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Investment Needs and Debt in the Western Balkans

From an Harrodian growth approach to the building of a stock-flow Post-Keynesian model

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Claude Berthomieu, Massimo Cingolani, Anastasia Ri †

Abstract

The six Western Balkan economies (Albania, Bosnia and Herzegovina, Kosovo, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia) as well as Croatia (now member of the European Union) were heavily damaged by the civil wars during the 90s. They had a period of good growth between 2000 and 2008 but have been hardly hit by the world-wide crisis since then. Moreover, Bosnia and Herzegovina and Serbia suffered from the strong floods of the spring of 2014 that seriously damaged their infrastructure.

2014-2020 will be for the Western Balkans a period of preparation to entry into the European Union, which is not expected after 2020, while for Croatia it will be the first one as a full EU member. In this paper we argue that in both cases a substantial investment program in the medium term is an essential condition for the future economic development of the region and a pre-requisite for its further integration in the EU.

In order to estimate and justify the size of the required investment effort (comprising both public infrastructure and private sector) in the six (plus one) countries studied, in the first part of the paper a simple model of the "investment-production-growth" relationship in the Harrodian tradition is proposed. In the second part, we attempt to measure the financing implications of such an investment program by measuring its impact on debt levels, both public and private, through a simple macroeconomic "stock-flow" consistent model. We show that the main portion of the resulting debt increase is due to the change in private debt and that the latter appears manageable given the growth associated with the investment program. Public debt increase is relatively modest in proportion to GDP due to the fact that the large investment stimulus boosts growth and consequently fiscal revenues with the result that the share of the public sector in the total debt increase is much lower than the share of public investments in the total change in investment.

- Key words: investment, public debt, stock-flow models, Western Balkans
- JEL codes: E12, E22, E27, H63

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Introduction

The countries of the Western Balkans[1] are going through difficult times. Already heavily affected by the recession associated with transition and the civil wars during the 90s, which left a heavy political, social and economic heritage, the region was hardly hit by the global economic crisis after 2008. In 2009 economic activity shrank by 6.95% in Croatia, by 5.7% in Montenegro, by 3.5% in Serbia, by 2.83% in Bosnia and Herzegovina and by 0.92% in Macedonia; only Albania and Kosovo experienced positive real growth rate. The second wave of the crisis in 2012 pulled down the feeble recovery of the 2010-2011 and average real growth rate in the six Western Balkans countries attained -0.6% and -2.2% in Croatia [World Bank (2012), (2014a,b), Eurostat]. Since, then the smaller countries of the region returned to growth, while the largest economies, Croatia, Serbia and Bosnia and Herzegovina, were all hardly hit by the massive floods in May 2014 and experienced once more negative growth last year (according to forecast data, GDP contracted by 2% in Serbia and by 0.2% in Bosnia and Herzegovina, Croatia's real growth rate is estimated to be -0.7%[2] in 2014).

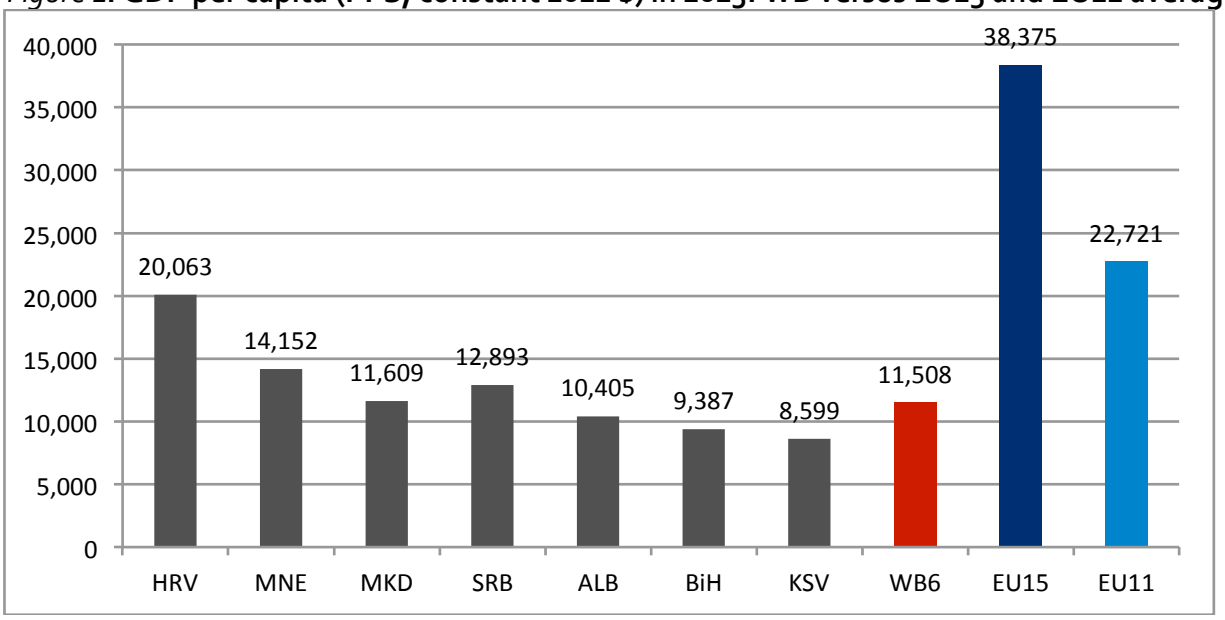
At the same time, the Western Balkans are facing important challenges. Completion of economic and institutional transition through structural reforms, integration of the *EU acquis*, catching up process to higher per capita income levels, unemployment, poverty and inequalities, infrastructure modernization and future successful integration into the European Union[3] are going to be a real test for the region given current circumstances and global instabilities. Addressing all these issues at once is hardly possible without sustained economic development. Income disparities between the Western Balkan countries and the EU members are still very high, despite a considerable progress achieved in the 2000s. Average GDP per capita in PPS terms[4] in the six Western Balkan countries grew from 20% of the EU-15 average in 2001 to about 30% in 2014. However, the progress is less obvious comparing to the income level of the new member states (EU11) as they grew faster during the same period to attain about 60% of the EU15 average (cf. *Figures 1 and 2*). In nominal terms, GDP per capita is still lower: thus, it attains only 19% of the EU28 average in Montenegro, 16% in Serbia, 14% in FYR of Macedonia, 13% in Bosnia and Herzegovina, 12% in Albania and 11% in Kosovo. Therefore, to reach EU living standards, sustained growth is needed.

As pointed by Bartlett and Uvalic (2013), "most observers doubt that the period of rapid growth that took place before the onset of the crisis will return; consequently, without adequate policy interventions, the SEE (South East Europe) countries in general[5] risk to face a protracted period of slow growth, leading to widening social problems and deepening social exclusion of significant proportions of their populations", a rather gloomy perspective.

[1] This paper is focusing on six Western Balkans countries (Albania, Bosnia and Herzegovina, Kosovo (under UN Security Council Resolution 1244), the Former Yugoslav Republic of Macedonia, Montenegro and Serbia), hereafter **WB6**, plus Croatia.
[2] For Croatia, DG ECFIN autumn 2014 forecast; for Serbia and Bosnia and Herzegovina, World Bank estimations as of December 2014 [World Bank (2014b)].
[3] The Western Balkans are at different stages of the EU accession process. Albania, FYR of Macedonia, Montenegro and Serbia obtained candidate status for the EU membership while Bosnia and Herzegovina and Kosovo are considered as potential candidates. Croatia joined the EU on 1st July 2014.
[4] Purchasing Power Standards (PPS).
[5] Comprising also Romania and Bulgaria

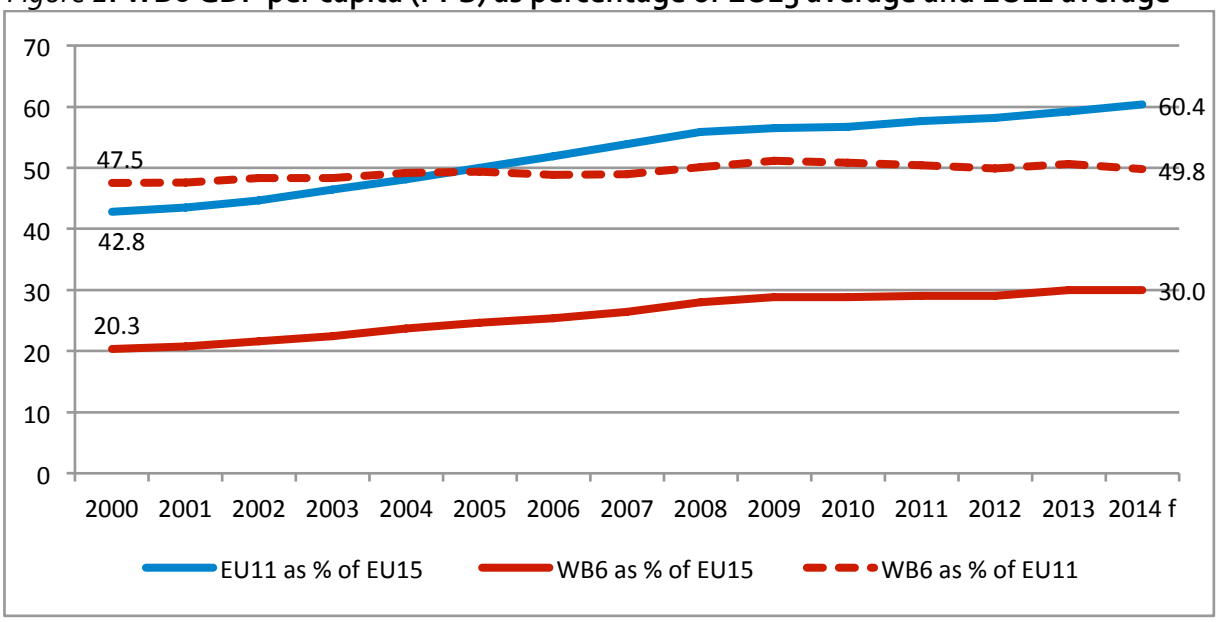
In this paper we argue for a positive approach to economic development in the region under study, which will only take place if a substantial investment effort is made in the medium term. This substantial effort concerns both private and public sectors.

