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**CENTER FOR ADVANCED ECONOMIC STUDIES**

**The Quality of Serbia's Economic Statistics: A User's Perspective**  
**Report**



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**Contents**

- 1. Overview and Background ..... 4
  - 1.1. Demand for Macroeconomic and Sector Analysis ..... 7
  - 1.2. The 2006 Study ..... 8
- 2. Key Indicators of Current SNA Accounts Shortcomings ..... 10
  - 2.1. Data revisions ..... 10
  - 2.2. Expenditure side: Investment ..... 12
  - 2.3. The Production Side: GDP and its Valuation ..... 17
    - 2.3.1. Production of the IT Services Sector ..... 18
    - 2.3.2. The Invisibly Small ..... 20
    - 2.3.3. The Other Extreme: Basic and Fabricated Metal Products ..... 22
- 3. Ten Years of Improving Statistical Compilation Methods ..... 24
  - 3.1. Analysis ..... 26
- 4. Conclusion ..... 28
- 5. Recommendation ..... 29

## 1. Overview and Background<sup>1</sup>

Statistics are the basis for decision-making, public and private. Investment decisions, pricing decisions, interest rate decisions, infrastructure decisions and sector policy decisions – all require public statistics. Private companies integrate public statistics into their own management information systems. Governments and central banks have the responsibility to manage macroeconomic policy: whether interest rates go up or down can depend on inflation, the prices producers pay, the exchange rate, wages, unemployment and international trade and payments. Without reliable data, how are decisions to be taken? By throwing a dice? If the data are not reliable, how can the decisions be correct? And what are the consequences of uninformed decisions for the economy and society?

A Serbian corporate finance and investment advisory company tells of their quest for reliable information, as they needed to analyze the size of the market for a producer of sand and gravel they were restructuring. They started by collecting official statistics. Numbers were available, but once they started analyzing them, it became clear they do not make sense. To obtain its assessment the advisory switched to scouting the country and counting the backhoes digging gravel and sand.

This example is not isolated, nor is the frustration with the quality of economic data limited to potential private sector users and analysts of industrial activity and market information. Frustration has also been repeatedly voiced by the select community of the country's macroeconomic data users. Such a frustration with economic data is not surprising in a developing, post-conflict, country.

The puzzling issue in Serbia's case is that observed shortcomings in the quality of the data, happen even though Serbia's statistical methodologies essentially meet international standards according to assessments of the relevant external observers. As described later in the text, Eurostat and the IMF, two key institutions for standards for economic statistics, and for their improvement for Europe, attest to the fact that Serbia's methods in the production of national accounts are broadly adequate. How is this possible?

Far from being a criticism of the relevant institutions, this paper documents the problems with the data, seeks to understand the situation and to propose ways to improve the results of the considerable data compilation efforts. Indeed, the Statistical Office of the Republic of Serbia (SORS) has done an impressive amount of work in the ten years since improvements to the ravaged Serbian statistics started in earnest. External observers have rightly praised SORS for that. The problem, as we see it, lies principally in their efforts being spread too thin, and in the priors and administrative culture inherited from the past that may preclude the application of detailed but more robust estimation methods. Also, some of the circumstances underlying the

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<sup>1</sup> This study uses thorough and rigorous of economic analytical knowledge and substantial knowledge of statistics, to draw robust policy relevant conclusions that we wish above all to make accessible to the decision-maker community. One way to increase the accessibility of the analysis was to not insist on precise statistical terminology, or exhaustive definitions, unless they were critical to the particular argument being made. Hence, for example, we refer to "investment", which is understood by any educated interlocutor, rather than to "gross fixed capital formation (GFCF)" which really is the statistical concept most often dealt with in the text. When relevant, we refer to the precise term in footnotes. Similarly for aggregate gross value added, versus GDP.

observed problems are a reflection of broader weaknesses in institutional coordination outside the control of statistics, and in the implementation of the legal framework for the new market environment in Serbia.

It is of critical importance that these problems be addressed soon, however. The shortcomings in the data do not only preclude the development of a more sophisticated private sector, capable of strategic thinking, based on well-informed analysis of the opportunities and constraints it faces. As we argue, they preclude also adjustments macroeconomic policy development, as they bias the picture of the country's macroeconomic structure, and send unreliable signals. The country cannot afford this at a time when the carefully steering of the country's macroeconomic policy is of utmost importance to its sustainability.

To illustrate how important are more accurate estimates, consider the consequences if our hypothesis that GDP is underestimated by 10-15% were confirmed. Taking the mid-point adjustment, the share of general government spending in GDP would decline from 43.8% to 39.1%, and the public debt at end-December would decline from 60.4% to 54% --a considerable change in perspective! The urgently needed reduction in the fiscal deficit would suddenly become a slightly less structural and slightly more short-term policy issue.

Most of this paper deals with the evidence of weaknesses in the data and methodological issues, answering how is it possible to have adequate methods and produce weak data. However, there is another angle to this paradox: how is it possible that greater effort has not been directed towards improving the quality of the data, instead of towards program expansion and methodological revision adopted by SORS. What has been driving the evolution of Serbian statistics, if not users demand? In the next section of this introductory chapter we but set the scene for answering this second question. We limit overview to briefly assessing the limitations of demand for economic statistic data, principally for policy purposes. Limited demand is the key factor of limitations in data quality, but there is also a feedback effect. In an environment of perennially weak data, whose use in analyses of interest (if at all possible) requires considerable previous adjustment effort, the analyst community is less likely to develop quantitative, evidence-based research and analysis skills and practices.

The present report is critically informed by a Study of the macroeconomic structure and economic statistics in Serbia conducted by CEVES in 2006. This was an ambitious, in-depth piece of research that established that the GDP and investments levels at the time were seriously underestimated (by respectively, at least 8%, and as much as 60%). National accounts revisions since that time have validated those conclusions, but not fully. This issue is picked up in the last section of this chapter.

Data shortcomings today are not as extreme, and as the present analysis is much more limited in scope, it cannot provide unshakeable evidence. Still, we believe the evidence we produce, especially taken together, paints a compelling picture of the scope of improvement for Serbia's data. In the next chapter, we first discuss the fact that Serbia's national accounts data

present suffers from more revisions than any other in the region<sup>2</sup>, and with a greater variance. While some of these revisions are due to continuous methodology improvements occasional, radical changes in indicator estimates signal that decision-makers often make decisions based on wrong information.

We further proceed to probe national accounts from the expenditure and production side. On the expenditure side we analyze the composition and dynamics of investment contrasting two investment components – foreign equipment and construction work with different sources of information on similar aggregates. We conclude that total investment and investment components real growth rates have limited credibility and the level of investment continuous likely to be underestimated. We open the discussion of the GDP measured from the production side, presenting a very compelling analysis of Serbia's VAT collection, performed USAID. The analysis strongly suggests that Serbia's GDP is underestimated by 10-15%. We proceed to probe SORS's assessment of the production of IT services. While their true value, including the grey economy, is easily underestimated, we refer to information gathered by a private company, which in comparison suggests that SORS is missing to account for a part of the official market. We also find the estimated value added of IT service providers inside the sole-proprietor population to be incredibly low. Further, we compare the business structure of value added published by SORS, with that of CEVES's proxy for value added derived from the same original data. The comparison suggests that the value added of microenterprises, and especially of sole-proprietors is underestimated.

We conclude the analysis in the second chapter with an investigation of the estimates of real and nominal value added for the basic and fabricated metal products. This probe serves to illustrate a “best case scenario” of a sector with relatively few products, and few large producers as well as measurable coefficients. The evidence suggests that one of the problems for SORS is presented by insufficient information at the most basic, product level.

In the third chapter we present methodological issues in a summary manner, and analyze the most likely causes of problems observed. In essence, the answer to the puzzle above, is that indeed the methods nominally followed by SORS although imperfect make sense, and keep improving in the sense that more and more data presentations and angles are produced. However, there are some fundamental problems at the very basic level of data collection and processing, which produce shortcomings that can only be really seen by analytical users. Primarily, these are in the coverage that is accomplished in information collection, and in estimation methods followed when data are absent, either because of non-response to reports required, or because insufficiently comprehensive surveys. A very fundamental problem appears to be an incomplete or out of date statistical business registry.

