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FISH THAT FLY DO EXIST, BUT ARE RARE: ARE THE OFFICIAL LABOUR MARKET DATA MISREAD OR UNRELIABLE?

Postoje ribe koje lete, ali su retke – da li je zvanična statistika tržišta rada pogrešno protumačena ili nepouzdana?

Abstract

In our previous paper, Petrović et al. [7], we showed that large swings in employment since 2008, reported by the Labour Force Survey, were highly improbable and most likely had not happened. Our main arguments were that the official employment data were completely disconnected from other macroeconomic trends, such as economic activity, private consumption or social contribution revenues, as well as that nothing even remotely similar had occurred in any comparable economy. Our conclusions were fiercely challenged in Arandarenko et al. [1], albeit based on (in their words) 'relatively rare' hypothetical cases and on alleged methodological errors, without the authors supplying any empirical evidence for their claims whatsoever. Although the burden of empirical proof was on Arandarenko et al., this time we did their job showing that their hypothesizing is entirely empirically unfounded and that our main conclusions for Serbia still hold. However, what is more important than arguing with hypothesizers, is that the suspicious trends in official employment statistics have continued in 2016, indicating that the disturbing reliability issue has not yet been resolved. Thus, it is a pressing issue for the Statistical Office of the Republic of Serbia (SORS) to come out with revised, correct and credible employment series from 2008 onwards.

Keywords: *employment, economic activity, labour market, Labour Force Survey, Serbia*

Sažetak

U prethodnom radu Petrović et al. [7], pokazali smo da su izuzetno snažne promene zaposlenosti nakon 2008. godine merene Anketom o radnoj snazi teško moguće i da se, po svemu sudeći, nisu desile. Ovu tvrdnju argumentovali smo potpunim odudaranjem zvaničnih podataka o zaposlenosti od drugih makroekonomskih trendova (privredna aktivnost, lična potrošnja i doprinosi za obavezno socijalno osiguranje), kao i činjenicom da se ništa slično, ni u približnoj meri, nije dešavalo u drugim uporedivim zemljama. To je, međutim, pretenciozno osporeno u radu Arandarenko et al. [1], u kom su, umesto empirijskih dokaza, ponuđeni (kako i sami autori kažu) „relativno retki“ hipotetički slučajevi kada je kretanje zaposlenosti kao u Srbiji moguće, uz navodne metodološke greške u korišćenim procedurama Petrović et al. Premda je empirijsko dokazivanje trebalo da bude obavezan deo kritika Arandarenko et al, ali je izostalo, mi smo umesto njih taj posao obavili u ovom radu i tako pokazali da su ponuđene „retke“ hipoteze potpuno neutemeljene, tj. da nalazi naše prethodne studije nesporno važe. Daleko važnije od polemisanja sa tvorcima imaginarnih hipoteza je to da zvanična statistika i u 2016. godini prikazuje sumnjive trendove na tržištu rada, što ukazuje na to da problemi koji dovode do nepouzdanosti tih podataka najverovatnije još uvek nisu otklonjeni. Smatramo veoma važnim da RZS revidira postojeće serije podataka od 2008. godine, kako bi one bile tačne i kredibilne.

Ključne reči: *zaposlenost, ekonomska aktivnost, tržište rada, Anketa o radnoj snazi, Srbija*

Introduction

Official employment records in Serbia measured by the Labour Force Survey (LFS) show two episodes of unusually large swings in the number of employed persons accompanied by relatively minor GDP fluctuations. First, in the period 2008-2012, there was an enormous drop in the number of employed persons, by about 600,000 (from 2.8 million to 2.2 million, approximately 20%), with an increase in the unemployment rate of over 10 pp (from about 14% to about 25%). Second, in the period 2012-2015, a strong growth in the number of employed persons followed, reaching (depending on the series used) between 210,000 and 340,000 (10-15%) with a fall in the unemployment rate of about 6 pp (to about 18%). In Petrović et al. [7], we analyzed these developments and concluded that such major changes in the labour market, in times of economic stagnation, were unlikely and that it was almost certain that they had not taken place, i.e. that the LFS provided insufficiently reliable data on employment trends in Serbia. The main argument for this claim is the convincingly demonstrated fact that the official records on labour trends were completely disconnected from other relevant macroeconomic trends (GDP, private consumption, collection of contributions and income taxes) in both of these episodes. Moreover, the credibility of these official data on labour market trends in Serbia is further challenged by the fact that there is no comparable country in Central and Eastern Europe (CEE) in which an employment decline of approximate magnitude (except perhaps Latvia) was observed in the years that followed the financial crisis of 2008 (although many have gone through a much deeper recession). Similarly, there is no CEE country that has seen such an intense employment growth since the end of 2012 (even though the majority have achieved significantly higher GDP growth). Most importantly, we have not observed the very unusual phenomenon of a complete disconnect between the employment data contained in the LFS and the abovementioned macroeconomic indicators in other comparable CEE countries.

In a critique of our work, Arandarenko et al. [1] argue that there truly is such a complete disconnect in Serbia. In other words, the critics claim that “either the episode

of intensive employment decline in the 2008-2012 period, or the following episode of strong employment recovery” are indisputable, i.e. that they do not stem from unreliable employment measurements in the LFS. They anchor their arguments in a handful of hypothetical examples (admitting themselves, for a few of those to be “unusual and relatively rare”), in which such unlikely labour market trends like the ones recorded in Serbia would be possible, with several objections to the methodology and terminology used by Petrović et al. However, in an attempt to disprove our results, Arandarenko et al. – as a rule – go no further than putting forward these unusual and hypothetical (as well as stylized) examples, never offering any empirical evidence that these hypothetical possibilities have actually occurred in Serbia. Furthermore, they do not quantify the impact of their methodological objections, which makes it impossible, from an academic point of view, to assess whether those objections could potentially affect our main findings and to what extent. Thus, they do not offer anything beyond pure hypothesizing.

In sections 2 through 5, we examine Arandarenko et al.’s critique and provide empirically founded answers for their hypothetical examples. In Section 6, we show that the latest LFS data (i.e. through the first half of 2016) remain suspicious. What follows is a short summary of our arguments which are given at length in the rest of the paper.

Arandarenko et al. open their critique by stating that we are using a “mistaken employment series”, which allegedly led us to faulty conclusions. However, we show (see Section 2 below, Table 2) that the very same “incorrect series” is widely used by IMF, European Commission and World Bank when analyzing employment trends in Serbia. Would that mean that Arandarenko et al. suggest that their analyses are also flawed? Furthermore, these “incorrect series” are extensively used in domestic public arena, and especially in the political circles, to demonstrate “intensive employment decline in the 2008-2012 period” and subsequent “strong employment recovery from 2013 onwards”. It was the very aim of our analysis to show that these developments were highly improbable and the employment series unreliable, or if you wish incorrect. Thus, there is a broader, more significant issue than arguing with

Arandarenko et al., and that is that SORS should produce revised, comparable and correct employment series from 2008 onwards, which is essential both for international organizations and domestic policy makers, but also for the public at large.