Figure 1. **GDP per capita (PPS, constant 2011 $) in 2013: WB versus EU15 and EU11 averages**



Source: World Development Indicators
Note: WB6, EU15 and EU11[1] are GDP weighted averages.

Figure 2. **WB6 GDP per capita (PPS) as percentage of EU15 average and EU11 average**



However, as relatively modest FDI inflows to the region can be expected (compared to Central and East European countries before the crisis), private external capital will be slow and reluctant to come to the

[1] The group of **EU15** countries comprises: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom; **EU11** refers to the 10 European Union (EU) member states—Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia—and the latest member State - Croatia.

region, particularly at times of economic turmoil. Therefore, public investment in infrastructure, physical and social, boosting productive capacities and favoring human capital development, should play a catalytic role for private investment. The focus on infrastructure is obvious, as the physical capital stock inherited from the socialist past is aged and sometimes obsolete, partly destroyed or damaged during the conflicts and by natural phenomena and has been lacking appropriate maintenance during several years. Inevitably, an important program of investment raises the question of its financing. The crisis deteriorated public finances in all countries of the region increasing its public debt levels. Consequently "limited fiscal space" is perceived as a binding constraint, difficult to override.

The objective of this paper is thus twofold. First it aims at estimating global (private and public) investment needs in order to achieve a relatively high economic growth essential to respond to the challenges the Western Balkans are facing. Secondly, it addresses the financing issue by evaluating the debt variation that such investment would generate. For this purpose, *in the first part*, we propose a simple model of the "investment-production-growth" relationship in the tradition of Harrod to estimate and justify the substantial magnitude of the investment needs in the six (plus one) countries studied. Then, *in the second part,* the construction of a post-Keynesian model of the "stock-flow" type is proposed for simulating a consistent financing program to cover these needs (through public and private debt), taking into account limited possibilities offered by local savings (very weak today in the area), and controlling for various types of foreign capital inflows in such a way that the balance must come from new bank credits.

1. Investment Needs Analysis

To address investment needs estimation issue in the WB, we present first of all the theoretical bases of the selected macroeconomic approach, which stresses the role of investment for economic growth [§1]. We look at a traditional analytical tool, based on the classical relation between the capital stock and the output of a country (average and marginal capital coefficients (*COR* and *ICOR*)) in order to determine the rate of induced capital accumulation ($\Delta K/Y$) compatible with a desired GDP growth ($\Delta Y/Y$). Then, in a second step [§2], we examine the application of this methodology to the Western Balkans countries and estimate ICOR levels in the region. The values obtained are relatively low compared to other countries of the region and of the world. We argue that, especially in transition countries, one should make a difference between historically observed figures during a period marked by instability of the capital coefficients and desirable (normative) values of this coefficient sustaining economic and social development on a balanced growth path. We address this issue [§3] by making some assumptions on reasonable and empirically relevant levels of the capital coefficient and of some desirable growth rate for the countries of the region. This allows us to simulate desirable investment needs to achieve a true economic development of the area (i.e. allowing a substantial correction of the gap existing today between the performances of the WB and those of the EU countries).

§1.1. Capital coefficient and basic relation of capital accumulation according to "standard" growth theory.

Since the pioneering works of R. Harrod (1939) and E. Domar (1946), through the works of N.R. Kaldor (1954), R. Solow (1956), E. Phelps (1961) and, thirty years after, the birth of the endogenous growth theory [P. Romer (1986), R. Lucas (1988), R. Barro (1988), Bencivenga & Smith (1991)], until its most recent developments (theories of "pro-poor" growth and "inclusive" growth) and the "alternative" growth theories (Setterfield, 2010), productive investment has always been regarded as the essential engine of growth along with labor, which remains of course the principal factor of its implementation. Despite the

increasing sophistication of these successive analytical constructions, the capital coefficient remains the basic tool used by the majority of IFIs (the World Bank[1] and IMF, UNDP, EBRD and, occasionally, also the EIB[2]) to examine the relation between growth and investment. Indeed the *COR* derives from the simplest possible assumption concerning this relation, which is that of a linearity, or proportionality, between the two variables, as indicated by the two expressions below (1) that refer respectively to the average coefficient (Capital-Output Ratio) and the "marginal" one (Incremental Capital-Output Ratio).

$$COR = \frac{K}{Y}, \quad ICOR = \frac{\Delta K}{\Delta Y} \qquad (1)$$

where *K* is the stock of physical capital, *Y* is the national income and ΔK is net investment.
Net investment is defined as gross investment (*I*) minus capital depreciation.

Of course "the endogenous growth models stress a multitude of inputs besides physical capital, such as human capital, intermediate 'new goods', organizational capital, etc.", but these models have more limited practical applications, as, to be estimated, they usually require the availability of large data bases over a long period of time (at least about thirty years), which, for the WB countries, do not exist. ***The capital coefficient*** can thus give some useful insights to analyze global investment needs in the WB as it describes the transmission channel between the rate of capital accumulation and growth, according to the basic model of the standard theory of growth. Conceptually, the *COR* and the *ICOR* summarize very different realities according to the period or geographical region to which they are applied, but from an empirical point of view, since the set of "stylized facts" stated by Kaldor and retained further in many applied studies [cf. for example, Graziani (1961), Allais (1962), Nehru & Dhareswar (1993) and Madsen *et al* (2012)], the value of *COR* seems to be a "structural invariant", in the medium term, in many countries. Yet if the *COR* is constant, then the *ICOR* is also constant as both coefficients are equal (which support the view of growth theory, old and new, that the steady state growth path, is an empirically relevant approximation)[3]. So, following the World Bank, *ICOR* is "... a useful tool for growth and investment scenarios comparing across countries"[4].

The basic relationship linking the rate of accumulation of productive capital (*ΔK/Y*), to the *ICOR* (or *COR*) and the regular (stable) growth rate of the economy (*ΔY/Y*) is as follows:

$$\frac{\Delta K}{Y} = \kappa \frac{\Delta Y}{Y} \qquad (2)$$

where κ is COR or ICOR. We can justify this relationship in two (slightly) different ways:

(i) $\frac{\Delta K}{Y} = \frac{\Delta K}{K}\frac{K}{Y}$

and, alongside of a " growth equilibrium steady state path", $\frac{\Delta K}{K}$ is equal to the GNP growth rate,

[1] In spite of some criticisms, even inside the World Bank, cf. Easterly (1999)
[2] cf. the document "Review of the Western Balkans Investment Framework (WBIF)», Annex 4: Pipeline, prepared by EIB, EBRD, CEB, KfW, the EU Commission and a group of some 20 bilateral donors active in the WBIF.
[3] Idea agreed by Easterly (1999), op.cit., when he writes "the ICOR is constant in the steady state of the endogenous growth model, as in the Solow model".
[4] See, for instance, among many World Bank studies, World Bank, 1996b, *Zambia: Prospects for Sustainable Growth 1995-2005* (The World Bank: Washington DC)".

$\frac{\Delta K}{K} = \frac{\Delta Y}{Y}$, etc. ... Then:

$$\frac{\Delta K}{Y} = \frac{\Delta Y}{Y}\frac{K}{Y} = COR\,\frac{\Delta Y}{Y} \qquad (3)$$

(ii) $\frac{\Delta K}{Y} = \frac{\Delta K}{\Delta Y}\frac{\Delta Y}{Y}$; where: $\frac{\Delta K}{\Delta Y} = ICOR$, then:

$$\frac{\Delta K}{I} = ICOR\,\frac{\Delta Y}{Y} \qquad (4)$$

Expressions (3) and (4) are equivalent and all variables are constant on a "steady state" equilibrium growth path, sometimes called also "proportional" or "uniform" growth path. Relation (4) indicates that, on this steady state, a reliable *ICOR* measure is needed to estimate the amount of investment needs (*ΔK*) necessary to achieve the desirable growth rate (*ΔY/Y*).

Many studies of applied economics were dedicated, during decades, to the measurement of the COR or of *ICOR*, and nowadays several databases provide estimates for the *ICOR*[1]. It is useful to notice that the order of magnitude of the *COR* (and the *ICOR*) usually appears to be higher in the developing countries than in the developed ones, as the latter are supposed to make a best use of their productive capital[2]. The most commonly admitted values for the coefficients are those of 4, for the developing countries, and of 3 for the industrialized ones.

§1.2. ICOR estimation for the WB

Physical capital stock and *COR/ICOR* estimation is a tricky exercise for a region as the Western Balkans for which only very short data series are available. To our knowledge only few attempts to estimate *ICOR* for the WB region were realized. Antiochou (2011) calculates *ICOR* measures using mean real growth rates observed in five WB countries (Croatia, Albania, Bosnia and Herzegovina, FYROM and Serbia) during the period from 1998 to 2009 and net fixed capital investment series (defined as the difference between gross fixed capital formation and consumption of fixed capital). Gabrisch (2014) compares average *ICOR* measures for the period 2002-2013 in the WB6 and Croatia with five New Member States (NMS5: Czech Republic, Hungary, Poland, Slovak Republic and Slovenia). Despite some disparities in estimations, certainly due to different data sources and time periods, both studies find surprisingly low *ICOR* values in the WB region, especially in some countries (negative value for Macedonia in Gabrish (2014) and very small value 0.7 in Serbia [Antiochou (2011)]). Gabrish (2014) finds that the *ICOR*s in the WB tend to be significantly lower than in NMS5.