It is of critical importance for SORS to prioritize the use of its resources, as it is presently pursuing at least three large and one smaller program in the statistics of national accounts: revising national accounts figures to reflect SNA2008/ESA 2010 methodological standards by the Fall of this year; switching from product based to deflator-based volume measures;

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<sup>2</sup> Danko Brčerević, Milojsko Arsic, Quaterly Monitor No. 35 ‘Review no. 3: Does Statistical Office of the Republic of Serbia (SORS) provides good and relevant data?’

compiling for the first time Supply and Use tables; and assessing the non-observable components of GDP. The first among these programs takes a considerable effort and renders improvements on the margins for sophisticated data producers. While the Supply and Use tables and deflator-based volume measures could contribute to an improvement of the data, their compilation could still leave a considerable portion of official GDP unobserved. This because we believe a good part of the GDP omitted in the current statistics is in the service sector—as services can easily remain unobserved both from the supply and use side, reconciling these two sides alone will not ensure they are adequately covered. The high value added portion of the service sector, however, may well be extremely important for Serbia because of anecdotal evidence that it exports them, at least in the region to a substantial extent.

Hence, none of the above methodological improvements is as important as the improvement of the business registry, improvement in estimation of the value added of the small establishments, and in particular providers of high value services. Only with careful accounting for the registry entities and better use of survey information to account for non-response and underreporting can their value added be understood and better estimated.

### **1.1. Demand for Macroeconomic and Sector Analysis**

The private sector and policy-makers both need national accounts and industrial activity data. There are two official, government, institutions publishing macroeconomic analysis (as opposed to retelling published statistical data) -- the National Bank of Serbia (principally, in its *Inflation Report*) and the Fiscal Council in its regular analysis of fiscal trends. Also, the most comprehensive macroeconomic quarterly analysis is published by an independent think tank associated with the Belgrade Economics Faculty – Foundation for the Advancement of Economics’ (FREN), in its Quarterly Monitor of Economic Trends and Policies (QM). The most in-depth real sector short-term activity analysis is published by the Economic Institute in its Macroeconomic Analyses and Trends (MAT). As, to our knowledge, these are the only institutions doing more than simple replication of statistical data series, and given the personnel connections among some of the staff involved, we can say that there are approximately 6-8 individuals in Serbia comfortable with complex manipulation of national account data, and as many more, comfortable with their use and analysis. Of course, the contribution of international institutions in this area is also a key.

There is little other than MATs monthly industrial growth projections based on simple extrapolation of the industrial index growth. We are not aware of any kind of regular sector analysis (short-term, long-term, Serbia specific or international) being published by any institutions. Large foreign investors rely on commercial market research companies for basic market information. The studies focusing on specific industries, supported by international donors that have come to the attention of this author have for the most part shunned official data, relying cautiously on the annual financial data held by the Business Registry Agency (BRA). Opposite examples exist as well. The Chamber of Commerce staff often (not always)

uses official data, but in informal communication experts convey concerns. A rule of thumb would be that the more sophisticated the analysis a user needs to perform, the more the user will have to invest in understanding the problems, and adjusting the data.

In addition, while we believe that most government departments must use some economic statistics in one way or another, we know of only the Ministry of Finance and Social Inclusion and Poverty Reduction Unit (SIPRU), that do, respectively, basic fiscal and related economic activity data monitoring, and poverty and labor analysis. As far as we know, the Ministry of Economy sub-contracts any necessary analysis to external consultants. There is also one government institution dedicated to development indicator monitoring, inherited from the past: the Office for Planning and Development (“Zavod za plan i razvoj”). We have a difficulty in establishing with clarity how much analysis they do today – there is little on their website. We are aware of their participation on developing sector strategies, but data do not seem to be subject to complex analysis.

Clearly, this overall lack of public sector analysis and capacity translates into weak public demand for the use of statistical data. Hence, the statistical data itself are also extremely weak, and this, in turn results in weak demand for statistical data and analysis from the private sector.

Academic economists in Serbia are also traditionally not oriented towards quantitative analysis. In fact, strikingly few academic economists use more than isolated indicators to illustrate points. Now that submission to EU scientific standards is putting pressure for the conduct of rigorous economic research, this is incentivizing academic, not policy oriented research.

As can be imagined, given this small community of users, the discourse about macroeconomic or industrial sector processes and phenomena is limited both in scope and in publicity. This weak foundation is a factor in a vicious cycle, or negative feedback loop. On the one hand, weak data dampens demand for better information. On the other, within a context where it is laborious to obtain data and this may end up misleading, demand is all together discouraged.

## **1.2. The 2006 Study**

We start from existing discussions of the quality of Serbian statistics, discussing the validity of the arguments and consider the implications. Further, we focus on the national account figures and probe them analytically from several angles to identify the likely causes of the difficulties. In this, our understanding of the SNA figures is importantly informed by a 2006 CEVES study, the result of nearly a year of detailed study of Serbia’s macroeconomic data, assessing Serbia’s macroeconomic structure for independent monitoring and policy advocacy purposes. At the time, the study showed serious shortcomings in Serbia’s macroeconomic, particularly SNA, data seriously skewing the picture of Serbia’s economic structure. The quality of the data has undoubtedly much improved since, and our conclusions at present are not as extreme. Nor can they be as definitive as the current investigation is much more limited



in scope than the 2006 Study. Nevertheless, the evidence strongly suggests that the fundamental problems affecting the data at the time have not been removed.

The figures analyzed by CEVES have since been revised by SORS. While the IMF at the time made large corrections to this figures in its analyses, today it uses the official figures. At the time, the 2006 Study found that official statistics underestimated GDP, as would normally be estimated by official statistics (i.e. without accounting for the grey economy) by at least 8% (a conservative estimate), while investment was underestimated by as much as 60% in the published 2003 figures, and 30% in the unpublished, preliminary, 2004 figures. The resulting investment-saving balance simply lacked credibility showing negative domestic saving (GDP minus total consumption), and would have been deeply unsustainable.

The macroeconomic structure painted by today's figures is less extreme, and the improvements are reflected in the revisions to past years data. Today's GDP figure for 2003 is only 5% lower than CEVES estimated in the Study, and the one for 2004 only 1,4%. Today's figure for investment in 2003 has been revised upwards by 20% (remaining 33% lower than CEVES's estimate at the time), while the one for 2004 remains 22% lower. However, the overall macroeconomic picture remains suspiciously skewed, with gross domestic saving in most years amounting to 3% GDP, or less.<sup>3</sup> Serbia's propensity to consume is certainly unsustainable, but this could be exaggerating it. The World Bank estimates the same figure to range between 9-11% in 2009-2011. The IMF in its recent documents has not shown investment-saving levels.

The 2006 Study identified two kinds of problems, the first accounting for underestimations of key magnitudes, and the other accounting for unreliable assessments of trends and processes in general. One problem lay in the difficulties SORS had in adjusting its procedures inherited from the former Yugoslav system to the new reality of a private market economy. Access that CEVES had at the time to SORS's raw data (especially regarding investment figures), as well as to the financial reports submitted annually by all incorporated entities, unambiguously confirm that the data suffered from very high levels of non-response that was all too easily treated as absence of activity. Also, as far as we could tell adjustments for underreporting were virtually absent.

The second kind of problem relates to the heterogeneity of economic processes characterizing transitioning economy. While some sectors, kinds of agents, and kinds of business relations might be speedily gaining in strength, others might be imploding. It does not help in those circumstances that these different agents are likely to have different compliance habits when it comes to reporting requirements. If, say, the agents imploding in the early years of transition tend to report more, their contribution to overall processes will be exaggerated. Then declines will be exaggerated in early periods of transition and recoveries in later ones. Finally, the study also argues that economic statistics have been affected by priors according to which the contribution to the economy of small economic agents is of secondary importance. In this

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<sup>3</sup> The calculation of gross national saving is a little more complex. Derived from published national accounts and balance of payments data amounts to around 10,5%, despite including very high transfers.

worldview, they are unlikely to reach a scale that would merit investing the resources that it would take to reliably assess their contribution.