Coming back to Arandarenko et al., they carry on their critique by reporting what they believe to be the correct series (“the right panel of Table 1 illustrates the correct employment series” cf. p. 213). But then, their right panel reports two different numbers for employment in 2014: 2,421,270 and 2,544,188 and, unless Arandarenko et al. come out with a persuasive hypothetical example, both numbers cannot be correct. Therefore, at least one of the respective series that the observations belong to (see Table 1 [1, p. 213]) must be, contrary to Arandarenko et al.’s claims, wrong. It is, perhaps, not the best way for Arandarenko et al. to demonstrate their command over data, particularly as this is the only time they refer to data in the paper.

More importantly, a repeated analysis using the data Arandarenko et al. claim to be correct yields exactly the same solution: there is an intrinsic problem in labour market monitoring in Serbia. As shown in Figure 1 (Section 3 below), regardless of employment series used, a record high employment growth in Serbia in the period 2012-2014 that is completely disconnected from GDP growth (indicating high employment elasticity to GDP) was indeed a strange and unique case in CEE. However, Arandarenko et al. believe that this disconnection reflected in employment elasticity of 12.5 (or 20, depending on the series used) is nothing unusual, since in theory this indicator could take any value between minus infinity and plus infinity. To support their belief, they use a hypothetical example of a country experiencing an unusual and relatively rare (as they say) phenomenon of a strong employment increase which is not related to GDP growth. By doing so, Arandarenko et al. incorrectly apply the argument of Kapsos [6] who warns that, for countries with GDP growth close to zero, the employment elasticity may exhibit large swings arising from relatively small changes in the underlying variables, notably employment. Nevertheless, this is not the case in Serbia: however measured, the employment increase by 8.7% or 14.2% could hardly be described as a “relatively

small change”, nor is the GDP growth of 0.7% over the 2012-2014 period close enough to zero to significantly distort the result. Not to mention that Arandarenko et al. do not provide any empirical evidence that such hypothetical example is possible at all, e.g. by showing that it ever happened in a country comparable to Serbia. In fact, the reference that Arandarenko et al. heavily rely on [6] also contradicts them, showing that employment elasticity, apart from some freak cases, remains in the range between 0 and 1 or close to it, just as we have suggested. Strangely enough, in their earlier paper, Arandarenko et al. [2] do state that the “broadest theoretical expected range” for employment elasticity is between zero and one (see p. 154), which leaves us puzzled as to who we should argue with.

Another indication of unreliability of the official labour market data based on the LFS is an even less convincing episode of enormous decrease in the number of employed persons in the period 2008-2012, which amounted to about 600,000 (21%) (see Section 3 below). Again, Serbia clearly stands out as an outlier among all other countries in CEE – although many of them experienced a much deeper recession. The only country which experienced an employment drop of similar proportions was Latvia (15.6%). However, as opposed to Serbia, there is a clear explanation for the steep employment slump in Latvia. It had undergone the deepest recession in Europe during the crisis (in 2009, GDP plunged by 17.7%), while at the same time sharply cutting the public sector employment (from about 8% in the health sector to about 29% in the state administration). Nothing of the kind occurred in Serbia, where 600,000 jobs (as reported by the LFS) disappeared in just four years, while GDP decreased by only 2.2%. Even more awkward is that this alleged employment dive supposedly had to have occurred entirely in the private and informal sector, thus shaving it by almost one-third, as hard data indicate pretty much stagnant (around 750,000) employment in the public sector.

In an attempt to explain how these extreme swings in the Serbian labour market were possible while the economy was stagnating, Arandarenko et al. recourse to yet another empirically unfounded and rather hypothetical example. In their belief, such an enormous drop in employment in the 2008-2012 period could be

seen as a “departure from the mean”, while the recent episode of strong employment recovery could represent a “regression towards the mean”. But again, they do not back up their belief with any empirical evidence. Without a proper econometric test showing that the corresponding time series is oscillating around that mean, i.e. that the series is mean reverting – this statement boils down to an empty and indeed trivial claim: employment decreases in recessions and increases during the periods of economic recovery. Moreover, Arandarenko et al. use this empirically unfounded belief not only to “prove” that the previous episodes of large employment swings were possible, but also to conclude that there was very likely still room for employment to grow faster than GDP. However, without due econometric testing, on which both Arandarenko et al. [1] and [2] remained silent although well-equipped, the argument above is just another hypothetical belief they so often recourse to.

In the following sections, we revisited the issue of the observed disconnection between employment trends and GDP (Section 4), and employment and private consumption and social contribution proceeds respectively (Section 5). These glaring disconnections are just further stark indications of the official employment statistics unreliability. But not for Arandarenko et al.

The relation between employment and output is widely studied and used in economics (e.g. theory of production and growth) and empirically estimated and proven (e.g. production functions), not least by estimating employment elasticity as in the reference Arandarenko et al. extensively use [6]. Still, they dispute this relation in Serbia, claiming that it is conceivable for the employment to grow far above GDP growth over several years in a row. Technically, this implies that employment elasticities are in the double digits over a period spanning several years, even though this is far outside the theoretically and empirically expected range. However, they do not even attempt to provide empirical evidence for such bold claims. They choose to “prove” them by constructing an uncommon example to explain employment growth not accompanied by GDP increase. This alone would probably suffice in discarding the arguments of the hypothesizers as hollow, but we took a step further in Section 4, and

inspected the data for Serbia. Even a rough examination of these data, which Arandarenko et al. were well-equipped to but chose not to perform, convincingly refutes the hypothetical model they have advanced.

Specifically, Arandarenko et al. attempt to explain the high growth of employment with GDP stagnation – allegedly taking place in Serbia, as implied by the LFS data – by a general position and a well-known fact that not all jobs are created equal. No one disputes that not all jobs are created equal, but for employment to grow by 10% while GDP remains almost stagnant, significant and adverse changes should have occurred in the labour market in Serbia after 2012. Particularly, a steep drop in the average work hours and/or productivity would have been needed to offset the impact of a significant employment increase on GDP growth, and such claim should be supported by data. Arandarenko et al. take a step in this direction by constructing a hypothetical example implying the structural changes needed for an employment increase concurrent with GDP stagnation (the diagram with workers in neckties). However, the authors did not attempt, at least indicatively, to test their hypothetical example using the published and readily available data for Serbia.

Had they tried, they would have seen for themselves that there were no indications that such changes in the labour market had actually occurred in Serbia. So we analyzed the data from the LFS in 2012 and 2014 at the lowest level of disaggregation, instead of Arandarenko et al. The data showed that, in the observed period, the number of employees had grown in practically all existing categories monitored – both for above-average and below-average productivity levels (different age groups, lowest and highest education groups, formal and informal jobs, full-time and part-time, paid and unpaid, almost in all activities, etc.). While all these jobs are different, with some affecting GDP growth more, some less, as long as they are all growing – which is what the LFS data indicate – GDP can hardly be stagnating.

In the following Section 5, we addressed the attempt of Arandarenko et al. to refute the discrepancy between the employment trends (as reported by the LFS) and the trends of private consumption and social contribution

revenues respectively by invoking methodological issues. In Petrović et al., we demonstrated these discrepancies and used them as an additional argument (together with the argument on GDP) that the labour market trends, as depicted by the LFS, were unlikely.

We now show, one more time, that the divergence between the official employment data and social contribution revenues is so large that they could be reconciled only if the real salary in the formal sector had dropped from 10% to 20% over the 2012-2015 period. As nothing even remotely similar had occurred, this proves beyond any doubt that these two trends are divergent. Namely, social contribution collection from 2012 to 2015 decreased by over 5% in the real terms, while at the same time, according to the LFS, there was an increase in the number of the formally employed by 11.5% (or about 5%, corrected for the amended SORS methodology). So, in order for these two trends to be reconciled, there would have had to have been a steep drop in real average salary in the formal economy from 2012 to 2015, which is exactly what Arandarenko et al.'s critique implies.