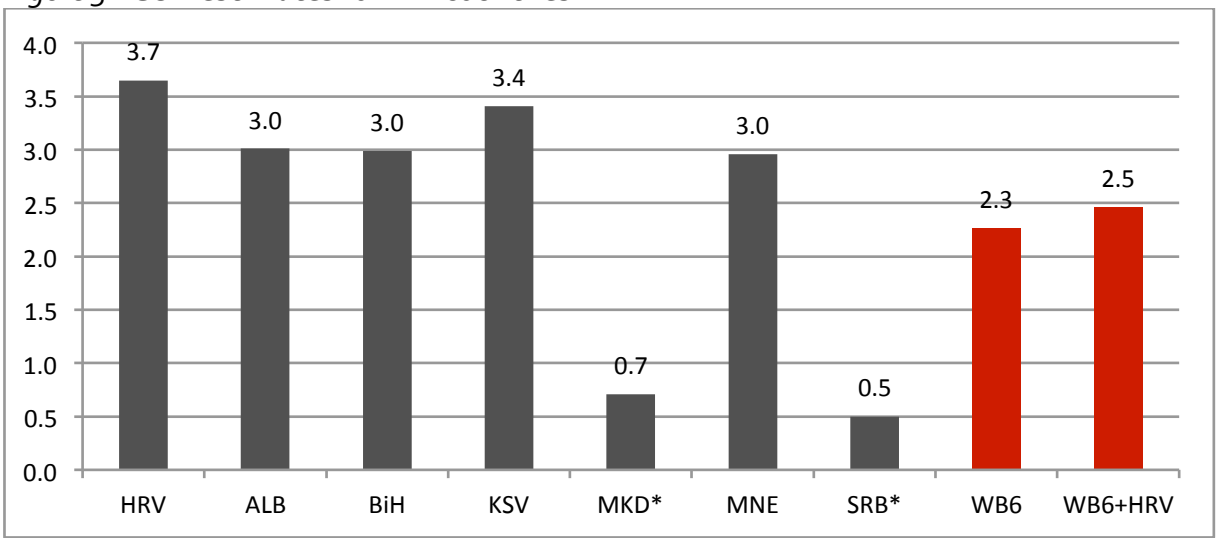
Our own estimation presents similar results (*Figure 3*). The 2001-2012 period was used as the reference period to calculate mean growth rates and average net-investment and a 1-year lag was used as it is suggested by literature. Some comments should be made on these figures. In fact, as the theory suggests,

[1] cf. for instance the USAID Country Compass (2012), or ECFIN's AMECO database, which gives the inverse of the ICOR ratio, which is called the marginal efficiency of investment (MEI).

[2] Incidentally this also means that the return on capital is lower in underdeveloped areas despite the fact that capital is scarcer. Indeed, the inverse of the *COR* is also the social rate of return of investment in a single good economy on its steady state, see for instance Graziani (1965, p.77) and the ample translation of this book in French in the 1967 article by the same author, pp. 169-170. Therefore capital movements will hardly be ever equilibrating, as they will normally go from underdeveloped to developed areas seeking higher returns, at least under constant exchange rates.

ICOR and *COR* are equal, which would imply that in Serbia and Macedonia one unit of output is produced with less than one unit of physical capital and thus that the stock of capital is very efficiently used. This is rather unusual when we know that in most developed countries the capital coefficient varies between 2.5 and 4 (in EU-15, it is estimated to be 3.1 in 2012)[1] and in developing and emerging economies it is much higher (for example, in fast growing Vietnam it attained 6.6 in 2007). Consequently, the investment needs based on such *ICOR* measure risk to be underestimated. This is all the more true that in the case of the WB investment efforts should be done not only in terms of new investment but also in terms of maintenance and replacement of obsolete capital inherited from the socialist era.

Figure 3. **ICOR estimates for WB countries**



(*) No specific adjustment was attempted for this atypical case, contrary to Antiochou (2011)
Source: own calculations based on data from the WDI database (World Bank)

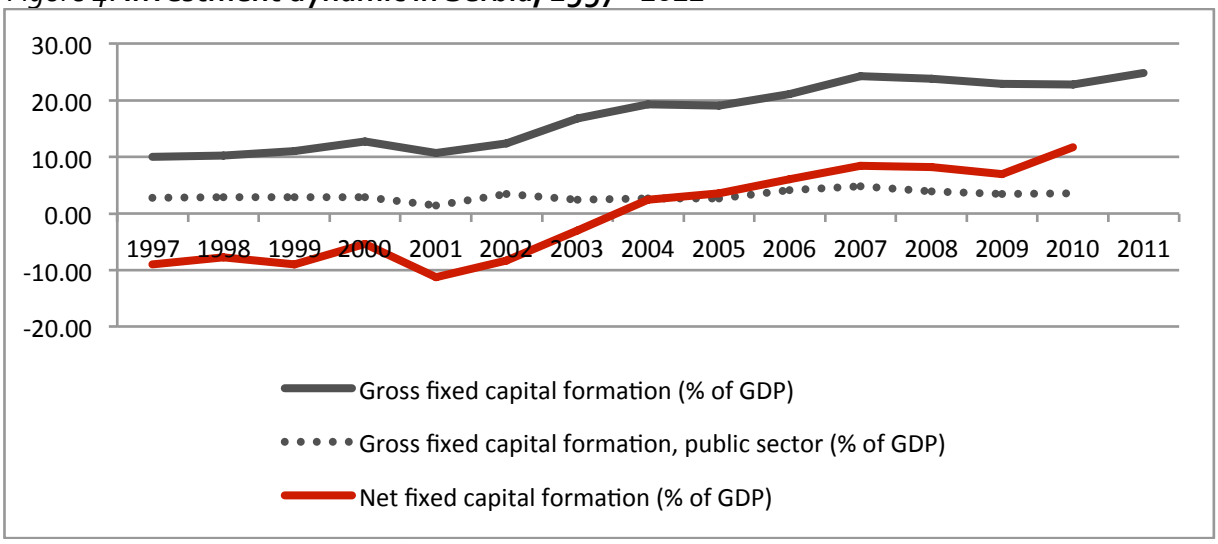
These very low observed values of the capital coefficient in some countries of the region are due to extraordinary high levels of capital consumption reported by the WDI database, which include the accelerated scrapping of old productive capacity installed in socialist times and damaged by the war. The fixed capital consumption data for Serbia and Macedonia and other WB countries should thus be used with prudence. *Figure 4* illustrates this very particular situation in Serbia where till 2004 gross investment was not sufficient to cover the "imputed" consumption of fixed capital due to the deterioration of the existing capital stock and therefore net capital formation was negative.

While admitting the possibility of accelerated obsolescence of capital due to destructions in some of the WB during the war, we think that it is not reasonable to project future investment needs based on the *ICOR* figures calculated from historical investment data. One can make an assumption that most of the capital deterioration was accounted during 1990s and 2000s and that progressively capital consumption rates and capital-output ratios will converge to those observed in other emerging countries. Rebuilding capital stock, both public and private, will need much effort in the medium run. That is the reason why it could be more sensible to project gross fixed capital formation in the region based on "normative" (or theoretically predicted) values of *ICOR* than on those historically observed during the past decade.

[1] AMECO database

This argument is supported by recent physical capital stock estimates data provided by Penn World Tables 8.0 [Feenstra et al. (2013)]. According to these estimates, it appears that physical capital stock per capita in the WB6 is less than 30% of the average EU15 level (in 2011, 28 800 $PPS_{\$}$ in WB6 versus 109 380 $PPS_{\$}$ in EU15).

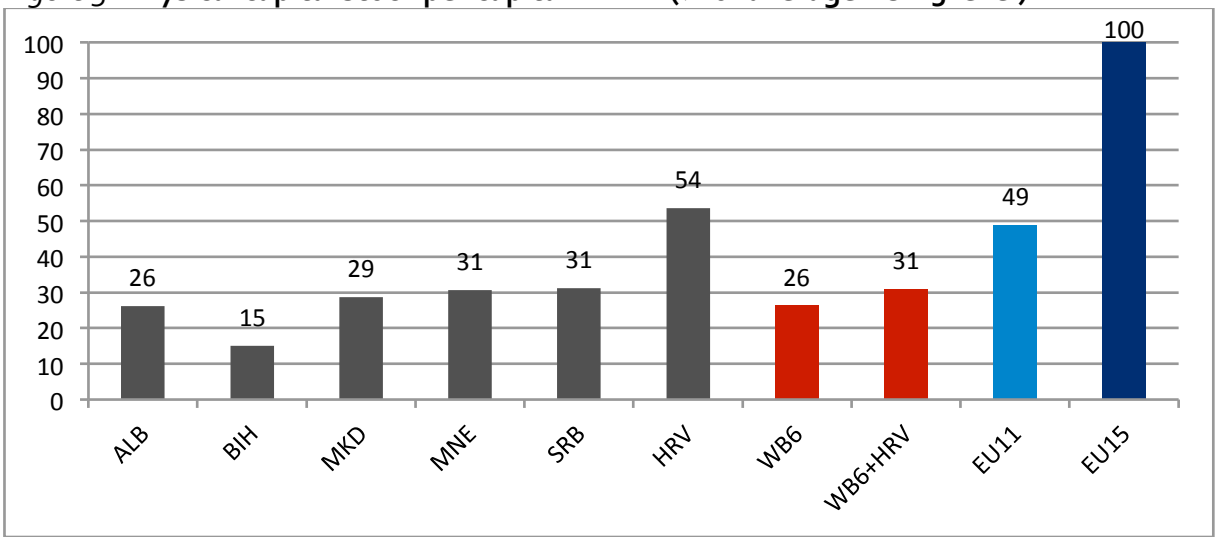
Figure 4: **Investment dynamic in Serbia, 1997 - 2011**



Source: own calculations based on data from the WDI database (World Bank)

It means that the existing capital stock might be not high enough to employ the entire labor force (unemployment level is dramatically high in the region). This leaves plenty of room for investment in the region to catch up productive capacities level of the developed countries of the EU.