## **2. Key Indicators of Current SNA Accounts Shortcomings**

### **2.1. Data revisions**

Revisions to initial national accounts estimates are perfectly normal, due to more information become available after the deadline for compiling the first release. However, these revisions in Serbia can be of unexpected magnitudes. Moreover, Serbia's national accounts - both GDP and its components – have been revised with more frequently over the past ten years. In some cases, the data changes were made following methodological changes, which were undertaken in order to improve compliance with European and global standards and hence international comparability. In the case of the national accounts, past data were also revised to maintain comparability with current data. The unintended consequence of these frequent revisions is that the data have lost credibility as a firm basis for policy or investment decisions.

Mr. Danko Brčerević in “The Reliability of Official Gross Domestic Product Data in Serbia”, published in Quarterly Monitor 24, examined the causes and consequences of the changes to the national accounts that were made in 2011. The basic facts were stated as follows:

“In March 2011, the Statistical Office of the Republic of Serbia (SORS) published its revised real growth rates of the gross domestic product (GDP) for the 2001-2009 period, the nominal GDP for 2009 (which was done according to the regular official data publication calendar) and its corrected data for the nominal GDP in 2007 and 2008. The revision of the real growth rates was done because of improvements in methodology: (1) switching over from calculations based on fixed prices (2002) to calculations based on previous year's prices, (2) changes to activity classifications and (3) a revision of indicators used for estimates of value added in individual sectors. The corrections of the nominal GDP for 2007 and 2008 were done because of the application of a new calculation methodology in the statistics of foreign trade, which has led to an increase in the value of imports”<sup>4</sup>

The consequences were corrections to GDP that ranged from a 1 percentage point increase in 2004 to a 1.7 percentage point decrease in 2008. The measure of total real GDP growth from 2001 to 2009 was reduced from 47.7% to 41.8%.

Mr. Brčerević makes a systematic comparison of the revisions made to 2004 GDP figures in Serbia and in a number of countries in the region, in the period from 2006 (when the figure became official in Serbia) to 2011. He notes that the revisions in the case of Serbia are more frequent, and the figures show a larger variance than in any of the comparator countries. 2004 data was in fact revised in every year of the period, a total of five times, returning, in the end, to the same number as originally measured.

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<sup>4</sup> Danko Brčerević, Quarterly Monitor No. 24, Review No 2, “The Reliability of Official Gross Domestic Product Data in Serbia”.

Mr. Brčerević also refers to the 2009 real GDP decline which the official statistics still shows as amounting to -3,5% --one of the shallowest declines among the countries in the region in that year. Since the first estimates were issued in mid-2009, their credibility has been questioned by FREN and by Mr. Brčerević in particular. As the official 2009 figures were published early in 2011, the concern that the decline had to have been sharper (based on an inconsistency in implicit deflators) was voiced by authors in MAT.<sup>5</sup> In the event, as conveyed to CEVES in a number of interviews, their suspicions received further confirmation soon thereafter, when an IMF statistics mission assisted SORS in completing, for the first time, GDP by expenditure tables at constant prices. It is today accepted in SORS and known in the circle of those well-informed, that the actual real GDP decline in 2009 was above -5%, and it is expected that this revision will appear with the next large revision of the NA data, in the fall of 2014.

Deep and surprising revisions to GDP do not end in 2011, nor do they refer only to the early years, before important innovations in SORS's assessment methodologies were introduced. Mr. Brčerević returns to the subject of GDP statistics in the March 2014 issue of the Quarterly Monitor<sup>6</sup>, concerned with recent revisions to investment and the relationship between real and nominal GDP. While in his earlier article he concluded that there was no systematic bias in reporting/revising real national accounts data, in this article he notes that the errors in projected current year nominal GDP figures, issued in the last months of the year, do systematically overshoot the value of later estimates. This, in fact, happened in every year since 2009, and most of the time real growth rates remained little changed, while corresponding revisions were made to the implicit deflators. In particular, a new official figure was issued for nominal GDP in 2012 that was 1.1% lower than the earlier official figure while real growth was revised upwards by 0.2 B. P. The implicit change in the deflator--of 1.3 is substantial considering the inflation and the dinar depreciation figures.

The first estimate of 2013 GDP figures issued by SORS, according to the regular calendar, at end March confirms this pattern: the headline GDP figure has been reduced by nearly 4% relative to the November projections used in the development of the country's Fiscal Strategy. Other revisions do not seem to explain this change, as inflation was revised downwards by about 0.5%, but the real growth was revised upwards by approximately as much. The exchange rate did not hear much from expectations either. Some justification can only be found in the fact that nominal GDP in 2012 had previously just been revised down by 1.2%, as described above.

We focus here on investment, picking up the relationship between real and nominal figures later on.

Mr. Brčerević examines the 2012 national accounts in his report, 'Review no. 3: Does Statistical Office of the Republic of Serbia (SORS) provides good and relevant data? The article focuses on the revisions concerning the investment data in the national accounts,

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<sup>5</sup> Macroeconomic Analyses and Trends No. 198, "Actualities in economic policy".

<sup>6</sup> Danko Brčerević, Milojsko Arsic, Quaterly Monitor No. 35 'Review no. 3: Does Statistical Office of the Republic of Serbia (SORS) provides good and relevant data?'

together with the GDP deflator (the measure of inflation over the whole economy), as well as the labor force survey. We consider the investment issue here.

The article questions whether the revisions to the 2012 GDP components can be justified or whether difficulties exist in allocating economic flows to the right classification. Mr. Brčerević report first looks at the investment figure, noting that investment flows in national accounts can vary widely from one year to another; and that revisions to this data can be fairly large in magnitude, due to the difficulty of collecting sufficient first estimations. The initial estimate for investment was a real decline of 3.4%, which was revised to a real growth of 14.4%, a difference of around 18%.

As noted by Mr. Brčerević, GFCF is shown by SORS as growing by 20.9% in nominal terms and 14.4% in real terms, implying an investment price deflator of 6.6%. This is noticeably close to the implicit GDP price deflator of 6.0%.

## **2.2 Expenditure side: Investment**

The 2006 study made the case that investment was structurally substantially underestimated. Our concern here is to examine whether the national accounts investment data has become more reliable since then. We examine the 2012 national accounts investment data for consistency with other published statistics from SORS and international data sources. The summary national accounts provided by SORS show ‘gross fixed capital formation’ (GFCF)<sup>7</sup>, which is often described as ‘investment’ broken down into: construction, domestic equipment, foreign equipment, and other fixed assets. The nominal (current price) investment figures broken down by these components for the period 2008-2012 are shown in the upper half of Table 1, with the real growth rates shown in the bottom half. As can be seen from the growth rates (14,4 % for total investment in 2012), these are the revised figures for 2012, discussed by Mr. Brčerević.

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<sup>7</sup> European System of Accounts 2010, pp73-74: gross fixed capital formation (P.51) consists of resident producers’ acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units. Fixed assets are produced assets used in production for more than one year.

The following types of gross fixed capital formation are distinguished: (1) dwellings; (2) other buildings and structures; this includes major improvements to land; (3) machinery and equipment, such as ships, cars and computers; (4) weapons systems; (5) cultivated biological resources, e.g. trees and livestock; (6) costs of ownership transfer on non-produced assets, like land, contracts, leases and licences; (7) R&D, including the production of freely available R&D. Expenditure on R&D will only be treated as fixed capital formation when a high level of reliability and comparability of the estimates by the Member States has been achieved; (8) mineral exploration and evaluation; (9) computer software and databases; (10) entertainment, literary or artistic originals; (11) other intellectual property rights.

