermediate products.

The three way of measuring GDP is usually illustrated (BEA 2014) using the model of a simple economy, with one final product realized in two or three stages of production (Fig.2)
and for simplification it is assumed that the product of third stage is produced using no intermediate goods.

<table>
<thead>
<tr>
<th>Stages of production</th>
<th>Intermediate product</th>
<th>Income</th>
<th>Total output (Sales)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 3</td>
<td>$0</td>
<td>$2</td>
<td>$2</td>
</tr>
<tr>
<td>Stage 2</td>
<td>$2</td>
<td>$3</td>
<td>$5</td>
</tr>
<tr>
<td>Stage 1</td>
<td>$5</td>
<td>$5</td>
<td>$10</td>
</tr>
<tr>
<td>Total</td>
<td>$7</td>
<td>$10</td>
<td>$17</td>
</tr>
</tbody>
</table>

Source: Authors’ example based on a common model of a simple economy used to illustrate GDP calculation (BEA 2014)

In the above model (Fig. 2), producers pays for the intermediate product and charge the producer in the next production stage with an amount of money representing the value-added by his own resources ($2 in Stage 1, $3 in Stage 2 and $5 in Stage 1). Therefore, total income is: $2+$3+$5=$10. The value of the final product ($10) is also the price paid by the consumer for the good he purchases. Total sales in the model illustrated above is $2+$5+$10=$17, but it is considered if all the sales of intermediate products were included, the aggregate value would overstate the value of production by double-counting or triple-counting intermediate products. For this reason, the value of total production is calculated by subtracting from total sales the value of intermediate products, which in Fig. 2 is $17-$7=$10.

All the methods of measuring GDP imply both theoretical and practical difficulties, especially when it is claimed that GDP measures growth and welfare in an economy. Some of these theoretical issues and practical difficulties will be summarized and illustrated in the next part of the paper.

4. GDP: Ideological Underpinnings

The national account history revealed the fact that national income definitions depended mostly on the political or military needs of the moment and also on the intellectual climate (Coyle 2014). The early definitions of national income changed over time and are not consistent with modern definitions in terms of coverage and methodology. Modern definitions of national income date back to 1930s and 1940s and are also influenced by what was considered important at that time politically and military in the context of Great Depression and World War II.

Observation and measurement rely on concepts and theories and in a more profound sense they cannot be value-free. Especially in social sciences, most of the concepts does not refer to concrete and tangible things, they are abstractions and for this reason they are even more dependent on peoples’ beliefs, purposes and values. In order to observe and measure growth, utility or welfare a specific set of values is implied and also specific conceptions about man and society are presupposed. Such conceptions and theories give finally the meaning of these concepts and constitute the basis of the value judgments and relevance judgments made by theorists.
Regarding the possibility of value free estimates of national income one of the most sceptical opinions is expressed by S. Kuznets:

"The statistician who supposes that he can make a purely objective estimate of national income, not influenced by preconceptions concerning the "facts" is deluding himself; for whenever he includes one item or excludes another he is implicitly accepting some standard of judgement, his own or that of the compiler of the data. There is no escaping this subjective element in the work, or freeing the results from its effects. In consequence, all national income estimates are appraisals of the end products of the economic system rather than colourless statements of fact; and, like all appraisals, they are predetermined by criteria that are at worst a matter of chance, at best a matter of deliberate choice." (Kuznets 1941, 3)

In estimating national account it is unconceivable to have no criteria of social productivity or to make no choices at least regarding price index. Strictly speaking, from the point of view of economic theory there is no unchallenged economic basis or value-free scientific view in devising an econometric instrument in order to assess the state of an economy. Therefore when one uses GDP or related statistics in order assess the economic growth or other economic aspects it is vital to understand the underlying scheme of values and all other presuppositions.

The development of econometric models completed the modern macroeconomic framework of analysis. In 1936, Dutch economist Jan Tinbergen (first winner of the Nobel Memorial Prize in Economic Science) was the first economist that developed a comprehensive macroeconomic model that was applied first in Netherland and then in US and UK (Coyle 2014, Chapter 1).