Figure 5: **Physical capital stock per capita in 2011 (% of average EU-15 level)**



Source: calculations based on Penn World Tables 8.0 [Feenstra et al. (2013)]

§1.3. Theoretical projection of investment needs in the WB: a simplified simulation

We thus ask the question: "what amounts of gross investment, both private and public, should be undertaken in the region if one has an ambition to put the WB countries into a path of growth and development bringing to real convergence to the European Union?". The world economic crisis broke relatively high growth rates observed in the post-Balkan war period in the region and generated a

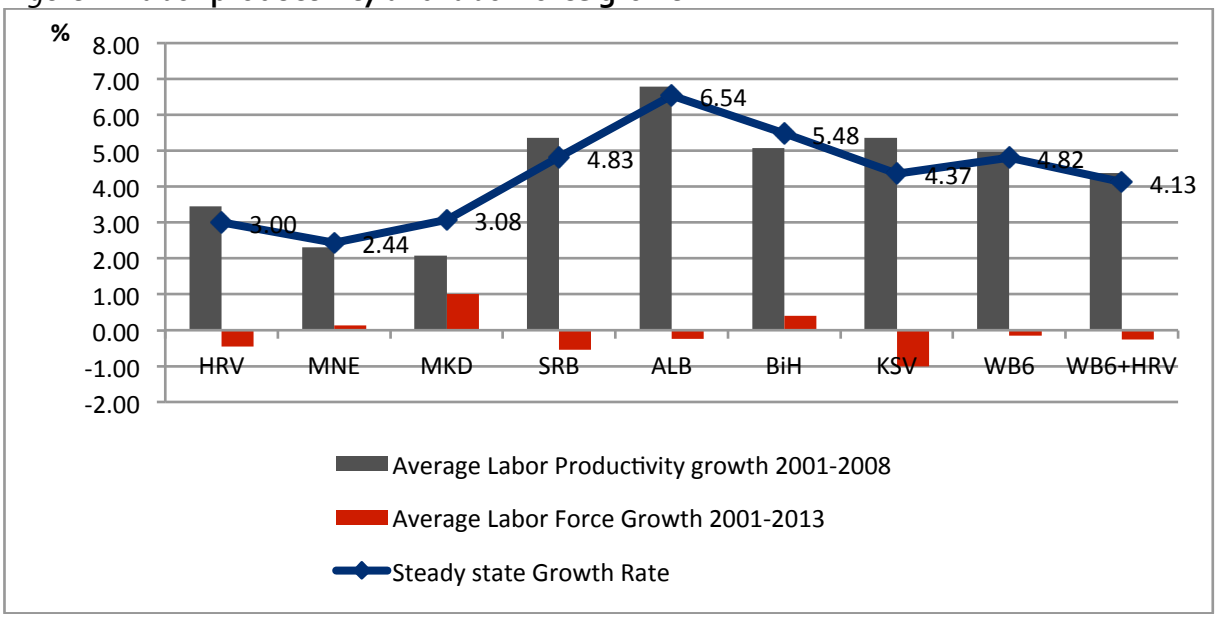
"double-deep recession"[1]. If we suppose that the countries of the region for their further development should recover, at least, their pre-crisis mean growth rates and assuming the normative ICOR of 4, we can proceed to the simulations of gross investment needs in the region for the medium-term perspective.

Different growth scenarios have been considered but here the presentation is limited to our central growth scenario ("steady", see figures 6 and 7). The simulation is based on the standard growth theory assuming that a country's (constant) steady state growth rate in the long run (say ***g***) is determined by the sum of the growth rate of its labor force (economically active population, say ***n***) and the growth rate of labor productivity (say ***p***).

$$g = n + p \qquad (5)$$

Recently, most of the WB countries are characterized by very low, and even negative, rates of active population growth. That means that the main source of growth comes from the labor productivity growth, which, in fact, was high during the past decade, previous to the crisis (cf. *Figure 6*). Thus, we calculate "theoretical" steady state growth rates based on mean labor force growth rates over the last years and mean labor productivity growth rates observed over the pre-crisis period (2001-2008).

Figure 6: **Labor productivity and labor force growth**



Source: calculations based on ILO KLM 2 data

An important empirical question to be addressed for this estimation is the one of the depreciation rate. We suggest taking normative values of the depreciation rate rather than historically observed ones, because high depreciation rates observed for the past should decrease in the near future. Thus, for our first simulations, we take a value of 10% of GDP, which is still a high depreciation level (it appears to be the mean during the past decade for Albania, BiH and Montenegro).

The projections (*Table 1*) show that, in the case of still high levels of capital stock depreciation, average annual gross investment needs for the WB region (with Croatia) would be of *EUR 45 billion* (*EUR 32 billion* if Croatia is excluded) in the central or "steady" scenario. We retain these figures as a desirable "average"

[1] Cf. World Bank (2012), South East Europe Regular Economic Report, No.3, December 2012.

value to achieve fast growth in the area. Obviously, these amounts would be more modest if high depreciation rates decrease consequently in the following years to 5% of GDP, *EUR 37 bn* and EUR *27 bn* respectively.

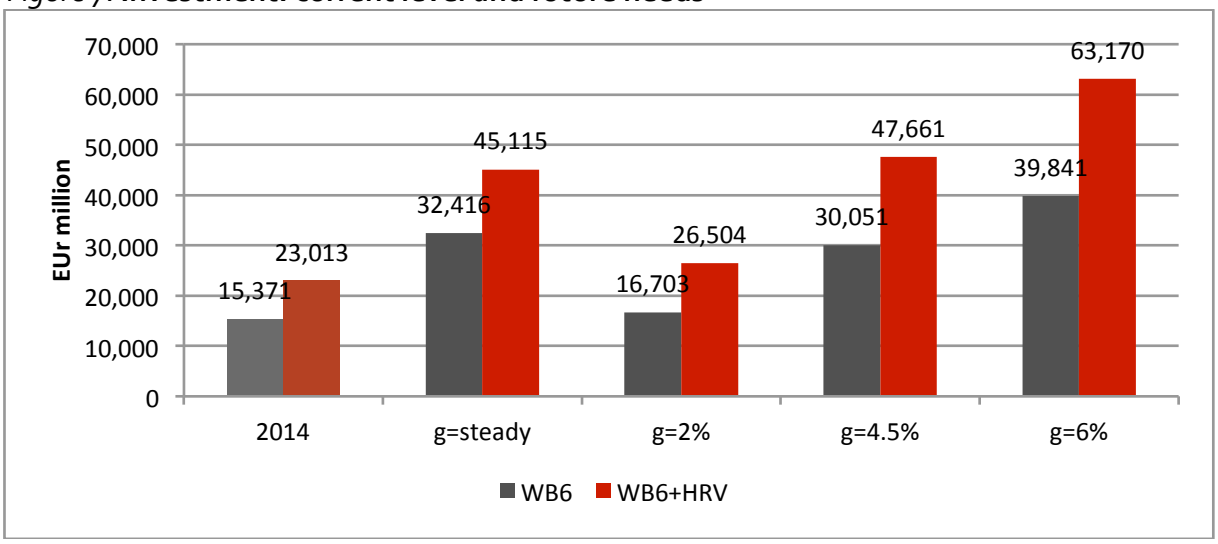
Table 1: **Investment needs projection for the "steady state" scenario (EUR m)**

	HRV	MNE	MKD	SRB	ALB	BiH	KSV	WB6	WB7
2015	10 007	698	1 872	9 831	3 452	4 655	1 613	**22 121**	**32 127**
2016	10 443	725	1 962	10 759	3 774	4 998	1 714	**23 933**	**34 376**
2017	10 928	753	2 069	11 730	4 141	5 378	1 817	**25 889**	**36 817**
2018	11 538	783	2 182	12 788	4 545	5 791	1 933	**28 023**	**39 560**
2019	12 181	813	2 301	13 942	4 987	6 237	2 053	**30 334**	**42 515**
2020	12 861	845	2 427	15 200	5 473	6 717	2 181	**32 843**	**45 703**
2021	13 578	878	2 559	16 572	6 006	7 234	2 316	**35 565**	**49 143**
2022	14 336	912	2 699	18 067	6 591	7 791	2 460	**38 519**	**52 855**
2023	15 135	948	2 846	19 697	7 233	8 390	2 613	**41 727**	**56 862**
2024	15 980	985	3 001	21 474	7 937	9 036	2 775	**45 208**	**61 188**
10 year-average	**12 699**	**834**	**2 392**	**15 006**	**5 414**	**6 623**	**2 148**	**32 416**	**45 115**

Source: own calculations based on Eurostat, DG ECFIN and WDI data

It is clear that comparing to the current investment level in the region, these estimations imply that the investment effort should be doubled (*Figure 7*). As a comparison, in 2014 gross fixed capital formation (forecast) did not much exceed the modest level of *EUR 23 bn* (WB7, given by the sum of WB6 and Croatia).

Figure 7: **Investment: current level and future needs**



Source: own calculations based on Eurostat, DG ECFIN and WDI data

Note: "g=steady" corresponds to our scenario based on "steady state" growth; alternative scenarios "g=2%", "g= 4.5%" and "g=6%" growth rate assume uniform growth rate (respectively, 2%, 4.5% and 6%) in all WB6 countries and Croatia in the following 10 years.

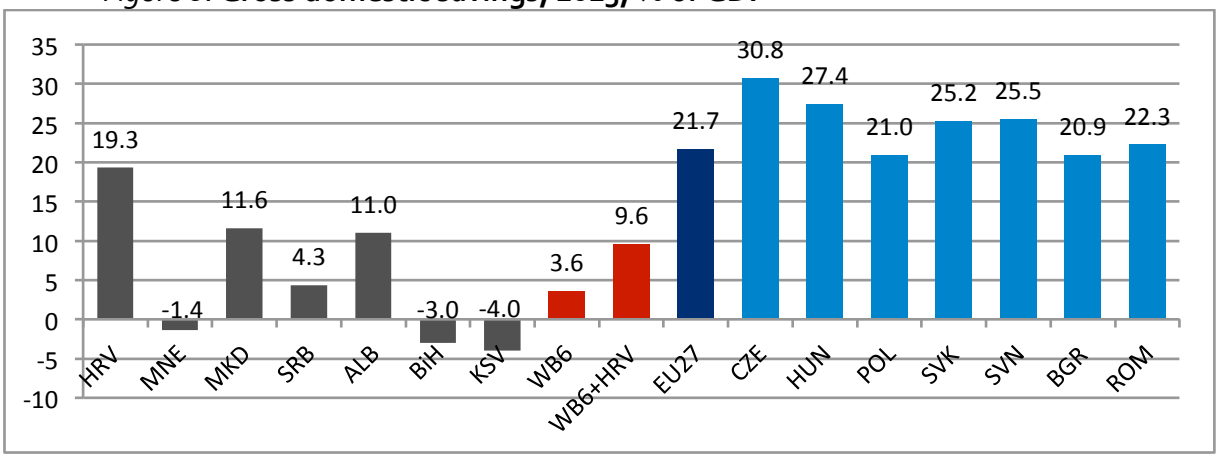
Our voluntarist scenario is thus unlikely to be realized in the short term, but it is relevant as a medium-term target. In fact, the current investment level implies modest economic growth, not exceeding 2% per annum. In our scenario average growth is 4%. If the WB aspire to a faster convergence to the EU living standards an even more ambitious investment program should be considered.