[http://epp.eurostat.ec.europa.eu/portal/page/portal/esa\\_2010/introduction](http://epp.eurostat.ec.europa.eu/portal/page/portal/esa_2010/introduction)

**Table 1: Technical structure of investment<sup>1/</sup>**

	2008	2009	2010	2011	2012
	mill.RSD, current prices				
<b>Total</b>	<b>632.411</b>	<b>510.227</b>	<b>512.287</b>	<b>592.844</b>	<b>717.245</b>
Construction	272.369	253.086	242.446	304.173	305.813
Domestic equipment	180.851	136.597	144.187	145.044	160.581
Foreign equipment	138.796	96.611	100.065	106.982	207.637
Other fixed assets	40.394	23.933	25.590	36.645	43.213
	Real growth rates (%)				
<b>Total</b>	<b>8,5</b>	<b>-22,1</b>	<b>-5,5</b>	<b>8,4</b>	<b>14,4</b>
Construction	1,2	-6,7	-9,9	17,0	-3,4
Domestic equipment	10,9	-28,5	-0,4	-11,1	6,9
Foreign equipment	15,1	-36,9	-2,3	9,3	78,8
Other fixed assets	28,6	-46,6	-1,0	34,4	4,1

Source: SORS

1/ SORS - Data base - National Accounts - Gross fixed capital formation

We next compare foreign equipment accounted for an investment, to imports of capital goods as shown in the foreign trade data -- and we conclude they are, indeed, quite substantially smaller although the difference appears to be declining over the years. The comparison is shown in Table 2 below. We show capital goods imports according to two classifications--the EU classification and the BEC classification. They differ quite substantially in level, as goods crossing the border are notoriously difficult to classify by use--similar commodities can serve different purposes (for example, a car could be seen as a durable consumer good, or as the capital equipment of a taxi driver). However, import of capital goods according to either is consistently substantially larger than the amounts that statistics captures in investment (by over 20% and 9%) throughout the years of observation. Imports of capital goods might be hard to classify, but they are generally more easily, reliably observed than all the components of investment spread throughout the economy. We cannot rule out, that capital goods imports may be over invoiced as a method of evasion of capital control.

**Table 2: Imported Capital Equipment: Investment versus Foreign Trade Statistics, 2008-2012 (mill RSD)**

	2008	2009	2010	2011	2012	2013
1. Foreign Equipment <sup>1/</sup>	138.796	96.611	100.065	106.982	207.637	...
2. Capital Equipment imports, BEC classification <sup>2/</sup>	171.163	129.798	147.084	193.344	210.657	...
3. Capital Equipment imports, EU classification <sup>3/</sup>	311.101	245.773	203.607	237.951	338.711	409.352
Discrepancy, in percent of Total Investment <sup>4/</sup>						
Relative to BEC classification	5,1	6,5	9,2	14,6	0,4	...
Relative to EU classification	27,2	29,2	20,2	22,1	18,3	...

Source: SORS

1/ SORS - Data base - National Accounts - Gross fixed capital formation

2/ SORS - Foreign trade statistics - B.E.C. classification

3/ SORS - Foreign trade statistics - EU classification

4/ Discrepancy represent difference between Capital equipment imports (by each of two classifications) and Foreign equipment relative to Total investment.

We can conclude hence that there is little doubt that investment continued to be underestimated by at least 10% (see memo items in Table 2), until 2012. In 2012 the gap closes, and the question is whether this convergence is the consequence of improved methodology. In 2012 SORS expanded its investment survey to cover sole-proprietorships, so it could be that the upward revisions to the 2012 figures reflect the incorporation of more investment made by sole proprietorships. In that case, of course, this should have been considered a methodological break and not have affected the real growth rate.

However, if the increase in the investment figure was in fact a reflection of improved coverage, then it would have affected all components of investment similarly. Hence the higher apparent growth rates driven by this methodological change should have been diffused across all components of investment. Obviously the growth in the 2012 investment figure is driven by the growth in only the foreign equipment component (78,8%), which is clearly out of line with the much smaller growth rates of domestic equipment (6,9%) other fixed assets (4,1%), and in particular with construction (-3,4%). In a relatively small transitioning economy like Serbia's, this could, conceivably, be the consequence of a very lumpy investment (such as Fiat) happening in an otherwise lukewarm investment environment, but it is hard to imagine that it would not be accompanied by at least a partial acceleration of domestic components of equipment, it is too large for FIAT alone to be the explanation – (about half a billion euros), and one wonders how could statistics have missed it in its earlier estimates.

The sudden increase in foreign equipment investment appears to be mirrored in capital goods imports according to the EU classification. However, this seems to actually be a classification matter: unclassified imports in that year show a large commensurate decline, which reverses

in 2013. It remains to be seen whether the year 2012 is an exception: the difference between imports of capital equipment and investment in foreign equipment declines to 8% according to one classification, and disappears according to the other, while in both classifications unclassified items show bulges (in opposite directions) that reverse in 2013. As a final check, we look at exports from the European Union to Serbia of ‘Machinery and Transport Equipment’ (SITC7 Eurostat’s data for 2011 was EUR 2727 million and for 2012, EUR 2860 million, a nominal growth rate of 4.9%, a normal figure not consistent with a surge in imports related to a capital project, ultimately suggesting that there may be a classification problem.<sup>8</sup>

We also compare the construction component of investment with **construction**<sup>9</sup> statistics from the production side. The production accounts show that the sector of construction is growing by 4.4% in nominal terms and declining by 0.8 % in real terms. (This figure was previously revised at least twice—from 9, 9% down to 1,2%, and then to the current figure). More importantly, there seems to a large inconsistency between construction from the production side and as shown in investment (table 3). These two magnitudes are expected to differ because of some differences in their coverage and timing in which they are recorded. As a component of investment, construction might also include civil engineering works and allied construction activities. However, construction becomes a part of investment essentially when it enters the new owner’s books. In the statistics of the European countries (Table 3 shows the aggregate of the EU 27), the value of construction as a component of investment tends to be somewhat lower than construction works completed. Atypically to other European countries, even to countries in the region, Serbia demonstrates data that are quite opposite, with construction production being greater, which could imply some recording gap or inaccurate source data. The size of the difference in the case of Serbia appears very large and in the opposite direction compared to other EU countries. This suggests that construction from the production side may be severely underestimated.

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<sup>8</sup> [http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)

<sup>9</sup> (1) dwellings; (2) other buildings and structures; this includes major improvements to land;

**Table 3: Construction: Production vs. Investment component**

	2008	2009	2010	2011	2012
<b>Serbia</b>					
1. Construction works completed <sup>1/</sup>	2.675	1.967	1.746	2.167	2.040
2. Construction, component of investment <sup>2/</sup>	3.344	2.694	2.353	2.984	2.703
3. Difference as a % of Construction works completed	-25,0	-37,0	-34,8	-37,7	-32,5
<b>EU 27</b>					
1. Construction works completed	1.935.296	1.592.414	1.566.513	1.543.873	/
2. Construction, component of investment	1.526.147	1.327.393	1.306.114	1.336.884	1.314.695
3. Difference as a % of Construction works completed	21,1	16,6	16,6	13,4	/

Source: Eurostat

1/ EUROSTAT - Data base - Industry, trade and services - Annual detailed enterprise statistics

2/ EUROSTAT - Data base - National accounts (including GDP) - Annual national accounts - Gross fixed capital formation by asset type

Table 4 shows real growth rates of the various components representing trends in construction. It is obvious that the data series do not indicate any meaningful trend and consistency among them, which suggests an inconsistency in the methodology or source data.

**Table 4: Construction - real growth rates, in percent**

	2008	2009	2010	2011	2012	2013
Construction component of investment <sup>1/</sup>	1,2	-6,7	-9,9	17,0	-3,4	...
Construction sector gross value added <sup>2/</sup>	4,7	-19,7	-7,1	10,4	-0,8	...
Use of cement <sup>3/</sup>	7,8	-22,0	-5,2	-3,0	-9,0	-7,3

Source: SORS

1/ SORS - Data base - National Accounts - Gross fixed capital formation

2/ SORS - Data base

3/ SORS - Industrial production by products

Finally, it is instructive to compare the revised national accounts data, received from SORS, with the earlier release, which was obtained from the National Bank of Serbia. The overall GDP changes from 3 386 169 million RSD in the earlier release to 3 348 689 million RSD in the revised data, a decline of 1.1% nominal. The earlier release shows 'investment in fixed assets' (understood to be GFCF) at 604 289 million RSD; the later data is 717 245 million



RSD, a difference of 112 956 million RSD. Even though investment data is subject to large revisions, this remains a considerable change. What is also noticeable is that the change in inventories has been updated from 116 378 to -11 821 million RSD, a difference of 128 199 million RSD. However, the earlier, unrevised figure does look a little high, given that it follows a trend of increases in inventories.