However, by inspecting data on average salary from the RAD survey, which encompasses over 80% of the formally employed, we showed that the steep drop in real average salary had not occurred. Furthermore, by scrutinizing the remaining 20% of the formally employed not covered by the RAD survey, we also demonstrated that the plunge in real average salary could not have happened.

But even a glance at macroeconomic developments in Serbia over the 2012-2015 period would suffice to show that a real salary dive in the formal sector of more than 10% is extremely unlikely. But not for hypothesizers Arandarenko et al., who seem not to grasp that working with data in economics very often implies approximations, and that approximations can be used to prove a point as we did above. Therefore, they should provide numbers showing that the approximation we used did not get the job done, and not just state that "procedure is completely incorrect".

Similarly, in the same Section 5 (and once again, using data), we showed a disconnection between the large increase in the number of persons employed (as reported by the LFS) and the private consumption that saw a real drop of about 2.5% in the 2012-2015 period. Having in mind that

labour income is by far the single most important source driving private spending, it is highly improbable that such a drop in private consumption could happen despite strong employment growth, as indicated by the LFS. The explanation offered by Arandarenko et al. is that the described bizarre trends are possible due to the amendments to the Labour Law in 2014 that reduced job security, producing "negative impact on private consumption". This is an impressive piece of economic analysis, except that Arandarenko et al. do not show that it bears an even distant relevance for Serbia. The affected average wage earner in the private sector in Serbia is a typical 'hand to mouth' case, hardly saving anything. Thus, it takes Arandarenko et al. quite a stretch of imagination to advance that this earner had abruptly decreased its consumption and increased savings, so much so that the total private consumption has decreased considerably in Serbia. Or maybe it is not the pure imagination on behalf of Arandarenko et al., but then it should have been demonstrated by offering even the crudest empirical evidence for Serbia, which – needless to say – is missing again.

In the last Section 6, we pointed out that the substantial employment growth, observed in the latest 2016 LFS data, was highly unlikely. First, this growth is driven by a vast increase in the number of persons employed in agriculture which, as per data in the LFS for Q2, has increased by as many as 106,000 people (y-o-y). The reported increase in employment in the non-agricultural sector also raises doubts as it grows at the annual rate (3.3%) twice as high as the rate of non-agricultural output (1.7%). Nevertheless, as quarterly data tend to be unstable, the assessment should be postponed until additional observations for 2016 are obtained. Still, all conducted examinations, including the explorations of the last available data for 2016, unambiguously show that there are significant and, most likely systemic issues with the validity of data collected and published in the LFS.

Concluding this summary, let us stress that we admire the ability of Arandarenko et al. to come out with a colourful hypothetical construct. Nonetheless, if they, going forward, still fail to offer empirical evidence showing that their hypothetical examples can explain employment

developments in Serbia over the period 2008-2015, any further discussion is useless.

Section 2: One way or another – strong employment growth in a stagnating economy is an illusion, after all

In Petrović et al. [7], we analyzed the official data of the Statistical Office of the Republic of Serbia (SORS) on labour market trends in Serbia from 2008 onwards (shown in Table 1), and they point to two clearly distinct sub-periods. In the first period of 2008-2012, an enormous drop in total employment of about 600,000 (21%) was reported, with the unemployment rate sharply increasing from 14.4% to 24.6%, while in the second, a strong recovery of employment, increasing nearly by 330,000 through 2015 was recorded, accompanied by a sharp drop in the unemployment rate to 18.5%. In Petrović et al., we analyzed employment series through 2014, i.e. the latest available annual data at the time, focusing on the 2012-2014 period with reported employment increase of 315,000 or 14.2%. We showed that this strong employment growth was completely disconnected from other relevant macroeconomic trends over the same period, and hence was most likely just a statistical illusion.

However, Arandarenko et al. [1] claim that our analysis was based on “erroneous rationale” and that we used a “mistaken series”, as it encompasses the originally released annual employment data for 2012 and 2013 and the upwardly revised data for 2014, which have been produced by SORS to ensure forward comparability with the 2015 and later data, not the backward comparability. Moreover, they go one step further, claiming that the “mistaken series”

unfortunately spread from our paper to some of the media and hence wider public. Although we are flattered by the latter statement, Arandarenko et al. are still somewhat exaggerating as to the impact of our paper. Anyhow, as we have reiterated several times, in our analysis we used the current official data on labour market trends for the period 2008-2015, released by SORS and based on the LFS. As such, these data are extensively used in public, whether by the international institutions in their assessments of labour market developments in Serbia (IMF, European Commission and World Bank) or by broader audiences at home – including government officials.

For example, in the first column of Table 2, we present data on unemployment rate from the IMF’s September report (2016) on the fourth and fifth review under the stand-by arrangement that Serbia has with this institution [5, p. 25]. The second column of the same Table gives the employment annual growth rates in Serbia stated in the latest European Commission’s report (2016) about EU candidates and potential candidates’ economies [3, p. 23]. Just a brief overview of numbers shown in Table 2 is enough to convince the reader that the IMF’s unemployment rate series and the European Commission’s employment annual growth rates are identical to those in our allegedly mistaken series in Table 1. Having this in mind, one could say that Arandarenko et al. indirectly imply that the IMF and European Commission used some unofficial labour market statistics in their reports, perhaps from our paper or the media? Furthermore, in its recent report on economic trends in South-East Europe, the World Bank also used the above “mistaken series” while analyzing the labour market developments in Serbia [8, p. 6]. Finally, in the public arena at home, and especially in the political

Table 1: Serbia: Total employment and unemployment rate, 2008-2015

	Employment	Employment (annual % change)	Unemployment rate (15-64)
2008	2,821,724	-	14.4
2009	2,616,437	-7.3	16.9
2010	2,396,244	-8.4	20.0
2011	2,253,209	-6.0	23.6
2012	2,228,343	-1.1	24.6
2013	2,310,718	3.7	23.0
2014	2,544,188	10.1	20.1
2015	2,558,426	0.6	18.5

Source: Statistical Office of the Republic of Serbia, LFS.

Note: The 2015 data are the average for the first three quarters. SORS has, in the meantime, released data for the entire 2015 and then revised its numbers for 2014 and 2015, but to ensure the comparability with our previous analysis, the data available at the time is shown.

circles, the strong decline in unemployment rate in the last several years reported by SORS is most often compared with its record high of 26% in the second half of 2012, meant to show enormous success. However, Arandarenko et al. have remained silent on these cases of “comparing the incomparable”.