Relationships between different economic variables, such as that between interest rate and investment, consumer spending and income, government spending and GDP and so forth were estimated on the basis of econometric models and past averages. The underlying presupposition of such macroeconomic models is that economy is basically a sort of mechanism that can be fine-tuned or repaired by appropriate policy. Also another fundamental assumption is that there are stable and constant relationships between aggregate measures defined in national account. The spirit of social engineering and the mechanistic perspective on individual behaviour and social interactions gained more ground in social sciences (especially in economics) along with the advance of positivism in philosophy and epistemology. Positivism postulates that social sciences should follow the model of natural sciences employing the same methods of research, which means that they should be experimental, mathematical and quantitative. Methodological monism is nevertheless criticisable because the difference between the phenomena of social sciences and those of natural science requires different approaches (Mises 1990, 3-15).

As Diane Coyle (2014) did mentioned in her book in the chapter dedicated to GDP history, Bill Philips a British engineer and economist even built a machine (using a hydraulic model) in order to explain how British economy functions. Philips’ machine, which was presented in 1949 to London School of Economics, remained a museum piece, but the “engineering” mind-set is still present in the way most of mainstream economists think about economy and economic policies.
Econometric models are still widespread in economic science although they are now more complicated, taking into account new features of the economy and including also the influence of expectations about future between economic variables. The financial and economic crisis of 2008 raised important questions about the relevance of econometric model for economic reality as well as for their capacity to predict future evolutions in the economy. In real world, individuals do not encounter “the price level”, they have to deal with real prices of the commodities they buy and sell and it remains highly questionable that statistical aggregates using past data are really relevant for individuals acting on the real market.

The bottom line is that the statistics defined in national accounts as well as macroeconomic models that rely on them are not simply technical and value free elements. They are intertwined with particular epistemological and methodological conceptions, particular ideological positions and even political bias. For instance, as Diane Coyle observed, the macroeconomists’ assessment on the size of multiplier may be very much in line with their political sympathies: “Its [Multiplier’s] actual size is hotly contested among macroeconomists, especially in the context of the present political debate about how much “fiscal stimulus” the government should be applying to get the economy growing faster. There is an unsurprising alignment in the “multiplier wars” between macroeconomists’ answer to the technical question about the size of the multiplier and their political sympathies.” (Coyle 2014)

5. Does GDP Measure the Growth and Welfare?

Some of the conceptual problems and practical difficulties of measuring growth and welfare by GDP figures were already revealed by one of the main contributors to modern national accounts, Simon Kuznets. He noticed that if one intends to measure welfare and not simply output it is necessary to have a criterion regarding what brings services and what dis-services for people in a society and to subtract from the total the elements that bring dis-services rather than services. Kuznets sustained that there is necessary to subtract from present national income totals expenses on armaments, most of the outlays on advertising, most of the expenses involved in financial and speculative activities and so forth. Even if the list of expenses that Kuznets sustained that is necessary to be subtracted from the national income totals is debatable or questionable, Kuznets’ implicit objection remained valid and prefigured relatively more recent criticism of GDP as a measure of growth and welfare. For example, Oskar Morgenstern (1975) reopened the problem, criticizing the fact that anything that leads to a monetary transaction in monetary form is recorded as positive and enters GDP, no matter what is being sold (food, cars, drugs, atomic bombs). Another related trouble with GDP concept, according to Morgenstern is that it measures or expresses as positive the malfunctions of an economic system or disasters that may occur. Thus, on the one hand, in cases of traffic jams, airplanes stack that cannot land on schedule, fires, earthquakes etc., the GDP goes up because more gasoline is used, because the fares goes up and overtime must be paid, while the reconstruction after fires and earthquakes increases expenses etc. But on the other hand, the improvement of automobile traffic and of airplane schedule leads to a lower GDP.
Morgenstern (1975) more fundamental criticism is that the functioning of a complex economy cannot be measured by one single scalar number. According to Morgenstern, in order to measure economic growth and welfare it would be necessary to have a method whereby changes to be recorded at least by a vector (and not by a scalar) and also a theory that establishes some criteria of selection of the relevant transactions. But, knowing that the same bundle of goods and services and the same actions could be evaluated differently by different persons, even the possibility of such a theory that ensure the selection of relevant transactions it is questionable in measuring welfare. In fact, if utility is strictly a personal matter (Morgenstern 1975), then measurement, comparison and the aggregation of individuals’ utilities are meaningless. This difficulty, also known as the impossibility of interpersonal utility comparisons, cannot be overcome by broad classification of people by the law of large number and things like that because what matters for welfare in the last analysis is what value or utility every individual attach to their possessions and income. The same bundle of goods will have different value for different persons (or even for the same person in different circumstances).