Nevertheless, the rapid increase in investment shown in the revised 2012 national accounts does not appear to be consistent with other data, including other data shown in the same release of the national accounts. One explanation could be that the 2012 data is broadly correct and it is the previous data up to 2011 that show a level of GFCF that is too low and a broadly continuing trend for increased inventories that is incorrect. If this is the case, then ideally earlier data would be revised. The result of such a revision would be a lower level of growth in investment in 2012, which would appear better to reflect the actual situation.

### **2.3. The Production Side: GDP and its Valuation**

The most striking tip that Serbia's GDP in the national accounts is probably still underestimated by 10-15%, comes from Serbia's surprisingly high level of VAT tax collection. The share of VAT in Serbia's GDP is one of the highest in Europe, although its VAT rates are among the lowest. This issue was researched, among others, in the USAID Business Enabling Project Report: 'The Shadow Economy in Serbia: New Findings and Recommendations for Reform' focusing. The study finds that Serbia was able to collect nearly 99% of the VAT tax theoretically owed to it by the various segments of the economy. In other words, the difference between the VAT collected by the country's tax authorities, and the theoretically possible VAT collection-- called the VAT gap-- was only one percent of GDP. Such a high efficiency of VAT tax collection would have been unique, in fact, impossible. The methodology applied in the estimation, in our opinion, is quite robust.

The study used three methods to estimate the size of the informal sector: a cross-country economic modelling approach; a household tax compliance method, using macroeconomic data; and the previous 'Survey on Conditions for Doing Business'. The results showed that the proportion of the economy accounted for by the informal sector declined with economic growth but stabilized during the crisis. The study estimated that the informal economy accounted for 33.2 percent of GDP in 2001 and 30.1 percent in 2010.

The underestimation of GDP detected by the study, however, does not refer to the sizable informal economy it identifies. As the conclusions regarding the VAT gap are derived based on comparisons with official figures in other countries, this observation refers to a portion of GDP that is normally captured in comparable countries' official statistics. In the estimation the authors are careful to distinguish the components of the total expenditure in the country (consumption private and public, investment and other) and the different VAT rates and exemptions that they are subject to. The estimation is not sufficiently detailed, nor is the availability of data sufficient, for the assessment to be foolproof. However, the assumptions

made in overcoming those shortcomings, as well as the biases we expect in the data, are more likely to result in an overstatement than understatement of the VAT gap.

The study finds that Serbia's VAT gap between 2008 and 2011 ranges between 7.3 and 9.7% of hypothetical VAT, or about 1 percentage point of GDP. This is significantly lower than the EU25 VAT gap estimated for 2000 – 2006, which stood at 13.5% of the hypothetical average VAT for these countries. Of course, the gap is even larger in Central and East European member states, 19.3%. The GDP level that would put Serbia's VAT gap in a range comparable to that of the Central and East European member states is 10 to 15% higher than the current figures.

The cornerstone in SORS's production of Serbia's national accounts is the estimation of nominal GDP (GDP at current prices), and this is mainly obtained from the financial reports that the so-called nonfinancial sector (all incorporated legal persons outside of finance) submits to BRA at the end of each year. Total turnover gives a measurement of output at current prices, and from this all intermediate consumption costs are subtracted, giving net output or gross value added. To this, the net outputs of the financial sector, government and that produced by households are added, giving essentially nominal GDP.

### 2.3.1. Production of the IT Services Sector

We turn to an analysis of the internal consistency of data on the production and exports of the IT sector, to show how official production might well be underestimated in some sectors. We emphasize: we are not speaking here of the informal, grey economy, production. (This in the IT sector is notoriously big and hard to capture.) We compare SORS's national accounts and business structure statistics, derive the value added of the IT services provided by the household sector (mainly sole proprietorships), and compared these figures against expert to revenues attributed to IT services and estimates of IT service sales by a private company.

The value added by the two subsectors (62 and 63) that contain IT services for the period 2007- 2012, is shown in Table 5 below from these angles.

One is total sector value added as published in the GDP tables (19.251 million dinars in 2011), and the other is the value added produced by the enterprise sector (17.537 million in 2011). We show separately micro enterprises--those employing up to nine employees, who contributed 3.363 million dinars in 2011. The contribution of the household sector to the total value added of IT services is obtained as the simple difference between the first two concepts. These are, presumably, mainly IT services provided by numerous sole-proprietorships, many of them explicitly registered under these two sectors. We see that SORS estimates their value added amounted to 1,714 billion dinars in 2011.

**Table 5: IT services: Analysis of Sub-sectors' Value Added, 2007-2012 (mill RSD)**

	2007	2008	2009	2010	2011	2012
IT services total GVA <sup>1/</sup>	7.819	10.678	12.160	16.370	19.251	25.215
Enterprise sector <sup>2/</sup>	8.251	9.643	11.387	15.273	17.537	...
o/w micro enterprises	2.366	2.211	2.485	2.941	3.363	...
Household sector (implicit) <sup>3/</sup>	-432	1.035	773	1.097	1.714	...
Memorandum items:						
Exports of IT services <sup>4/</sup>	4.889	7.824	9.461	13.070	16.924	20.929
In percent of total GVA	62,5	73,3	77,8	79,8	87,9	83,0

Source: SORS, NBS

1/ Sum of GVA of sub-sectors 62 and 63 in GDP tables by activity.

2/ SORS - Structural Business Statistics - Value added

3/ Household sector implicitly obtained as the difference between GVA of IT services and IT services VA produced by Enterprise sector.

4/ NBS - Balance of payments

We do not find the figures shown in Table 5 compelling in comparison to the value of registered exports of IT services (lower part of the table) nor when compared to the estimated total turnover of IT services in the enterprise offered by a private company, MINECO, who sells information on the IT sector mainly to IT sector uses. Considering that in 2012 there were almost twice as many registered sole proprietorships (2.849) as there were micro enterprises (1.509) in the two IT service sub-sectors, the implicit value added of IT services provided by the household sector appears small (reaching only one half of the value added of micro enterprises), although not impossible. The figures also suggest some classification inconsistencies, as the enterprise output shown in the business structure tables for 2007 is higher than the total.

The entire sector's value added appears to be small in comparison with revenues attributed to exports of IT services in the balance of payments. IT service exports revenues in the BOP are obtained from inbound payments transactions, which are coded by purpose. In this case the code is „provision of IT services“. <sup>10</sup> The comparison between total produced value added and export revenues needs to be careful, because exports measure production on a gross basis – including intermediate consumption as well as value added. Nevertheless, a 70 to 90% ratio of the value of exports the total sector value added seems to be high, especially as IT services are not characterized by high intermediate consumption.

Our view is lent further support by data assembled by MINECO, a company that collects IT sector information in direct communication with the companies in the BRA registry. Their information is considered reliable and very much used by IT sector companies in their own market analysis. In our discussion with them we reassured ourselves that their approach is careful and systematic. MINECO focuses only on the enterprise sector, but their coverage of

<sup>10</sup> Note that these payments have been made within the official economy and would represent an absolute minimum for official production, if there were absolutely no official production for the domestic market.

enterprises appears to be substantially more comprehensive than that of SORS. Unfortunately, MINECO produces only sales, not value added, figures, but their total sales figure is so large – EUR 595 million in 2011, approximately three times larger than the sector's gross value added in the national accounts-- that it leaves little doubt that the difference cannot be explained by intermediate consumption alone. Moreover, in MINECO's data production by micro enterprises accounts for 2/5 of the total turnover of the IT services enterprise sector. This confirms our view that SORS is missing particularly this segment of the enterprise sector; it also confirms that exports revenues are less than one half of the total market for Serbia's IT companies (also standing in an approximate 2/5 ratio).

Provision of IT services is an activity notoriously hard to observe and pin down. It would normally not be particularly indicative to focus on them as a proof that statistics are missing some part of economic activity. However they are indicative in the case of Serbia, thanks to MINECO's work that proves there are visible, formal, magnitudes not captured by SORS's statistics.