More importantly, it could be said that Arandarenko et al. claim that the aforementioned examples (IMF, European Commission, World Bank), apart from our paper, are also based on “erroneous rationale” and therefore flawed. Namely, all these assessments of recent labour market trends in Serbia combine the originally released annual employment data until 2013 with the upwardly revised data for 2014, as we did. According to Arandarenko et al., such an employment series is incorrect because it is constructed by “comparing the incomparable”. In their paper, they argue that there are two correct comparable employment series in Serbia for the period 2008-2015, with the break point in 2014 (as shown in their Table 1 [1, p. 213]): one for the period 2008-2014, and the other starting from 2014 onwards. But there is an intrinsic contradiction in the argument they are trying to make. The contradiction is that Arandarenko et al. claim that both employment data series are correct even though they contain two different numbers of employed persons in 2014, differing by almost 120,000 persons employed. In other words, out of two different numbers of (equally defined) employed persons in 2014, it is impossible that both are correct – one must be “more correct”. Bearing in mind that the latest methodological changes in the LFS introduced in 2015 should have brought about some improvements in measuring employment and unemployment in Serbia, it is reasonable to assume that the upwardly revised value

for 2014 (which is produced to ensure comparability with the data in 2015 and onwards) should be more accurate. This is another reason why we used the revised number, in addition to the fact that the analyzed data set is widely used in public discourse. By showing that these repeatedly used official labour market statistics for the period 2008-2015 are packed with inconsistencies, we wanted to point out that SORS should carefully re-examine existing labour market statistics and revise historical series according to its findings.

Section 3: Comparative evidence: Revisited and confirmed yet again

Although the objection on the employment data set we used, put forward by Arandarenko et al. [1], is highly questionable (if not completely irrelevant), we extended our analysis to encompass the employment series for which they claim to be correct, to check if that would undermine any of our previous findings. In this case, the employment growth rate in Serbia in the period 2012-2014 would amount to 8.7% (instead of 14.2%), while employment elasticity to GDP would amount to 12.5 (instead of about 20).¹

We demonstrate, first, that the use of the “corrected” series has no impact on any of the main conclusions from our previous analysis, i.e. that there is an intrinsic problem in monitoring labour market in Serbia. Namely, in the observed period, whatever the data set, Serbia was the absolute record holder regarding employment growth when compared to other countries of Central and Eastern Europe (CEE). At the same time, this employment growth was completely disconnected from GDP trends, which is an unusual and indeed unique case in CEE.

Table 2: Serbia: Selected labour market indicators, 2011-2015

	IMF (2016)	European Commission (2016)
	Unemployment rate (in percent, 15-64)	Employment (annual percent change)
2011	23.6	-6.0
2012	24.6	-1.1
2013	23.0	3.7
2014	20.1	10.1
2015	18.5	0.6

Source: IMF (2016), [5, p. 25] and European Commission (2016) [3, p. 23]

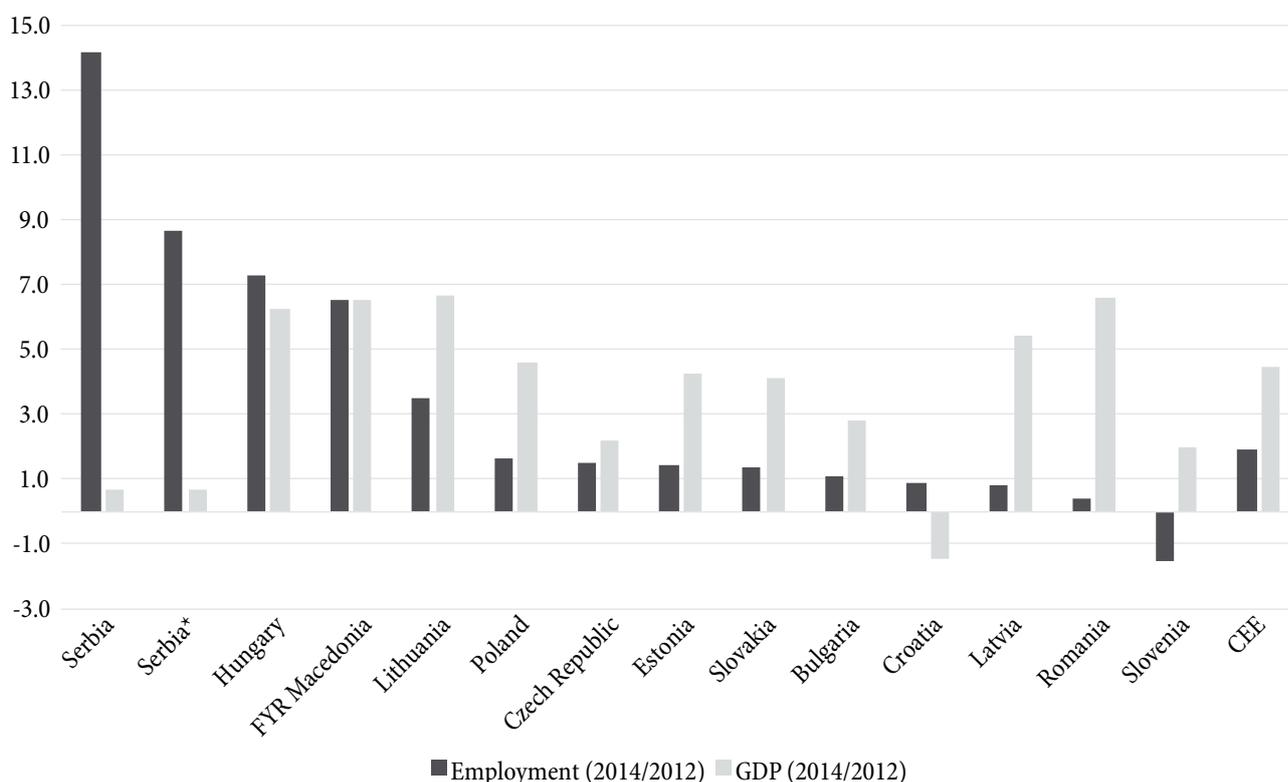
¹ Employment elasticity with regards to GDP shows the change (in percent) in employment with 1% change in GDP.

We show, then, that employment elasticity to GDP is a valid indicator both in Serbia and in CEE economies, and, despite the claims of Arandarenko et al., they should be comparable. In order to show the opposite to be true, Arandarenko et al. come out with a hypothetical example which, in their own words, is “unusual and relatively rare”, but do not offer any empirical evidence that their hypothetical construct is applicable to Serbia. Doing their job, we showed that it is not, and that the employment elasticity in Serbia roughly 30 times higher than the average in CEE economies clearly indicates that something is wrong with the reported employment series in Serbia.

Moreover, as additional indication casting doubts on reliability of the official employment data based on the LFS throughout the whole after-crisis period, we briefly explore perhaps an even less convincing episode of enormous employment drop in the period 2008-2012, which amounted to about 600,000 people (21%). Finally, we demonstrate that Arandarenko et al.’s use of the statistical concept “regression towards the mean” in an attempt to justify reported extreme swings in the Serbian labour market over the period 2008-2015 is nothing more than another empirically unfounded belief.