Therefore, an aggregate expression of total welfare in a society is difficult or even impossible to conciliate with a subjective theory of value. In economics, a subjective theory of value signify that the value of a goods and services does not depend on their inherent properties or on the amount of labour necessary to produce them, but instead it is strictly dependent on individuals’ evaluations (acting in different circumstances and following different ends). Further, as long as it is not assumed that individuals are like programmable automatons, there is no known method to determine with absolute certitude what value each person attach to different goods and services and to make utilities of different persons comparable. Also, when some goods and services are transferred (for instance by taxation) from a person to another it is no way to find out objectively whether the same utility was transferred from one person to the other person.

6. GDP: Some Related Theoretical and Practical Difficulties

Another well-known difficulty related to GDP is that many services and products that never enter the market are not taken in the account in determining the size of the GDP (Morgenstern 1975) (Coyle 2014). The underlying objection is that there is an arbitrariness in selecting goods and services that actually enters GDP and those that does not enter. For instance, if services like cooking, washing and other services related to household administration are realized by contracted entrepreneurs or companies they enters GDP and it is considered that they add something to growth and welfare but if these kind of services are simply realized by homeowners, wives etc., they are ignored simply because it is difficult to assess their size and monetary value. This means that in more traditional types of communities or societies, where many services and goods are produced or realized at home, economic growth and welfare cannot be appropriately measured by GDP. Furthermore, the fact that the measurement of economy by GDP does not take into account the profitability of economic activities is considered another important shortcoming (Casey 2015). For instance,
a block of flats is assumed as increasing GDP no matter whether it is a profitable investment or not, being inhabited by someone or empty and abandoned.

Other three important criticisms of GDP are formulated by M. Rothbard, M. Skousen, F. Shostak, C. Casey and R. Murphy. First criticism is related to the fact that large production of GDP is actually not marketed, as, for instance, everything that is done by government. M.N. Rothbard challenged the orthodox postulate that government spending represents a net addition to the national product. Although it is assumed that government activities are benefiting the economy and society in general, this aspect cannot be proved simply because there is no way to assess and economically calculate if the governments activities of producing goods and services is really profitable in comparison to other (counterfactual) investments that private producers would have realized if they have had those funds available. Rothbard explains that “spending only measures value of output in the private economy because that spending is voluntary for services rendered.” Instead, “government spending has no necessary relation to the services that it might be providing to the private sector. There is no way, in fact, to gauge these services.” (Rothbard, 2008, 339)

Another problem is related to the exclusion of intermediate goods from GDP measurement. Intermediate goods are eliminated allegedly in order to avoid double counting. The problem is nevertheless that the line between intermediate and final transactions is arbitrary traced. For example, a car is considered a final good and it is counted in the inventory, but all the intermediate goods used for its fabrication (metal, rubber, plastic etc.) are not counted. Thus, the exclusion of certain intermediate transactions leads to the omission of massive volumes of economic activity from national account.