2. Analysis of investment stimulus impact on debt levels

The next logical step in this forward-looking and voluntarist exercise is the evaluation of the possible consequences of the increased investment in terms of debt and particularly public debt. During the crisis, debt accumulation and particularly public debt became a growing concern for all the countries of the region, though in different degrees. No doubt supporting increasing investment will signify also increasing debt. But to what extent? This question is the central issue of this section.

Given a low level of domestic saving in the WB6 comparing to European peers (*Figure 8*) and underdeveloped banking systems carrying the burden of non-performing loans, it is logical to expect that a large part of the increasing debt would be covered by external sources and the support of the international financial institutions is and would be essential in the following years.

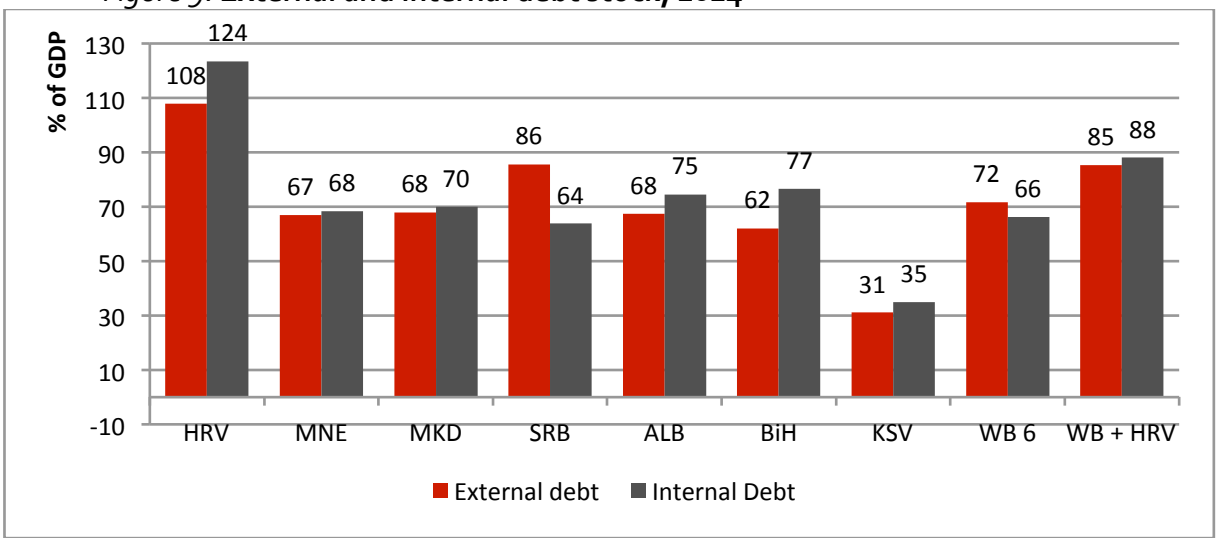
Figure 8: **Gross domestic savings, 2013, % of GDP**



Source: WDI
Note: WB6 and WB6+HRV are GDP weighted averages

As shown by *Figure 9*, almost half of the current debt stock comes from external financial sources (the latter are more important than domestic in Montenegro).

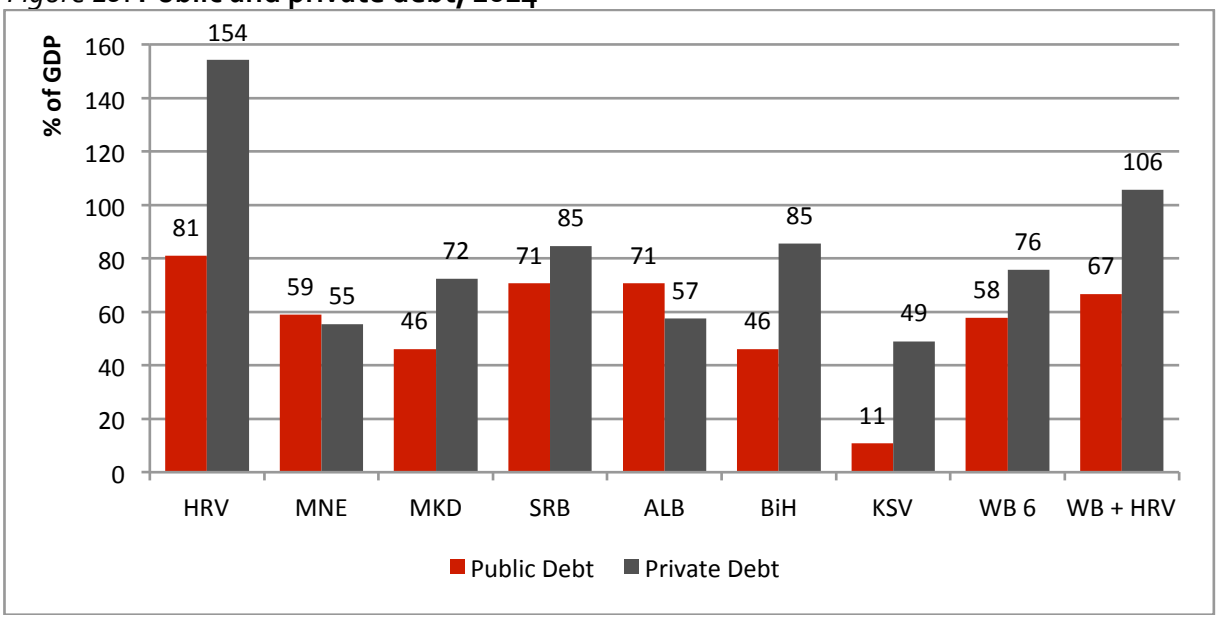
Figure 9: **External and internal debt stock, 2014**



Sources: calculations based on Eurostat, WDI (World Bank), wiiw Annual database, JEDH (BIS, IMF, World Bank).
Note: WB6 and WB6+HRV are GDP weighted averages; 2013 data is used where 2014 forecast was unavailable

In this beginning of 2015, the gross public debt stock of the three countries of the region exceed the highly symbolic level of 60% of GDP: in Serbia and Albania it attained 71% of GDP while in Croatia provisional data states 81% of GDP (*Figure 10*).

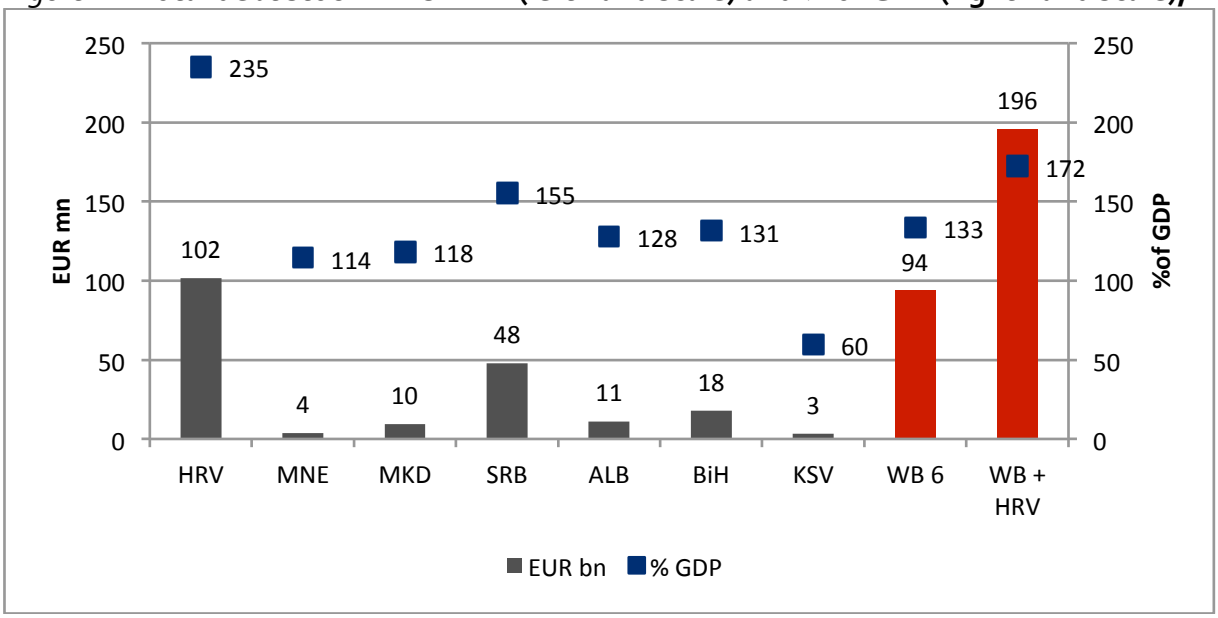
Figure 10: **Public and private debt, 2014**



Sources: calculations based on Eurostat, WDI (World Bank), wiiw Annual database, JEDH (BIS, IMF, World Bank).
Note: WB6 and WB6+HRV are GDP weighted averages; 2013 data is used where 2014 forecast was unavailable

The total debt stock, both private and public, of the WB6 region attained some *94 EUR bn* in 2014 what almost equals the debt stock of Croatia (*102 EUR bn*) bringing the total to *196 EUR bn* for the whole region (WB6+Croatia) (*Figure 11*).