It should be underlined that the difference between MINECO's and SORS's figures may well be at least partly captured in the national accounts as the production of some other sub-sectors. As mentioned, MINECO's work is based on identification of, and communication with, registered companies. This in good measure involves the reclassification of companies registered as providers of other or unspecified services in the correct IT services category. If all other sources of underestimation-- nonresponse, lack of adjustments for underreporting-- were taken care of, the total value added in IT services produced by the nonfinancial sector would still be well accounted in the aggregate of the sector. But this would be a consolation only to the macroeconomist worrying about adequate total GDP figures, not to the many who need to use statistics on the IT sector.

### 2.3.2. The Invisibly Small

CEVES disposes with a historical series of selected indicators from the annual financial reports submitted by all VAT paying enterprises (including large sole proprietors) to the Business Registry Agency. These financial reports are also the fundamental source of information used by SORS in its compilation of nominal GDP figures. The reports are comprised of two parts, the financial balance sheets that are published on the BRA websites, and a statistical annex.

In this section we compare the gross value added assess for enterprises of different sizes (measured by number of employees) in the business structure statistics, with CEVES' proxy variable for value added constructed from data obtained from BRA. This value added proxy for each company consists of the wage bill and the net operating results, if positive. We expect to see a different treatment of larger and smaller companies as small and micro-enterprises are far more numerous, yet likely to have a higher nonresponse rate, while the costs of adjusting their responses to better reflect reality on an individual basis, as we believe is done with at least some of the larger companies, are prohibitive.

For the larger categories of enterprises, we find that the aggregate gross value added as assessed by SORS is substantially larger than that assessed by CEVES' value added proxy— 33.4-43.5 % for large enterprises. This is expected as there are many reasons why CEVES proxy does not come close to the aggregate value added for each group of companies: in the first place, there is no accounting for capital depreciation and amortization; second, a variety of labor contracts and wages may not be registered as employment in the report; third, CEVES has no imputation for nonresponse. There might be signs of a gradual decline in the discrepancy over time, but more clearly, the difference between the two measures declines with the size of the companies: very gently down to small enterprises, and then sharply reversing into an advantage for the value added proxy in the case of micro enterprises.

Table 6 presents the relevant figures for the aggregate of large, medium and small enterprises on the one hand and micro enterprises on the other.

**Table 6: Value added by enterprise size: SORS data vs. CEVES proxy (mill RSD)**

	2007	2008	2009	2010	2011
<b>Large, medium, small enterprises</b>					
SORS <sup>1/</sup>	909.314	999.995	1.051.391	1.109.396	1.197.189
CEVES proxy <sup>2/</sup>	599.697	705.258	723.105	818.907	878.960
Difference in % of SORS	34,0	29,5	31,2	26,2	26,6
<b>Micro enterprises (less than 10 employees)</b>					
SORS	149.177	118.452	109.998	124.717	132.175
CEVES proxy	106.659	127.127	122.839	135.571	141.126
Difference in % of SORS	28,5	-7,3	-11,7	-8,7	-6,8
<b>Micro enterprises - excluding those with large revenues</b>					
SORS	149.177	118.452	109.998	124.717	132.175
CEVES proxy	94.703	111.146	106.984	117.086	122.945
Difference in % of SORS	36,5	6,2	2,7	6,1	7,0

Source: SORS

1/ SORS - Structural Business Statistics - Value added

2/ Value added obtained by BRA financial statements of enterprises

While in the top panel of the table we can see that the gross value added is 26-34 percent larger than CEVES proxy, in the second panel of the table we see that other than in the August 2007 year gross value added is smaller than CEVES proxy for all other years, by about 7-12 percent. This result is puzzling. A possible explanation might be that that SORS is not completely consistent in its classification of enterprises solely by number of employees. It would not be surprising if SORS did not include in the micro enterprise group enterprises employing up to nine employees but whose revenues and assets qualify them for a larger size

category. This would be a logical practice. There are only a few hundred such enterprises and this would allow their specific, individual, treatment where necessary.<sup>11</sup>

We accordingly reclassify (only) the high-turnover micro-companies into corresponding larger categories, and present the comparison of the thus obtained CEVES proxy with the micro enterprise value added as shown in the structural business statistics. The comparison with the SORS value added for micro companies is shown in the bottom panel of the Table. The SORS value added of micro enterprises is larger by approximately 6 to 7% than the aggregate obtained with the value added proxy (excluding the aberrant 2007 figure). However, this is still lower than the difference for the larger enterprises and could be related to the level of non-response. For micro enterprises this averages 18% over the years of observation, compared to around 4-5% for all larger companies. We believe this is strongly suggestive that the value added of smaller enterprises is simply not as well accounted for as that of larger ones.

Finally, we return to the question of the coverage of sole proprietorships. It is indicative of a broader culture, as well as possibly the practical difficulties, that MINECO does not make any effort to include sole proprietorships in its meticulous assessments. Surely they know, better than we do, how important sole proprietorships are as a mode of engagement in IT service production. We know of a company that employs 80 people, but through their individual IT agencies. In essence, the value added of sole proprietorships is assessed from information on the taxes they pay, which are assessed by their local communities based on their presumed income. For some categories of sole proprietors—such as lawyers, medical doctors, and indeed, IT consultants-- these assessed taxes are notoriously low. By reverse logic, their contribution to gross value added is, hence, understated.

### 2.3.3. The Other Extreme: Basic and Fabricated Metal Products

Together with nominal VA derived from financial reports, a cornerstone of Serbia's statistics are real production indices -- measuring indices of physical output produced -- based on information about the units of goods produced and informed by a variety of sources of information, but mainly specific surveys designed for this purpose.

We now looked in detail at production data in the national accounts and from other SORS sources, both to examine the coherence of the data and also to see how the distinction is made between the volume and value of production, hence how production is priced. In order to obtain a fair picture of the approach, we pick a sector with large producers in which statistical assessment should have been reasonably straightforward.

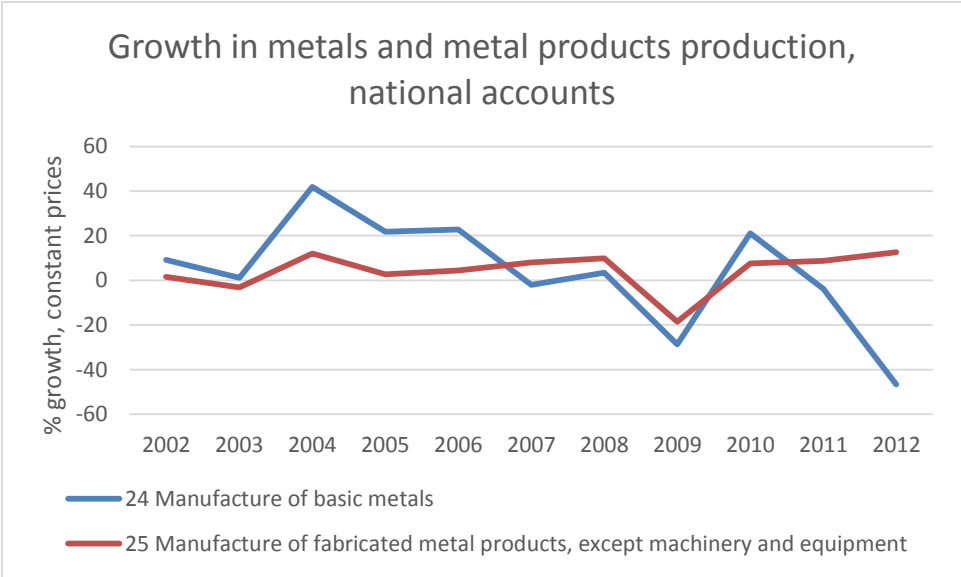
The production side of the national accounts identifies the two sectors we studied: (sector 24) Manufacture of basic metals; and (sector 25) Manufacture of fabricated metal products,

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<sup>11</sup> There are around 390 micro enterprises in terms of employment out of 99.000, with revenues of more than €10 million and assets larger than €50 million which law treats as large. The importance of excluding those from the group of micro enterprises becomes even more obvious, when taking into account that only 0.39% micro enterprises makes such a massive difference in value added.

except machinery and equipment. These sectors are of interest because they are relatively simple to measure statistically: the producing enterprises are relatively easy to identify for survey purposes and the products, especially in sector 24, are fairly homogeneous. The prior expectation in looking at this data was that the national accounts figures would be fully validated. The SORS national accounts data used consist of annual nominal price data and values, constant prices (previous year prices) for 2001-2010. Taking the average real growth rate (the value for year n measured at previous year's prices divided by the value at current prices for year n-1), the basic metals sector has average growth of 3.6% and metal manufactures of 4.1%. These are unexceptional figures.