C. Casey (2015) questions that there is really double counting or triple counting of some products if we take into account that transactions considered “final” this month or this quarter are added to intermediate goods that will likely be used for “final” products that will be sold sometimes in the future. Instead, Skousen (2013) admits that if intermediate products are taken into account double counting does occur but he adds that double counting is actually a necessary feature to understanding the overall economy. M. Skousen (2013) stresses that if economists really want to make predictions and policy recommendation regarding business cycles they should not ignore gross output (GO) because this indicator is more accurate and indicative regarding the depth of depressions. For example, in the context of financial and economic crisis of 2008-09, nominal GDP declined only 2% while nominal gross output fell sharply by 8%. Further, M. Skousen (1991, 2013, 2014), F. Shostak (2001) and C. Casey (2015) emphasis that limiting GDP to the final output unjustified overstated the role of consumption in national account. This fact was easily perceived when U.S. Commerce Department changed in 2014 the method for gross output estimates, including intermediate transactions in the model. With the new method it was estimated that consumption accounts for 40% of all economic activity in U.S. instead of 70%.

R. Murphy’s (2011) criticism is targeted to the practice of netting imports against exports in determining GDP, the objection being that the overall role of trade in economic activity is unjustifiably understated. For instance, if the consume in an economy is 1 trillion dollars while imports and exports are the same (1 trillion each) this may give the false
impression that the respective economy is 100% driven by consumption even if this is not at all true.

Besides all these criticism targeted on how growth and welfare is measured using GDP, the practical difficulties in assessing the state of an economy by GDP are glaring in many cases. For instance, the changes of the weights used in calculating the price index (and consequently real GDP) lead to a very different classification of countries as low-income countries or middle income countries. Until November 2010 Ghana was classified as “low-income” country, but starting with November 2010, Ghana’s GDP increased by 60 percent overnight, turning it officially into a “low-middle-income” country. “The reality had not changed, but the GDP statistics had” remarked Diane Coyle (2014) in this case. The 1970s crisis (or maybe non-crisis) of Great Britain is another illustration of the fact that GDP statistics can be very misleading and that its importance is overstated. Assessing economic situation of Great Britain on the basis of GDP statistics, British government asked for an IMF loan and enforced public policies in order to reduce fiscal deficit. After GDP figures were revised, the conclusion was that crisis was not so bad. But in the meantime the IMF loan was contracted and the Conservative Party that was in opposition at that time won the next elections.

7. Conclusions

The national account history reveals the fact that national income definitions depends to a great extent on the political imperatives of the time. Both early and modern approaches to national accounting were conceived mainly with the aim of estimating available resources to fight wars in a more efficient manner. The important difference between early and modern approaches of national account is that while in the early approaches the underlying idea was that government interventions reduce rather than increase economic growth, in the modern approaches it is already supposed that government interventions and fine tuning of the economy through fiscal and monetary policies are necessary for economic growth. In estimating national account it is unconceivable to have no underlying criteria or scheme of values and to make no choices at least regarding price index. Therefore, hardly someone could maintain that there is an unchallenged value-free scientific basis in assessing the state of an economy. Econometric and statistical instruments used to assess the state of an economy cannot demonstrate by themselves that a certain economic policy contributed to economic growth and welfare or not. They only illustrate with data the underlying theory and scheme of value already implicit in the tools of measuring and assessing the state of an economy. The usefulness of GDP in assessing the state of an economy may not be rightly claimed beyond its own presuppositions and its original intent.

Although the shortcomings and limitations of assessing the state of an economy by GDP were repeatedly emphasized by eminent economists and statisticians, GDP is still very popular and cannot be ignored because it is a very important indicator for policy makers and economic analysts from media. But the dangers of relying on it in assessing the state of an economy didn’t fade away. The most recent historical episode that revealed this aspect was the financial and economic crisis of 2008. Shortcomings of GDP as a tool of assessing the
state of an economy are revealed in practice but they are still constantly ignored by the majority of policy makers and political and economic analysts.

Bibliography


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