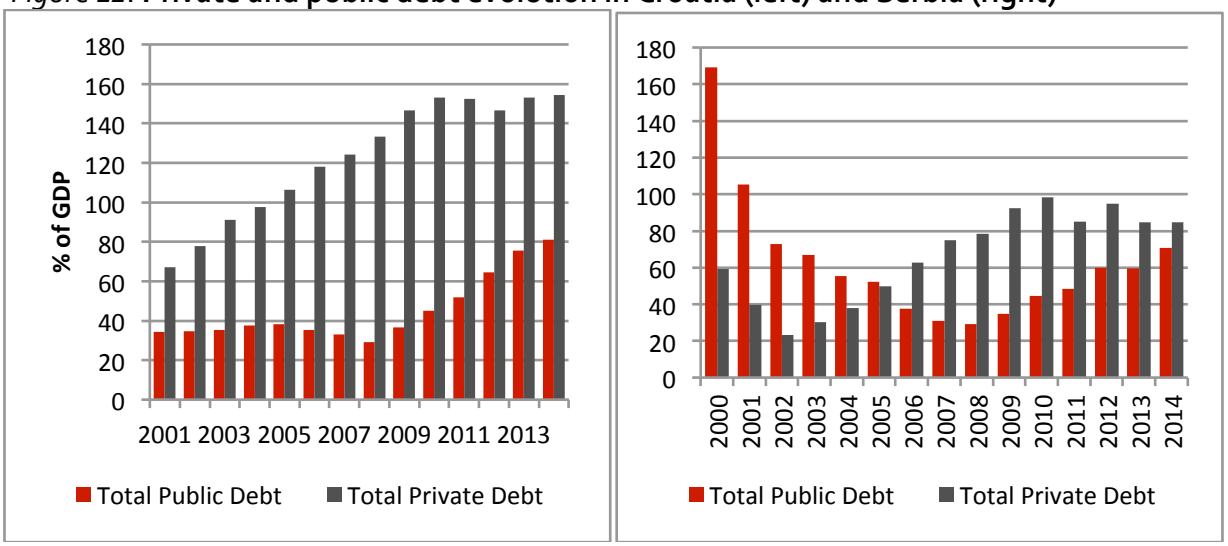
Figure 11: **Total debt stock in EUR mn (left hand scale) and % of GDP (right hand scale), 2014**



Sources: calculations based on Eurostat, WDI (World Bank), wiiw Annual database, JEDH (BIS, IMF, World Bank).

However it is important to note that despite the substantial increase in public debt during the crisis, a large portion of the current total debt stock[1] is explained by the acceleration of the private sector debt before the crisis, as shown by the examples of Serbia and Croatia (*Figure 12*).

Figure 12: **Private and public debt evolution in Croatia (left) and Serbia (right)**



Sources: calculations based on Eurostat, WDI (World Bank), wiiw Annual database, JEDH (BIS, IMF, World Bank).

In what follows we attempt to model the impact of investment increase proposed in the first section on the debt stock. To do this it is essential to coordinate real aggregates with financial flows in a consistent framework. Standard macroeconomic theories by accepting since Patinkin (1956) the implicit hypothesis of a financial market in equilibrium, fail to address the financial side of the economy. Recently post-Keynesians critical of neoclassical synthesis developed stock-flow consistent modeling[2], a rich and useful analytical tool linking together the real and financial sides of the economy. These models enable the analysis of the dynamic evolution of a country in the short and the medium term in a neostructuralist perspective. This theoretical framework responds perfectly well to our objective. Unfortunately, facing a major problem of reliable data availability for the Western Balkans[3], we are limited in our modeling possibilities and are forced to consider a simple model rather than a "state-of-art" and more sophisticated one. The model is briefly presented in the next paragraph before passing to the empirical simulation.

§2.1. Simple modeling of investment-financing relationship for the Western Balkans

i) Stock/Flow consistent models: the framework

Stock-flow consistent models treat an economy as a set of institutional sectors interacting with each another. The choice of the sectors is important and dictated by the object of the study. For open economies, it is usual to retain the sectors of households; the production firms; the banking sector (the Central bank can be considered separately); government and the rest of the world. Limited by data concern and taking into account our primal objective, for the purpose of this study we merged the households and the firms sectors[4] and thus retained four economic sectors: Private sector (noted *p*),

[1] Total debt stock estimates slightly vary depending on if they were calculated as a sum of external and internal debt or as a sum of public and private debt. These discrepancies are due to the fact that no centralized data is available for this region and different proxies from numerous sources were used.

[2] On the genesis and the interest of stock-flow consistent modeling, cf. Godley and Lavoie(2007)

[3] Detailed financial balance sheet data for the Western Balkans is not available

[4] Combining households and firms in the private sector was used for example by Papadimitriou et al (2013).

Public Sector (General government, noted *g*), Banking sector (noted *b*) and the Rest of the World (noted *w*), as the Western Balkans represent small open economies largely interacting with foreign trade partners and particularly with the EU countries, in both the real and in the financial spheres.

Real and financial interactions between these four sectors are recorded in the transaction flows matrix in a simplified form (*Table 3*). In this matrix positive values stand for sources (or receipts) in terms of national accounts and negative values present uses (or expenditure). Likewise, on the financial side, positive values indicate an incoming flow of money and negative values - outgoing flow of money (or acquisition of financial asset). In this accounting framework, a source for one sector is necessarily a use for another, according to the principle of quadruple entry retained in national accounts. Thus all lines in the transaction matrix must balance to zero and each sector's budget constraint appears as the sum of the columns of the matrix. In this simplified framework, we assume that banks and the rest of the world grant loans to private and public sector (via treasury bills purchasing). We make also an implicit assumption that the private sector (households and firms) does not purchase government bills. It is a simplifying assumption which is rather close to the Western Balkans reality: the large majority (around 70%) of government debt instruments is held by banking sector. Contrary to a common practice, we make an assumption that physical capital accumulation occurs not only in the private sector but also in the public sector through public investment in infrastructure. We thus make a distinction between government consumption expenditure and fixed capital investment. The share of public capital investment in total investment varies from 10% in Croatia to 40% in Kosovo, the average ratio for the whole region being a split or total investment between 25% of public investment and 75% of private investment.

ii) The model

Table 2 defines the set of variables and structural parameters as used in the relations describing interactions between the sectors.

Table 2. **Definition of the variables of the model**

Endogeneous variables		Exogenous variables		Parameters
Target	Other	Decision variables	Other	
L_g^b Public sector debt vis-à-vis banking sector	Y National income	I_p Gross private sector investment	Y_{t-1}	c_p private sector propensity to consume disposable income
L_g^w Public sector debt vis-à-vis the Rest of the World	X Exports	I_g Gross private sector investment	X_{t-1}	c_g public sector propensity to consume disposable income
L_p^b Private sector debt vis-à-vis banking sector	M Imports	ΔK Net investment	M_{t-1}	k ICOR
L_p^w Private sector debt vis-à-vis the Rest of the World	C_p Private final consumption	FCC Fixed capital consumption	$L_{g,t-1}^b$	t tax rate
	C_g Public final consumption		$L_{g,t-1}^w$	α private inv. in % of total inv.
	T taxes		$L_{p,t-1}^b$	v inverse of velocity of money
	ΔM Change in cash balances		$L_{p,t-1}^w$	m propensity to import
	R Reserves (in local currency)		Φ_{t-1}^w	δ Fixed capital depreciation
			Φ^w Non-debt Financial foreign flows	

Table 3. **Simplified transactions flow matrix**

	Private sector	**Public sector**	**Banking sector**	**Foreign sector (World)**	**Σ**
Supply (domestic and foreign)	**+ Y**			**+ M**	**Y+M**
Demand (domestic and foreign)	**$-C_p - I_p$**	**$-C_g - I_g$**		**– X**	**– C – I – X**
Consumption	$-C_p$	$-C_g$			$-C = -(C_p + C_g)$
Investment	$-I_p$	$-I_g$			$-I = -(I_g + I_p)$
Exports				– X	– X
Taxes	**– T**	**+ T**			0
Financing Capacity or Need	**$Y - C_p - I_p - T$**	**$-C_g - I_g + T$**		**M – X**	**Y+M– C – I – X= *o***
Change in Reserves			**– ΔR**	**+ ΔR**	0
Change in Cash and Deposits	**$-\Delta M^d$**		**$+\Delta M^s$**		0
Change in Debt creating Flows (Loans, Bills etc.)	**$+\Delta L_p^b + \Delta L_p^w$**	**$+\Delta L_g^b + \Delta L_g^w$**	**$-\Delta L_p^b - \Delta L_g^b$**	**$-\Delta L_p^w - \Delta L_g^w$**	0
Change in Non-Debt **foreign** flows (Remittances, FDI, shares, etc.)	**$+\Delta\Phi^w$**			**$-\Delta\Phi^w$**	0
Σ	**$-\Delta M^d + \Delta L_p^b + \Delta L_p^w + \Delta\Phi^w$**	**$\Delta L_g^b + \Delta L_g^w$**	**$-\Delta R + \Delta M^s - \Delta L_p^b - \Delta L_g^b$**	**$\Delta R - \Delta L_p^w - \Delta L_g^w - \Delta\Phi^w$**	**o**
Σ (CF/BF+changes in financial balances)	**o**	**o**	**o**	**o**	**o**

N.B : The notations are those commonly used in macroeconomic models and detailed in *Table 2*; we note however that R designs foreign exchange reserves in local currency, $\Delta\Phi^w$ stands for financial flows from/to the Rest of the World not affecting debt (mostly income and current transfers but also FDIs and shares); ΔL_j^i represent borrowing from one sector to another; thus, for example, ΔL_p^b, is the borrowing of the private sector (*p*) from the banking system (*b*) affecting the stock of the private debt L_p.