As the graph below shows, recorded output for both sectors is highly variable, especially for the basic metals. This represents known events in the sectors' history, primarily the closure of a steel mill in 2012. This event is also reflected in the nominal price series. The change can be seen (as depicted in the graph), when the 2012 constant price (2011 prices) data is compared with the 2011 current price data.



Another dataset available to the study was taken from SORS website: ‘Productive economic activity’. This covers gross production in physical quantities – tonnes etc. – of the two sectors in question for the years 2010-2012. The use of this data is not known but it presumably is an early stage input into the national accounts. The data is broken down into sub-sectors – six or seven subsectors (including a small subsector whose allocation is unclear) apparently form part of basic metals; and eight subsectors can be allocated to metal manufactures.

What is remarkable about this data set is that it exists at all. Granted, one tonne of pig iron is much like another (which is why this sector was selected in the first place). But what is the value of a tonne of steel castings? Of other non-ferrous metals? What is the purpose of calculating such statistics? This type of measure appears to be a hold-over from measurements of the previous economic system.

Any comparison of these gross output figures with the net output data from the national accounts needs to be cautious. Sector 24, the manufacture of basic metals is dominated by the

subsector ‘Manufacture of pig iron and steel and manufacture of ferro-alloys with high percentage of carbon’, which provided 95% of physical output in 2010 and 2011 and 86% in 2012. The subsector declined by 75% in 2012; the largest subsector increase in that year was 91% in the tiny (0.1% of output in 2012) subsector named ‘Other primary processing of iron and steel; manufacture of ferro-alloys, except ferro-manganese and ferro-phosphorus with high percentage of carbon’. Even this increase only restored 2010 output. Averaging by physical output (which underweights more valuable products), the decline in the gross output of basic metals sector as a whole in 2012 is 68%, a greater magnitude than shown in the net output national accounts (37%). This reflects the fact that the production of steel and iron castings, more expensive products albeit much smaller in tonnage, has held up throughout the period, but it is unlikely that it has been adequately measured.

The other interesting point from this dataset is that all the other large percentage changes in subsector output between 2010 and 2011 are reversed in 2011-2012. This suggests that there might be a problem with the timing of recorded outputs. Such an issue is more common with frequent data but should not be present with annual data.

The quantities data shown in the series ‘Productive economic activity’ break the statisticians’ golden rule – ‘never mix apples with oranges’. If this data is used as an input to national accounts, it could introduce systematic errors of measurement which are likely to show up in the relationship between output quantities or prices.

If the productive economic activity data shown in aggregate physical measures (tonnes etc.) are actually used in calculations of published economic statistics, they should be replaced by more appropriate measurements. There may also be a problem in the timing of the recording of production.

### **3. Ten Years of Improving Statistical Compilation Methods**

There is little doubt that SORS has been advancing and expanding its SNA program very substantially in the years since CEVES’s 2006 Study. At the time, only annual nominal and volume GDP figures were available and they were compiled only from the production side. Since then, Yugoslavia’s “social accounts” conceptual framework has been replaced with 1993 SNA/ESA 95. Quarterly series were introduced in 2005. A major revision to GDP series, particularly to real growth rates, was published in March 2011 reflecting a rebasing of volume measures from constant 2002 price to chain-linked series based on previous year’s prices. A landmark improvement happened at the beginning of 2013, with the introduction of GDP assessed from the expenditure side, including for quarterly series.

In this period, in addition to basic production and national accounts statistics and numerous reclassifications, SORS has pursued an ambitious program of broadening its economic statistics. For example, it has begun regular compilation of structural business statistics, it conducted a detailed survey of production and intermediate consumption coefficients, a foundation for input-output tables often not compiled by more developed countries, and it is presently conducting research into the non-observed components of GDP (i.e. the informal



economy)<sup>12</sup>. The observer of SORS's program is struck not only by its attention to detail, but also by its breadth. Presently, SORS is investing considerable effort to meet the Fall 2014 deadline for revision of its national accounts series in line with the most updated international recommendations – 2008 SNA/ESA 2010.

The IMF started using the official account figures without adjusting them for analytical purposes when SORS began publishing the expenditure composition of quarterly GDP, early in 2013. In the assessment that accompanies its regular macroeconomic surveillance reports it states that „Although international standards are not yet fully met, official data for all sectors are sufficiently good to support key economic analysis and surveillance. In many areas, including monetary, balance of payments, and real sectors, internationally accepted reporting standards have been introduced.“<sup>13</sup> It further notes “estimates for achieving exhaustiveness in the production account estimates are being produced with an adequate methodology and compiled at very detailed levels.”<sup>14</sup>

The EU's Light Peer Review<sup>15</sup> conducted in the first half of 2011 is appreciative of SORS's progress and efforts, but a few issues do emerge as more problematic, and of interest to us. While it praises the Serbian statistical legal framework, it is clear that there are gaps in implementation. Hence, while “surveys and censuses are in principle compulsory and reporting units can be fined if they fail to provide complete and accurate data, the obligation to respond is not enforced.”<sup>16</sup> Another recurring theme in the Review is SORS's coordination with providers of administrative data and its capacity to influence the content of administrative. One of the Review's recommendations is that SORS needs to investigate how it can strengthen its role in the improvement of administrative sources. Another recommendation is to see how to intensify cooperation with enterprises. While the present staff numbers and qualification levels are judged adequate, there is less clarity on the adequacy of remuneration and levels of staff turnover. In our opinion, the Review overstates the progress accomplished on data quality and institutional coordination, although it delves cautiously into quality issues, given that it was conducted just as a major methodological revisions were being introduced.

While not mentioned in either of the above two reports, an important methodological improvement presently competing for SORS's stretched resources is the compilation of Supply and Use tables. The production of Supply and Use tables would force the product-by-product reconciliation of all the supply (not only production) and all the demand side information sources. Their compilation has been imminently expected for at least two years. A tender for a substantial IPA technical assistance project that lists this as one of its key goals was issued in 2012 and was later canceled and repeated. At present, the project is not under

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<sup>12</sup> This is not an exhaustive description of SORS's economic statistics program.

<sup>13</sup> IMF Country report for the 2013 Article IV consultation Report No. 13/206.

<sup>14</sup> IMF Country report for the 2013 Article IV consultation Report No. 13/206.

<sup>15</sup> EU's Light Peer Review, Internet link:

[http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp\\_ess/partners/candidate\\_countries/sr/tab\\_management#4](http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp_ess/partners/candidate_countries/sr/tab_management#4)

<sup>16</sup> EU's Light Peer Review, page 9

implementation as originally conceived – and there is only one technical assistance advisor helping SORS compile these complex and detailed tables.<sup>17</sup>

Another methodological improvement currently under implementation concerns volume statistics – SORS plans to switch from aggregating quantity indices based on producers' prices, to deflating nominal amounts. This is expected to improve the reliability of volume statistics, since prices tend to move more closely together than quantities.

### **3.1. Analysis**

The methodological advances made by SORS over the past ten years are many and justly recognized by external observers. The magnitude of national account aggregates and their dynamics as reflected in the official data are likely much closer to reality today than they were at the time of the 2006 Study. However, we believe we describe essential problems with the quality of the national account and employment figures that are not duly recognized by key external observers of Serbia's statistics, not fully understood by its local users.<sup>18</sup> As mentioned earlier, data users in Serbia in general do not consider the data adequate for economic analysis.