As can clearly be seen from Figure 1, regardless of which employment data series is used (official or “corrected”), in the period 2012-2014 Serbia was an absolute record holder in employment growth compared to all CEE countries. At the same time, the recent strong employment recovery was completely disconnected from GDP growth (a mere 0.7% over the considered period), which was truly a unique case in CEE. Namely, if we observe the entire group of countries (excluding Serbia), overall employment in CEE increased by 1.9% in the period of 2012-2014, with GDP simultaneously growing by about 4.5%. This means that employment elasticity with regards to GDP amounted to 0.42 in CEE, which is completely in line with theoretical expectations for employment elasticity (ranging from 0 to 1). By individual countries, employment elasticity shows certain discrepancies from the calculated average. Thus, the lowest elasticity was observed in Slovenia, amounting to -0.8 (employment drop of 1.5% with 2% GDP growth) and the highest elasticity of 1.2 was recorded in Hungary (employment growth of 7.3% with a GDP increase of 6.3%). Recognizing that the link between economic growth and employment is obviously not a deterministic one,

Figure 1: Central and Eastern Europe: employment and GDP growth, 2012-2014



Source: Eurostat, SORS

Note: Serbia* represents the employment growth as suggested by Arandarenko et al. No data available for Montenegro, Bosnia and Herzegovina and Albania.

reasonable discrepancies from the theoretical range for employment elasticity are possible in a relatively short term, so obtained results for individual countries could be seen as being in line with expectations. However, regardless of the data used to calculate employment elasticity in Serbia – whether it amounts to 12.5 or to 20, it is obviously far beyond theoretically expected and empirically reasonable values, as well as from values calculated for the comparable countries in the observed period.

However, Arandarenko et al. believe that such a high value of employment elasticity (either 12.5 or 20) is not strange at all because, as they claim, possible boundaries for this indicator are between minus and plus infinity. In deriving this theoretical range of possible values for employment elasticity, Arandarenko et al. rely on findings of Kapsos [6], stating that countries with GDP growth close to zero may exhibit large swings in employment elasticities arising from relatively small changes in the underlying variables. Following this line of logic, Arandarenko et al. conclude that, in this case, even a relatively modest change in employment (in either direction) can push the absolute value of employment elasticity into double or even triple-digit territory. To confirm their belief that employment elasticity could take any value, they present a hypothetical example in which they assumed that GDP growth rate in country A was 1%, and 0.1% in country B, while the employment growth rate in both countries was 5%. In this example, employment elasticity would be 5 in country A, while in country B it is 50. Finally, Arandarenko et al. easily transpose this hypothetical example into reality, concluding that both cases are possible as both countries face unusual (relatively rare) but quite possible phenomenon of similar proportions – a strong increase in employment which is not related to GDP fluctuations. However, looking carefully at Kapsos's argument, one can easily show that the above hypothetical example does not apply to Serbia, and hence that elasticity obtained for Serbia is truly well above the expected range, raising doubts about the reported employment series.

It is clear at first glance that the arguments used by Arandarenko et al. are factually unfounded, as their conclusions are built up (in their own words) on unusual and relatively rare hypothetical cases, while they fail to

offer any empirical evidence that such cases are even possible. First, they use a stylized example in an attempt to demonstrate that employment elasticity with regards to GDP is an unstable and thus unreliable indicator of the link between the two variables over time – instead of demonstrating this claim with empirical episodes in which such extreme employment elasticity values were observed in multi-year periods in other comparable countries. Without this, the described hypothetical example is nothing more but an exercise demonstrating a simple and well-known arithmetical fact – any number divided by a value close to zero yields a very large number.

Second, the hypothetical example presented by Arandarenko et al. is empirically irrelevant for explaining a strong employment growth in Serbia in the period 2012-2014 implied by the official data. It can easily be shown that the methodological remark discussed in Kapsos [6] and used by Arandarenko et al. does not apply in this concrete case, i.e. the remark that countries with GDP growth close to zero may exhibit large swings in employment elasticities arising from relatively small changes in the underlying variables, notably employment. Firstly, regardless of how we measure employment growth in the period 2012-2014 (whether it amounts to 8.7% or 14.2%), this cannot be considered a “relatively small change” by any means. Secondly, even though GDP growth rate was relatively low, 0.7%, it is not so close to zero as to artificially distort the result completely and make it useless. Therefore, it is obvious that the major discrepancy of employment elasticity in Serbia over the 2012-2014 period from either the expected theoretical values or actual values in comparable countries, strongly suggests that the reported market trends are highly suspicious.

It is worth noticing in Figure 1 that Croatia also exhibited a disconnection between employment and GDP trends during the period 2012-2014, although not as prominent. Namely, in the aforementioned period, there was a relatively small employment growth of around 0.9%, despite the fact that Croatian economy was in recession and that the cumulative drop of GDP equalled to 1.4%. If we were to include the following year (2015), when employment grew by 1.4% and GDP by 1.6%, Croatia would become such a “freak case” for which employment elasticity would

have to be cautiously interpreted according to Kapsos, because the denominator of this indicator is close to zero. Despite relatively small (and quite possible) changes in employment and GDP in the period 2012-2015 (2.2% and 0.2% respectively), in this case the value of employment elasticity would be well beyond the expected range.

Summarizing arguments on employment elasticity, it seems that even Arandarenko et al. agree that their empirical estimates vary mostly between zero and one, since they extensively cite Kapsos [6], who reports these estimates. Moreover, in their previous paper, Arandarenko et al. [2] state that the “broadest theoretical expected range” for employment elasticity is between zero and one (see p. 154), and we could not agree more. But then they suddenly forget all this, and start coming out with freak examples that are empirically irrelevant for Serbia, as we have just shown.

Another indication casting doubts on reliability of the official employment data based on the LFS throughout the whole after-crisis period is an even less convincing episode of enormous employment drop in the period 2008-2012, which amounted to about 600,000 people (21%). Again, Serbia clearly stands out as an outlier regarding the intensity of employment drop among all other countries in CEE – although many of them experienced a much deeper recession. Perhaps the only country that faced the employment decline of similar proportions was Latvia (15.6%). However, Latvia, as opposed to Serbia, experienced the deepest recession in Europe during the crisis (in 2009, GDP decreased by 17.7%), hence the observed significant employment drop is expected. In addition, Latvia carried out one of the most ambitious fiscal consolidations in Europe, sharply cutting employment in its public sector: in the health sector by about 8%, in the education sector 14% and in the state administration about 29%. Thus, there is a convincing explanation for the large dive in employment in Latvia. However, for Serbia, there is no such obvious or rational explanation on how 600,000 jobs could have disappeared in just four years (as reported by the LFS), while GDP decreased by only 2.2%. What makes this Serbian episode even more unusual and highly improbable is the fact that this steep employment drop must have happened almost entirely in the private and informal

sector. Namely, there are reliable data on employment in the public sector showing that the number of employed persons in this part of the economy in the period 2008-2012 was pretty much stagnant (around 750,000).² This means that the reported employment drop of about 600,000 had to have happened in the much smaller sample of about 2 million employed persons and not in the total number of employed persons of 2.8 million, which includes the public sector. In other words, employment in private (and informal) sector dropped by almost one-third, which would almost certainly mean that the Serbian economy was plummeting – but it was not the case, since in the observed period GDP declined by only 2.2%.