The transactions flow matrix (*Table 3*) puts in evidence the interactions between the four institutional sectors. The model corresponding to this matrix is described by the following relations:

Behavioral relations

$$T = tY \quad (1)$$
$$C_P = c_p(Y-T) = c_p(1-t)Y \quad (2)$$
$$C_g = c_g T \quad (3)$$

One can note that c_p in (2) is obtained as the ratio of private consumption to GDP from: $c_p = \frac{1}{1-t}\frac{C_p}{Y}$.

$$M = tY \quad (4)$$
$$\Delta M^d = v * \Delta Y \quad (5)$$

By definition the following identities hold:

Identities

$$I = I_p + I_g; \qquad \Delta K = \Delta K_p + \Delta K_g \quad (6)$$
$$I_p = \alpha * I; \quad (7)$$
$$I_g = (1-\alpha) * I; \quad (7')$$
$$I = \Delta K + FCC \quad (8)$$
$$\Delta L_g = \Delta L_g^b + \Delta L_g^w \quad (9)$$
$$\Delta L_p = \Delta L_p^b + \Delta L_p^w \quad (10)$$
$$L_{g,t} = L_{g,t-1} + \Delta L_g \quad (11)$$
$$L_{p,t} = L_{p,t-1} + \Delta L_p \quad (12)$$
$$Y_t = Y_{t-1} + \Delta Y \quad (13)$$

Growth dynamic equation

$$\Delta Y = k^{-1}\Delta K \quad (14)$$

Budget constraints at sectoral level

Private sector (p):

$$Y - T - C_p - I_p = \Delta M^d - \Delta L_p^b - \Delta L_p^w - \Delta\Phi^w \quad (15)$$

Public sector (g):

$$T - C_g - I_g = -\Delta L_g^b - \Delta L_g^w \quad (16)$$

Banking sector (b):

$$\Delta M^s = \Delta R + \Delta L_p^b + \Delta L_g^b \quad (17)$$

Foreign sector (w):

$$\Delta R = X - M + \Delta L_p^w + \Delta L_g^w + \Delta \Phi^w \quad (18)$$

Money market equilibrium condition:

$$\Delta M^s = \Delta M^d \quad (19)$$

National income accounting identity:

$$Y + M = C_p + C_g + I_p + I_g + X \quad (20)$$

iii) Solution of the model

The model is solved for the change in total, private and public debt.

Public Debt

After some algebraic manipulations based on relations (16), (13), and (14), and assuming that public and private sector fixed capital depreciate at the same rate, the following dynamic expression is obtained for public debt (combining domestic and external debt):

$$\Delta L_g^b + \Delta L_g^w = \left[(c_g - 1)t\right]Y_{t-1} + \left[1 - \alpha + (c_g - 1)tk^{-1}\right]\Delta K + (1-\alpha)FCC \quad (21)$$

This expression can be simplified defining: $\mu = (c_g - 1)t$ and $\lambda = 1 - \alpha + (c_g - 1)tk^{-1}$, which gives:

$$\Delta L_g^b + \Delta L_g^w = \mu Y_{t-1} + \lambda \Delta K + (1-\alpha)FCC \quad (21')$$

where, being combinations of the structural parameters of the model, λ and μ can be assumed to be constant in the short and medium term.

Private debt

Likewise, from the relation (15), we obtain the following dynamic expression of private debt:

$$\Delta L_p^b + \Delta L_p^w = \Delta M^s - \Delta \Phi^w + (c_p - 1)(1-t)Y_{t-1} + \left[\alpha + (c_p - 1)(1-t)k^{-1}\right]\Delta K + \alpha FCC \quad (22)$$

Again, by defining: $\chi = \Delta M^s - \Delta \Phi^w + (c_p - 1)(1-t)Y_{t-1}$ and: again $\theta = \alpha + (c_p - 1)(1-t)k^{-1}$, one can simplify (22):

$$\Delta L_p^b + \Delta L_p^w = \chi + \theta \Delta K + \alpha FCC \quad (22')$$

one should note that θ could be seen as constant in the medium and long-term, whereas for χ, constancy implies a "no policy change" assumption for ΔM^S and no change in FDI for ΔΦ.

Total debt

From (21') and (22'), total debt is:

$$\Delta L_p^b + \Delta L_p^w + \Delta L_g^b + \Delta L_g^w = \Delta M^d - \Delta \Phi^w - \left[1 - c_p + t(c_p - c_g)\right]Y_{t-1} + \left[1 - (1 - c_p + (c_p - c_g)t)k^{-1})\right]\Delta K + FCC \quad (23)$$

Let: $\Lambda = \Delta M^d - \Delta \Phi^w - \left[1 - c_p + t(c_p - c_g)\right]Y_{t-1}$ and : $\Psi = 1 - (1 - c_p + (c_p - c_g)t)k^{-1})$, then:

$$\Delta L_p^b + \Delta L_p^w + \Delta L_g^b + \Delta L_g^w = \Lambda + \Psi \Delta K + FCC \quad (23')$$

Expressions (21), (22) and (23) establish a clear relationship between debt variation and economic policy variables (targets and instrument), such as investment (in all three cases), monetary supply policy (22, 23), as well as between the debt variation and other exogenous variables, like non-debt financial inflows (22, 23). Moreover, in the expressions (21′), (22′) and (23′), λ, θ, and Ψ, appear as investment 'multipliers' of private and public debt.

§2.2. Empirical simulation of the debt variation generated by an investment stimulus in the Western Balkans

In a first step, structural parameters of the model were estimated. Then, in a second step, the calibrated model was subjected to the 'central' investment stimulus suggested by section 1 in order to determine financial needs corresponding to this scenario.

(i) Structural parameters estimation

The parameters of the model were estimated based on available macroeconomic data from different sources. Some assumptions were also made when imposed by data limitations or theoretical considerations. Consistently with the first section, we assume, for instance, that the *ICOR* equals 4.

Table 4. **Main WB indicators and structural parameters**

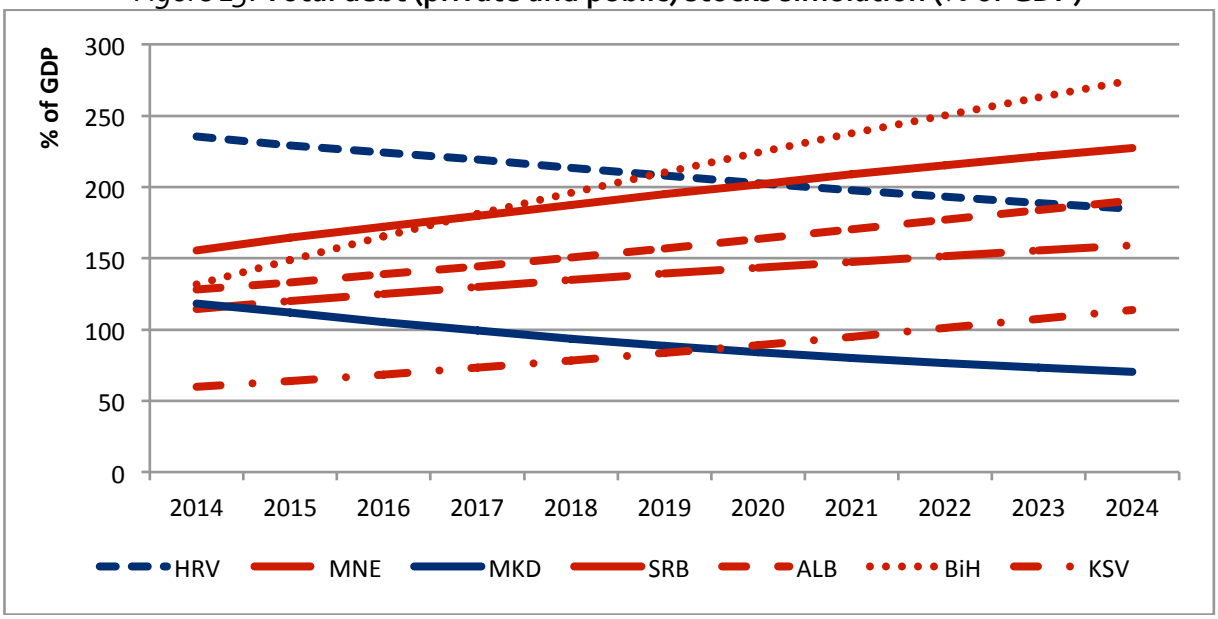
	HRV	MNE	MKD	SRB	ALB	BiH	KSV
Final consumption expenditure: household and NPISH (% of GDP)	61.5	79.3	74.9	77.9	80.7	86.0	88.9
Final consumption expenditure: General government (% of GDP)	19.4	24.2	18.5	19.6	10.5	21.6	19.3
Tax revenue (% of GDP)	19.8	25.2	22.0	22.7	22.0	20.9	22.3
Imports of goods and services (% of GDP)	45.5	71.2	67.7	52.9	52.1	56.4	52.1
Money supply: M2 (% of GDP)	67.4	53.6	42.7	38.5	77.1	51.9	38.7
GFCF of private sector/ GFCF total	87.8	73.7	67.2	83.4	77.4	71.2	66.2
t	0.198	0.252	0.220	0.227	0.220	0.209	0.223
c_p	0.766	1.061	0.960	1.008	1.034	1.087	1.144
c_g	0.980	0.959	0.842	0.863	0.479	1.030	0.864
v	0.674	0.536	0.427	0.385	0.771	0.519	0.387
m	0.455	0.712	0.677	0.529	0.521	0.564	0.521
k	4	4	4	4	4	4	4
α	0.878	0.737	0.672	0.834	0.774	0.712	0.662
Ψ	0.952	1.009	0.984	0.994	0.978	1.019	1.020
μ	-0.004	-0.010	-0.035	-0.031	-0.114	0.006	-0.030
λ	0.121	0.260	0.319	0.158	0.198	0.290	0.330

Some comments should be made on these indicators. As it was largely stressed in the literature, in the previous years growth in the WB was mainly sustained by high consumption. Such "growth model" was declared unsustainable by EU authorities and international financial institutions like World Bank [DG ECFIN (2010), World Bank (2014), different IMF country reports]. This is confirmed by our structural indicators: the propensity to consume disposable domestic income exceed 1 in Montenegro, Serbia, Albania and Bosnia and Herzegovina and Kosovo leaving no room for domestically financed investment. It is obvious that in this case, the so much needed investment can only be financed by increasing (external?) debt, at least in the beginning, till structural adjustment takes place.