How can the results be so wanting if the methodologies have been improved so much? The fundamental credibility of the figures can only be improved at the source: where the raw data is initially collected. We believe SORS struggles with inadequate source data – both from economic agents and administrative data sources. However, while it readily recognizes problems in coordination with administrative sources, the problems with response rates from economic agents are not sufficiently recognized. Moreover, the absence of this recognition, as well as an administrative approach to statistical procedures inherited from the past, preclude the development of bolder adjustment and imputation methods indispensable under the circumstances.

The IMF statistics assessment does recognize discrepancies in investment figures, and it attributes them to non-coverage of sole-proprietors in the relevant establishment survey (until 2013). It also points to a minor issue in the coverage of household consumption expenditures. We have little doubt that inadequate accounting for sole-proprietors is one of the key difficulties in the SNA statistics overall, not only in investment. However, the data inconsistencies pointed out in this study suggest SORS continues to struggle with the coverage of the enterprise sector as well, albeit to a lesser extent than at the time of the 2006 Study. Moreover, as implied by the Light Peer Review, and underscored by SORS staff in informal communication, SORS also struggles with obtaining adequate information from the general government sector, including something as basic as the full accounting of its units and establishments.

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<sup>17</sup> We have not been able to establish with reasonable clarity why the first tender was cancelled, and what exactly happened with the second one.

<sup>18</sup> The IMF, in its statistical appendix notes some inconsistencies in the full reconciliation of GDP figures from the production and expenditure angles, but they are rather minor.

The key challenge, we believe, lies in an incomplete statistical business registry, and the inadequate treatment of nonresponse to surveys or non-compliance with reporting requirements. Our interlocutors from SORS make vague references to the need to bring the statistics business register more fully in order. This is referred to as something that is being worked on, but we have no information that it is a project with a clear goal and deadline for completion.

The development of an adequate statistical business registry on the basis of the existing BRA (legal) registry must be a daunting task, stretching the resources and expectations of an agency whose statistics concepts were built in a system dealt with an order of magnitude fewer economic agents. There are some 130,000 enterprises submitting financial reports in Serbia today. In addition there are some 180,000 registered sole proprietors that do not submit reports. In former Yugoslavia, Serbia had some 9000 socially owned enterprises. Data for the private shop owners are not available, but their contribution to economic activity was minor and estimated on the margins.

To create an updated statistical business registry SORS needs to, above all, verify the primary activity of a large number of the economic agents as the sector of registration in the Business Registry Agency is reported/circled from a list of choices offered to companies at the time of registration. By law, a company is not allowed to conduct business in areas that it did not register for. Hence, companies typically tend to register for many activities, yet nothing requires, that this prioritization be correct. How far should SORS go in attempting to follow MINECO's example? Should it try to reliably account for the activities of at least the micro enterprises? If not, what kinds of statistical methods with it needs to use to ensure that it aims for the right ones?

Another problem is that in any given year about 4-5% of small to large size enterprises, and some 18% of micro enterprises, do not file financial reports. A good percentage of these companies are probably not economically important, but some are. Moreover, smaller enterprises are more likely to underreport the figures that they do submit. Systematic adjustment for these problems needs to be done, because Serbia's economy has developed relatively few large and medium-large sized enterprises. It needs, hence, to account well for the small ones. The response rate is certainly much lower for reports filed strictly with statistics. In fact, even in the annual financial reports, the Statistical Annex is known to be filled out with a lot less care and attention to detail. This general view has been confirmed in CEVES's experience as it encountered in researching a specific variable (interest paid to banks) that in 50% of the cases when it had not been filled in, the true value was actually not a zero.

We do not have exact information on how these gaps are filled in. For micro enterprises and sole proprietorships surveys are increasingly being done. But is the sampling large enough to take care of the fact that in the heterogeneous Serbian economy different groups of small and medium enterprises might be undergoing very different processes? It does not help that source shares the priors of much of their Serbian intellectual community, whereby not much

economic activity or overall developments are expected from micro enterprises or sole proprietorships.

#### **4. Conclusion**

The national accounts have been much improved since the mid-2000s, but they have been revised many times – often, but not always, due to the introduction of international methodologies. Revisions continue to be frequent, and by more than would be expected – enough to compromise the quality of information on which decisions are being made, as the information is produced. The credibility of national accounts and economic activity information among users is low.

Final, official, data appears to suffer from more than minor internal inconsistencies. There are also indications, most importantly, based on the VAT tax collection performance, that an adequately observed GDP, comparable in coverage with published data elsewhere, could be as much as 10-15% higher than the current figure. Probes into data consistency, and based on basic knowledge about the methodologies applied, do not rule out this possibility, but an unambiguous confirmation that the underestimation of national account magnitudes can be that serious requires much deeper and thorough study, than the present one.

There also appears to be a difficulty in determining the relationship between real growth in output and price changes within the national accounts.

The findings, we believe, are due to the following underlying factors:

- As in other transition economies, the Serbian economic and social structure has undergone drastic structural change and major economic crises. Measuring these changes accurately is inherently difficult.
- Many of the statistical classifications have been revised in recent years to bring them into line with international standards. Despite these efforts at modernization, methods and activity in the data collection and compilation appear to have been held over from the former economic system. These lead to deep-seated continuing problems that become apparent when analyzing the data.
- Problems of coverage appear to be the consequence of an effort to itemize in full detail all economically relevant quantities, entities, and transactions, for what are on a priori basis considered the bulk of relevant economic agents, in an environment where data sources are not obligated in practice (although they are by law) to regularly report. A conviction that it is possible and necessary in a market economy, is a legacy of the peculiar Yugoslav system, in which this was, indeed, possible, even though it was a market economy.
- The massive itemization effort and the effort to align procedures to most sophisticated and minute advancements in international standards draw away resources from:
  - The estimation of magnitudes related to smaller but much more numerous economic agents.

- Development and application of robust statistical estimation solutions to the non-response and underreporting problems, until such time when the broader institutional environment enables the collection of better quality data sources.

In weighing the importance of different aspects of the shortcomings of the data, it is important for the analyst to keep in mind that Serbia's production structure may be unusually skewed towards the provision of services, including their exports, because of Serbia's position (both geographic and cultural) in the region. It may also be unexpectedly skewed towards the production of smaller economic agents, simply because they ought to have picked resources shed by the large enterprise sector, whose production has been in absolute or relative decline for two decades.

## **5. Recommendation**

The first step in improving Serbia's national accounts statistics is to recognize that there is a fundamental coverage problem, that its resolution requires an investment of substantial resources, and an adjustment in approach to the production of economic statistics. This requires a prioritization in the use of SORS's resources as follows:

1. Improving the enterprise survey and the associated business register;
2. Development and application of more robust estimation methods where there are issues of non-response, underreporting or very small economic agents;
3. Introduction of supply / use tables;
4. Changing from real series obtained by aggregating volumes to real series obtained by deflating nominal amounts;

We would suggest a prioritization of the first two, over the latter two items, in case further investigation confirms our suspicion that the bigger problem lay in insufficient accounting for the production of sophisticated services and of small economic agents. If this suspicion were not confirmed, then we would recommend the prioritization of the latter two items. This because the Supply and Use tables and deflator-based volume measures can substantially contribute to the consistency and reliability of the covered data, but their compilation would not necessarily ensure better coverage.

Adopting the above priorities would put under question the timeline for the transitioning from 1993 SNA/ESA 95 to 2008 SNA/ESA 2010. This may be justified, as this is a very substantial resource effort that will produce relatively small data improvements, and result in yet another revision of the entire national accounts data series.

Last but not least, the only way to secure the production of truly reliable and meaningful data is to use them.

The people who use the data most are economists, social analysts and environmentalists inside and outside government. Economists are, obviously, the people who use economic data the most. If they become more aware of the uses of the data, they will demand better statistics. Training in the use of statistics to analyze events in market economies will make this happen sooner than otherwise. And conversely, SORS and other statistics producers need

more support – both technical and financial in applying economic reasoning when developing statistical methods. A project to build capacity and to effect institutional and inter-institutional change could result in substantial improvement in data quality.

A political will to bring about better statistics is, however, the key to unlock change.

One could imagine that, as the national accounts become more credible over the medium-term, given the history of the accounts, users might still shun them. Greater transparency in the continuing technical improvement of the data would help to reduce this risk, and encourage the early development of demand.