Again, Arandarenko et al. are not impressed with absolute numbers, claiming that the described extreme movements in the labour market in a stagnating economy from 2008 onwards are in no way strange. In their opinion, such an enormous drop in employment in the 2008-2012 period could be seen as a “departure from the mean”, while the recent episode of strong employment recovery could represent “regression towards the mean”. As usual, Arandarenko et al. are just hypothesizing without supplying any empirical evidence to support their beliefs whatsoever. Needless to say, without proper econometric testing that would confirm that corresponding time series is oscillating around that mean, i.e. that series is mean-reverting – this statement boils down to an empty and indeed trivial one: employment decreases in recessions and increases during the periods of economic recovery. But it is not something we disagree about. As a reminder, the issue is whether the episode of intensive employment decline in the 2008-2012 period (while unemployment rate grew from about 14% to about 25%) and the following episode of strong employment recovery (while unemployment rate sharply dropped to about 15%, according to the latest data) actually happened in Serbia. Furthermore, Arandarenko et al. use their empirically unfounded belief not only to “prove” that the previous episodes of large swings in employment are possible, but also to predict the future developments in the labour market. Since cumulative employment drop in the

² This is a conclusion we reached by analyzing expenses for general government employees, financial reports of SOEs, including the companies from the portfolio of the Privatization Agency.

period 2008-2014 exceeded the cumulative drop in GDP, despite the recent increase in the number of employed persons, they conclude that it is very likely that there is still room left over for “regression towards the mean”. In other words, they expect a continuation of strong employment expansion that is completely disconnected from GDP growth and, perhaps, other relevant macroeconomic trends. Thus, even projections Arandarenko et al. make are based on empirically unfounded relations, and in that respect, no doubt they are consistent.

Section 4: Why can't the blanket statement “Not all jobs are created equal” explain the complete disconnect between employment trends and GDP?

In an attempt to explain the complete disconnection between labour market trends and GDP, which they see no problem with, Arandarenko et al. [1] offer the well-known quip that “not all jobs are created equal”. The explanation, however, is hollow if not supported by empirical evidence that would show why Serbia is the only country in which there have been extreme changes in employment not accompanied by corresponding GDP trends (Figure 1). Instead of empirical evidence, time and again Arandarenko et al. offer rare hypothetical examples to demonstrate how it is possible for employment to grow without affecting GDP. However, not only it is very unlikely that these rare hypothetical examples have been occurring in Serbia year in, year out, but a mere scratch at the surface of these explanations reveals that they are not even supported by the official data.

Perhaps the best illustration of the methods used by Arandarenko et al. to disprove the findings of our previous paper is “impute, then refute”. For example, they state that Petrović et al. said or implied that: “...the employment increase of 10% automatically translates into 10% increase in output...”³ On the contrary, we considered a relatively wide range of employment elasticities that are different from one.

What we are actually claiming is that there has to be a relation between employment and GDP, and even if such a relation is disrupted in some cases, it is unlikely that this would keep reoccurring several years in a row. The relation between employment and output is widely studied and used in economics (e.g. theory of production and growth) and empirically estimated and proven (e.g. production functions), not least by estimating employment elasticity as in Kapsos [6], the reference Arandarenko et al. extensively used. However, according to the LFS results, the relation has practically been inexistent in Serbia since 2008, as the employment and GDP exhibited divergent trends.

As an explanation of how it would be possible for GDP in Serbia to remain stagnant with an employment growth of 10%, Arandarenko et al. construct a hypothetical example and illustrate it with stylized images of workers in neckties, without bothering to show that the construct is empirically relevant for the analyzed Serbian episode. In their hypothetical construct, as a new employee is hired, the remaining employees have to, at the same time, reduce their hours worked in order to compensate for the output of the newly hired employee. In this manner, the employment growth does not lead to an increase in the overall number of working hours or output. Even though the example is purely hypothetical and unlikely, particularly over a period spanning several years, it actually does a pretty good job defining the conditions under which a significant increase in employment would be neutral in terms of GDP growth (which is what the Serbian LFS shows). Namely, workers would have to considerably decrease their average working hours and/or productivity, which would then neutralize the impact of a significant employment increase on GDP. This hypothesis, if it were true, would also point to significant and very adverse structural changes in the labour market from 2012 onwards, lending itself to empirical testing. As expected by now, Arandarenko et al. do not bother offering even a crude empirical indication that their hypothesis holds in Serbia.

So, let us do their job for them, and look at the actual data for Serbia. We took the example that Arandarenko et al. also mention in their paper (although for other purposes), which is relevant to the aforementioned

hypothetical example. From 2012, according to the LFS, the number of persons in part-time employment increased above average, reducing the average work hours in the economy. The information does roughly follow the line of the hypothesis set by Arandarenko et al., but can still not serve as a sufficient argument for the Serbian GDP stagnating while the employment grows significantly. This is because persons employed on a part-time basis still contribute to GDP growth. Thus, even with an increase in the number of employees with part-time employment only, *ceteris paribus*, GDP would still have to grow. Therefore, accelerated increase of part-time jobs could only be an argument supporting a somewhat slower growth of GDP compared to employment growth, which could be accepted, within a reasonable range. To explain an almost stagnating GDP while employment swiftly grows, as has happened in Serbia, it would have to be empirically shown not only that the number of part-time employees increased intensively, but also that relatively significant negative structural changes have occurred in the labour market, over several years, in a wider population – e.g. a decrease of the number of persons in full-time employment.

This, in turn, means that a good test that would show whether a swift growth in employment in Serbia has indeed been accompanied by almost stagnant GDP would be to see, for example, if the number of full-time employees had significantly dropped in the period from 2012 to 2014. If so, that would serve as a good foundation for an argument-supported claim that the expected GDP increase due to newly hired employees was compensated by having all the employed persons work shorter hours, leading to a stagnation in the number of man-hours with an increase in employment (like in the hypothetical example of “workers in neckties”). Of course, absolute precision is not required, only a clear indication that such changes in employment structure have occurred and that these changes support the hypothesis presented as a possible explanation for the complete disconnect between the employment trend and GDP. However, the actual data for Serbia do not even remotely support this; on the contrary, full-time employment has actually grown by quite a bit and certainly significantly faster than GDP.

Going down to the lowest level of disaggregated data from the LFS in 2012 and 2014, it can be seen that it is unlikely that there has been any negative structural change in the number of man-hours and/or productivity that would explain why GDP was almost stagnating hand in hand with a strong growth in employment. Namely, in the period 2012-2014, detailed data from the LFS show that employment grew in practically all existing categories monitored – men and women, different age groups, lowest and highest education groups, formal and informal jobs, full-time and part-time, paid and unpaid, almost in all activities, etc. Therefore, all these jobs are indeed different and have a different impact on GDP, but as long as they are all increasing – which is what the LFS data imply – it is unlikely that GDP in Serbia would be stagnating. This unambiguously shows that the claim made by Arandarenko et al. that the GDP has stagnated with a large increase in employment in the period 2012-2014 because “not all jobs are created equal”, is absolutely empirically unfounded.

Section 5: Are divergent trends between the reported employment and related macroeconomic aggregates “alleged” or real?