(ii) Main simulation results

Our simulation results confirm this guess. The proposed "central" investment stimulus scenario (*EUR 32 bn* and *EUR 45 bn* in average per annum for WB6 and WB6+Croatia respectively) is consistent with *EUR 22 bn* and *EUR 25 bn* average total debt increase respectively. As we can see, the accumulation of debt is less than proportional to the investment effort due to the growth dynamics created by the investment multiplier-accelerator process. This debt accumulation dynamic is driven by the countries with structural "over-consumption" levels while the others (though highly indebted in the present, like Croatia) should see their relative to GDP debt level decreasing (*Figure 13*).

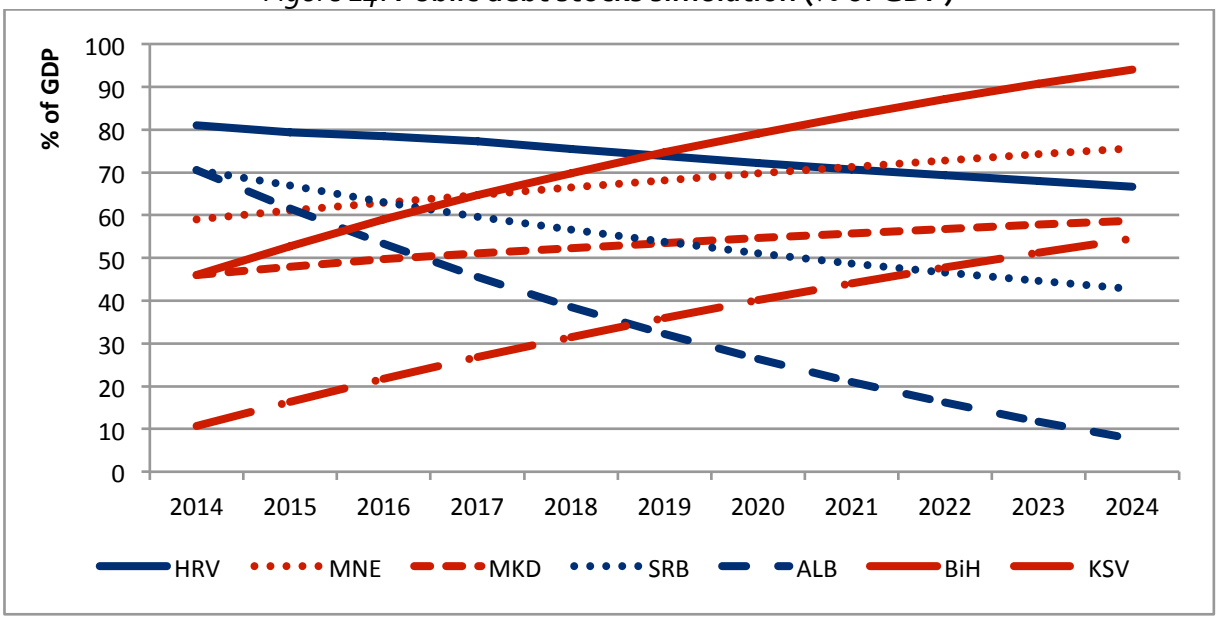
Figure 13: **Total debt (private and public) stocks simulation (% of GDP)**



Note: these projections imply constancy of the structural parameters; we also assume that non-debt financial flows dynamic is depending on the Rest of the World growth

It is noteworthy that the total debt accumulation is mostly due to the private sector debt increase while the change in public debt is relatively modest (*EUR 3.6 bn* and *EUR 4.9 bn* on average).

Figure 14: **Public debt stocks simulation (% of GDP)**



If the investment stimulus is sufficient, public debt increase is relatively modest due to the fact that growth is boosted , which increases fiscal revenues. This optimistic perspective is, for sure, depending on the capacity of governments to prioritize productive investments that would really generate growth. Depending on their particular structural parameters, countries are predicted to follow quite different patterns in terms of public debt as % of GDP. The extremely optimistic projection in Albania is explained by the currently very low government consumption expenditure, which will certainly rise with the progress of reforms and increasing living standards.

Conclusion

This paper aimed at estimating the future investment needs in the Western Balkan region from a positive and voluntarist perspective. Facing the major problem of data availability for the countries of the region, we opted for a standard tool largely applied in development economics. This study support the argument that to avoid the vicious circle of permanent underdevelopment, growing fiscal deficits and social tensions, the substantial investment effort should be undertaken in the medium term. This effort should be sufficient enough to trigger economic growth which would pay back the cost of the initial stimulus and put the countries on the development path.

A projection of such an effort on debt levels was then undertaken. The macroeconomic model developed here, though simplistic, showed that the proposed investment stimulus would indeed increase debt in nominal terms. However, this debt increase can be transformed into a decrease of debt level relative to GDP under certain conditions. Besides, it appears that private debt acceleration contributes to a much larger extent to total debt dynamic than public one.

References

Allais, Maurice. 1962. "The Influence of the capital-output ratio on the real national income", *Econometrica*, 1962, Vol. 30, Issue 4 (October), pp. 700 – 728.

Antiochou, Effie. 2011. "*Medium Term Projections of Investment in the Western Balkans",* EIB Working Paper, Sept 2011, 43 p.

Barro, Robert J. 1988. "Government Spending in a Simple Model of Endogenous Growth", RCER Working Papers from University of Rochester - Center for Economic Research (RCER)

Bartlett, Will, and Milica Uvalić. 2013. "Chapter 1. Introduction". [ed] Will Bartlett and Milica Uvalić. *The Social Consequences of the Global Economic Crisis in South East Europe*. London: London School of Economics and Political Science, June 2013, pp.1-14.

Bencivenga, Valerie R., and Bruce D. Smith. 1991. "Financial Intermediation and Endogenous Growth". *Review of Economic Studies.* 1991, Vol. 58, pp. 195-209

DG ECFIN. 2010. "The pre-accession economies in the global crisis: from exogenous to endogenous growth", Occasional Papers, No.62, June 2010.

Domar, Evsey D. 1946. "Capital Expansion, Rate of Growth, and Employment", *Econometrica,* Vol. 14, No. 2 (Apr., 1946), pp. 137-147

Easterly, William. 1999. "The Gost of Financing Gap. Testing the Growth Model Used in the International Financial Institutions", *Journal of Development Economics* 60 (2), pp. 423-438, (December 1999).

Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. 2013. "The Next Generation of the Penn World Table" available for download at www.ggdc.net/pwt.

Gabrisch, Hubert. 2014. "The binding constraint on growth in less developed Western Balkan countries", MPRA Paper No. 60020, http://mpra.ub.uni-muenchen.de/60020/, pp.1-25.

Godley, Wynne, and Marc Lavoie. 2007. *Monetary Economics: An Integrated Approach to Credit, Money, Income, Production and Wealth*, Palgrave MacMillan, New York

Graziani, Augusto. 1961. "Il Rapporto Capitale-Prodotto nell'Economia Italiana : Aspetti teorici e risultati statistici", *Giornale degli Economisti e Annali di Economia*, Nuova Serie, Anno 20, No. 3/4, (Marzo-Aprile 1961), pp. 211-244.

Graziani, Augusto. 1967. "La valeur actuelle de la théorie de l'équilibre économique général", *Economies et Sociétés - Cahiers de l'ISE*A, n. 16, pp. 119-176, special number of the series BA5: Cahiers franco-italiens n. 9 (Novembre); translation of large parts of Equilibrio generale ed equilibrio macroeconomico, Napoli: Edizioni Scientifiche Italiane, 1965.

Harrod, Roy F. 1939. "An Essay in Dynamic Theory", *The Economic Journal,*Vol. 49, No. 193 (Mar., 1939), pp. 14-33.

Kaldor, Nicholas. 1957. "A Model of Economic Growth", *Economic Journal*, Dec., 1957, pp. 591–624.

Lucas Jr., Robert E. 1988. "On The Mechanics of Economic Development", *Journal of Monetary Economics*, vol. 22, pp. 3-42.

Madsen, Jakob B., Vinod Mishra and Russell Smyth. 2012. "Is the Output Ratio Constant?", *The Manchester School*, Vol.80, pp. 210-236 (March 2012).

Nehru,Vikram, and Ashok Dhareshwar. 1993. "A New Data Base on Physical Stocks. Sources, Methodology and Results", *Revista de Analysis Economico*, Vol.8, N°1, pp. 37-59 (June 1993)).

Papadimitriou, Dimitri B., Gennaro Zezza, and Michalis Nikiforos. 2013. "A Levy Institute Model for Greece. Technical Paper", Levy Economics Institute of Bard College, May 2013.

Phelps, Edmund. 1961. "The Golden Rule of Accumulation: A Fable for Growthmen", *The American Economic Review*, Vol.51, N°4 (Sep. 1961), pp.638-643.

Phelps, Edmund. 1966. *Golden rules of economic growth*, New York, Norton

Romer, Paul M. 1986. "Increasing Returns and Long-Run Growth", *The Journal of Political Economy*, Vol. 94, No. 5. (Oct., 1986), pp. 1002-1037.

Setterfield, Marc. 2010. *Handbook of Alternative Theories of Economic Growth*, Cheltenham, Edward Elgar.

Solow, Robert M. 1956. "A Contribution to the Theory of Economic Growth", *The Quarterly Journal of* Economics, Vol. 70, No.1. (Feb.1956), pp. 65-94.

WBIF. 2010. *Review of the Western Balkans Investment Framework*, December 2010.

World Bank. 2012. "South East Europe Regular Economic Report No.3: From Double-Dip Recession to Accelerated Reforms", Word Bank, 2012, December 18.

World Bank. 2014a. "South East Europe Regular Economic Report No.6: Brittle Recovery", Word Bank, 2014, May 2014.

World Bank. 2014b. "South East Europe Regular Economic Report No.6 update: Uneven Recovery", Word Bank, 2014, December 2014.