As an additional argument used in our previous paper [7] to demonstrate unreliability of the official employment data from the LFS, we showed that that these employment data were completely inconsistent with the trends in private consumption and social contribution revenues. Namely, with a steep employment growth, it is highly unlikely that private consumption would be declining, as labour income presents by far the largest individual source propelling personal consumption. Similarly, it is unlikely that there would have been a real drop in social contribution collection when formal employment and wages were on the rise. Nevertheless, the LFS data allege that these unlikely events have occurred in the period 2012-2015, and Arandarenko et al.[1] claim that these trends are not inconsistent, or at least that they cannot be proven so. Their main argument is that the data from the LFS cannot be put in line with personal consumption and contribution collection trends for methodological reasons. We will show this to be incorrect, i.e. that the

approximations we used for these comparisons are reliable enough and that the complete disconnect of the LFS data from the aforementioned macroeconomic aggregates is indisputable, which is another strong argument supporting the thesis that the LFS data are invalid.⁴

Discussing the divergence of contribution revenue trends and formal employment trends as reported in the LFS, Arandarenko et al. state that these indicators cannot be cross-referenced, as there are no data available on average salaries in formal employment from the LFS. Namely, the contribution collection should follow the wage bill trend for the formally employed, i.e. the number of employees multiplied by their average salary. However, we used data on average salaries in the registered employment measured by the RAD survey (until 2015) as a good approximation on the average salary trend for the formally employed. The difference between formal and registered employment is the following: formal employment in the LFS, unlike in the RAD, also encompasses those formally employed in agriculture (farmers with registered agricultural households and their family members with paid social security contributions); formal jobs in the army and the police; persons formally employed on the basis of temporary and service contracts. In addition, LFS counts the employees performing several jobs once, while RAD registers each job separately. Formal and registered employment (LFS and RAD) overlap by over 80%. Despite the fact that, even at first glance, the difference between the two seems too small to completely overturn our main findings, Arandarenko et al. label our procedure “completely incorrect” – since, in their opinion, ignoring the differences between the two can lead to poor results. However, Arandarenko et al., as usual, do not quantify their hypothesis using data, even though they should have, if they earnestly wanted to

prove that their methodological objections alter the main findings of our analysis.

Had they done so, they would have seen immediately that the discrepancy between the contribution revenue trend and the calculated wage bill trend for formal employment was simply too large (about 13 pp) to be explained by the difference in collection scope lower than 20%. Namely, for Arandarenko et al.’s critique to hold, the average salaries in the formal employment segments excluded by the RAD survey would have to have more than halved from 2012 to 2015, or there would have to have been a substantial employment growth (over 100%) in low-paid jobs (e.g. formal agriculture employment). The simplest way to show that the former had not occurred is to refer to the salaries in the army and the police, which were increasing as prescribed by legal indexation, while the number of employees had not changed dramatically. For the formally employed in agriculture, we do not have direct data at our disposal, but based on detailed tax data on contribution collections from persons working in agriculture,⁵ we can see that there are no unusual trends from 2012 to 2015 that would have affected our approximations.

Formal employment in agriculture, army and police represents by far the largest groups of employees comprising the difference between the LFS and RAD scopes. The remaining difference between the scopes of the two is so low that there is no need to further test the erroneous hypothesis of Arandarenko et al. that the average salary from the RAD research was inapplicable to the calculation of the wage bill for formal employment from the LFS in the period 2012-2015. Not only was the procedure used by Petrović et al. not “completely incorrect”, but, as we demonstrate, it was very precise for the observed period, and the contribution revenue trend was, beyond any doubt, completely disconnected from formal employment trends reported in the LFS.

To avoid repetition (see Sections 2 and 3), we shall skip detailed discussion of the objections by Arandarenko et al. that we had failed to take into consideration the alterations in the LFS methodology in 2014. The objection is unfounded due to several reasons. First, we used the

⁴ One of the objections of Arandarenko et al. was that we were backing up our suspicions of the reliability of the LFS data by comparing them with other sources, without questioning the reliability of the said other sources. However, this is not correct. The data on the contributions collected were taken from the budget and are completely precise and valid, while the data on the personal consumption trends were taken from the statistics of the national accounts for which there are no concerns (unlike the LFS) of significant distortion of real trends. The data from the national accounts are consistent with all other macroeconomic aggregates (except the LFS data).

⁵ Contributions for the persons employed in agriculture have grown nominally by 13.5% from 2012 to 2015.

only official employment data for 2015 and 2012, used by all relevant international institutions as well as in the relevant public discourse. Second, it is undisputable that when we correct the number of the formally employed for the difference introduced by the new methodology, we still get divergent trends for formal employment as reported in the LFS and the contribution revenue trend, with only a decrease in its discrepancy.⁶ We have discussed this objection by Arandarenko et al. in greater detail in Sections 2 and 3.

Arandarenko et al. make completely irrelevant methodological objections to the procedure we used to demonstrate that the LFS data were inconsistent with the personal consumption trend, most likely stemming from their failure to understand this procedure correctly (even though we think the explanation was sufficiently clear). Instead of responding to the said methodological objection, we shall demonstrate one more time, in somewhat greater detail, how we arrived at the conclusion that the employment growth presented in the LFS implied a nominal growth of labour income per household of at least 20% in the period 2012-2015.

Let us classify all persons employed in Serbia into three categories: 1) formally employed, 2) informally employed with labour income and 3) unpaid family workers. Of all the groups, the number of employees in the first category (formally employed) was by far the greatest (about 2 million out of 2.5 million) and according to the LFS, it showed the slowest growth in the period 2012-2015 (11.5%). The second category (informally employed with some labour income) is significantly smaller than the category of the formally employed (about 300,000) and it showed, as indicated by the LFS, a remarkably quick growth in the period of 2012-2015 by about 30%. Unpaid jobs, i.e. the third category, do not affect household labour income by definition, neither for 2012 nor for 2015, and are thus irrelevant for our analysis. Being that employment in the first and largest category (the formally employed) showed the slowest growth from 2012 to 2015 (11.5% compared to

over 30% in the second category), we concluded that the employment trends from the LFS implied that household labour income had grown at least in line with the growth of income from formal employment. Taking into consideration the growth of salaries, the growth of income from formal employment nominally amounts to about 20%.⁷

As labour income comprises (according to the Household Consumption Survey) almost half of the disposable income used by households to fund their consumption, the nominal labour income growth of at least 20% (and real growth of around 10%) implied by the LFS was completely disconnected from the real decrease of personal consumption of about 2.5% from 2012 to 2015. Of course, we have also considered the trends of other sources of household income from 2012 to 2015, which are individually much smaller than labour income and for which there are reliable data – a real decrease in pension income (about 7%), but also a real increase in income from remittances, social security, etc. – which Arandarenko et al. state as a possible reason for the decrease in personal consumption regardless of the high employment growth. With a labour income growth over 20% (10% real growth), all other sources fuelling consumption would have to have decreased from 2012 to 2015 by 10% in real terms for the results to be consistent with a drop of 2.5% in personal consumption; the data show nothing even remotely like this.

We shall now go back to the methodological objections of Arandarenko et al. to our conclusions. The objections pertain to our supposedly erroneous calculation of an average “hypothetical” salary in the economy “...if for no other reason, then because of almost 10% of unpaid family workers within the LFS employment”.⁸ In the previous paragraphs we have, however, shown that we had not calculated the “hypothetical” salary in the economy at all, nor did we need to use data on the number of unpaid family workers within the LFS employment. Instead, we chose to estimate the labour income growth implied by the LFS using the most conservative method available,

⁶ Trends remain divergent even with the correction of data for the modifications in the SORS methodology, because the contributions have seen a real drop in the period from 2012-2015, and the wage bill has seen an increase. The correction only reduces the difference between the two from about 13 pp to about 6 pp.

⁷ We have already shown that the average salary from the RAD serves as a fairly good approximation of the trends in average salaries for the formally employed. If we were to take into consideration the change in methodology, the number would be decreased to under 15%, which has no impact on any of the conclusions reached by this analysis.

⁸ Page 218

based on the available data (and even so, obtained a complete discrepancy between the employment and private consumption trends).

Setting hypotheses not tested by the data is a standard part of the argumentation by Arandarenko et al. With all other explanations on pension cuts and decreases in other sources funding consumption (which we also considered in our analysis), which could hypothetically explain how it would be possible to see a substantial growth in overall employment and a significant drop in private consumption at the same time, Arandarenko et al. note the adoption of the Labour Law in 2014 as an additional reason for the drop in personal consumption. The authors, among other things, claim: "...there must have been an indirect negative impact on private consumption as a consequence of reduction in job security – or at least because of the widespread perception of increased job insecurity." This actually implies that the adoption of the new Labour Law increased [the perception of] job insecurity, leading to lower consumption (i.e. higher savings), which affected private consumption. We feel that, prior to postulating such a claim, the authors ought to have explored which category of employees in Serbia had become more endangered due to the amendments to the Labour Law. This, for example, could easily be the employees with below-average salaries, spending all they earn and having no room for savings. In addition, it would be good to check if there has been an increase in savings among the population that would be consistent with this hypothesis. It is also interesting to note that construction of such hypotheses actually shows that Arandarenko et al. are nevertheless aware (even with all the criticism of our approximations) that the strong growth of employment since 2012, as portrayed by the LFS, is inconsistent with the drop in personal consumption and that an explanation for these disconnected trends must be provided.

To conclude this part, we still feel that this, as well as other numerous untested and unlikely hypotheses offered by Arandarenko et al. in an attempt to explain why the employment trends in Serbia were completely disconnected from macroeconomic aggregates, are still somewhat less likely than the hypothesis that the LFS fails to measure employment trends with sufficient reliability.

Section 6: The latest employment data for 2016 still raise doubts on reliability of the LFS

The latest LFS data for 2016 suggest that the disconnect between the employment trends and GDP continues. According to the data for the second quarter of 2016, the overall number of persons employed has increased by about 174,000 compared to the same period in the previous year, i.e. by 6.7%. At the same time, GDP growth was three times smaller, amounting to 2%. Additional argument that raises suspicion about reliability of the published data is the fact that the growth of social contribution revenue by 4.1% can be completely explained by the increase of the average salary (that has risen by 4.2%) and not by the growth of formal employment (as indicated by the LFS). Bearing in mind that there could be some volatility in the quarterly data (although smaller than this), we emphasize that this should be treated as our preliminary assessment. However, if similar trends were to continue in the upcoming quarters, this would undoubtedly reinforce our findings and indicate that the data series from the LFS are still seriously flawed.

Within the overall Q2 employment data presented, those showing a high increase in employment in agriculture are least convincing, while the growth of employment in non-agriculture is unusually high, but still within some realm of possibility. Of the overall employment increase by about 174,000 persons, the LFS data show that over 60%, i.e. 106,000 have been employed in agriculture. Increase in the number of the employed in agriculture of over 100,000 persons (over 20%) in only a year is very unlikely and will be further discussed below. The growth of employment in sectors other than agriculture (68,000 persons) is somewhat lower, but still out of the ordinary. Namely, employment growth (net of agriculture) rose twice as fast as the non-agricultural output (GVA), 3.3% compared to 1.7% (y-o-y). Furthermore, the analysis of trends in formal (non-agricultural) employment from the LFS shows that it has increased significantly faster than the relevant (non-agricultural) contribution revenues.⁹

⁹ Taking into consideration the change in average salary as well.

Table 3: Employment trends (overall and in agriculture) and other related indicators, 2015-2016

	2015 Q1	2015 Q2	2016 Q1	2016 Q2	2016 Q2 / 2015 Q2
Employed persons					
		in 000			in %
Overall	2504	2588	2571	2762	6.7
Excluding agriculture	1978	2046	2001	2113	3.3
In agriculture	526	542	570	648	19.6
Informally in agriculture	317	320	351	403	26
Formally in agriculture	209	222	219	246	10.5
Average gross salary					
		in dinars			
Overall	57,447	61,440	60,024	64,001	4.2
Social contributions					
		in millions of dinars			
Overall	115,618	125,902	120,522	131,011	4.1
GDP					2.0
GVA in agriculture					4.3
GVA (non-agriculture)					1.7

Source: SORS and the Ministry of Finance

Data on agricultural production indicate that it will achieve a gross value added growth of about 5-10% in 2016, predominantly as a result of more favourable weather than in the previous year (2015 drought). If it were to be assumed that there has truly been an increase of the number of employees in the agricultural sector of about 20%, which is what the LFS shows, this would further imply that there has been a large drop in agricultural productivity or an enormous change in its structure (increase of the share of labour-intensive activities), which is not very likely. Due to mechanisation in agriculture, the agricultural production growth no longer requires a multi-fold increase in employment, as shown by the LFS. In other words, more favourable weather conditions have afforded a larger yield in agricultural crops and the increase in value added in agriculture, but higher yields do not even lead to a proportional increase in the number of employees in agriculture, let alone to a 20% increase.

As an additional indicator showing that measurement of the number of employed persons in agriculture in Q2 is unreliable, we observed social contributions paid in by formally employed farmers. These contributions show a nominal growth of only 2.5%, which is not even remotely close to the high growth of (formal) employment in agriculture, of over 10% (Table 3). Therefore, the most likely explanation for an extremely high growth of employment in agriculture, leading to a relatively high growth in employment overall in Q2, is to be found in the unreliability of the LFS measurements – indicating

that most probably there are significant and, by all means, systemic issues with the validity of data, collected and published by this survey.

References

1. Arandarenko, M., & Aleksić, D. (2016). Not all jobs are created equal: How not to misread the labour force statistics in Serbia. *Ekonomika preduzeća*, 65 (3-4), 211-224.
2. Arandarenko, M., Kovačević, M., & Aleksić, D. (2016). Kretanje zaposlenosti u Srbiji: Između tražnje za radom i ponude rada. In *Ekonomika politika Srbije u 2016. godini* (pp. 151-175), NDES.
3. European Commission. (2016). EU candidate & potential candidates' economic quarterly (CCEQ): 3rd quarter 2016. *Technical paper 012*, October 2016. Retrieved from http://ec.europa.eu/economy_finance/publications/eetp/pdf/tp012_en.pdf
4. Fiskalni savet. (2014). Pregled uspešnih fiskalnih konsolidacija u Evropi: mere, efekti i poruke. Retrieved from http://www.fiskalnisavet.rs/doc/analize-stavovi-predlozi/pregled_uspesnih_fiskalnih_konsolidacija_u_evropi_mere_efekti_i_preporuke.pdf
5. IMF. (2016). Fourth and fifth reviews under the stand-by arrangement and rephrasing of the arrangement – press release, staff report, and statement by the executive director for the Republic of Serbia. IMF Country Report No. 16/287. Retrieved from <http://www.imf.org/external/pubs/ft/scr/2016/cr16287.pdf>
6. Kapsos, S. (2005). The employment intensity of growth: Trends and macroeconomic determinants. *Employment strategy papers*, 12.
7. Petrović, P., Brčerević, D., & Minić, S. (2016). Economic recovery, employment and fiscal consolidation: Lessons from 2015 and prospects for 2016 and 2017. *Ekonomika preduzeća*, 64 (1-2), 53-72.
8. World Bank. (2016). Resilient growth amid rising risks. SEE RER, No. 10, fall 2016. Retrieved from <http://pubdocs.worldbank.org/en/521981474898709744/SEE-RER-Report-Fall-2016.pdf>



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