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Productivity Growth and Structural Reform in Bulgaria: Restarting the Convergence Engine

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European Department

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Abstract

Labor productivity levels in Bulgaria lag well behind that in the EU, weighing on the convergence process. Stronger productivity growth would allow Bulgaria to close the income gap with the EU average more quickly and to alleviate the structural problems in its labor market, reflected in its high long-term and youth unemployment. Our analysis of the drivers of labor productivity suggest that for Bulgaria closing the gap with EU standards in the areas of institutional and infrastructure quality, goods market efficiency, higher education, and innovation would permanently boost productivity growth by a total of 1 percentage point a year. This would be enough to close the income gap with the EU average by 2040, compared to the status quo where it would take an additional 10 years.

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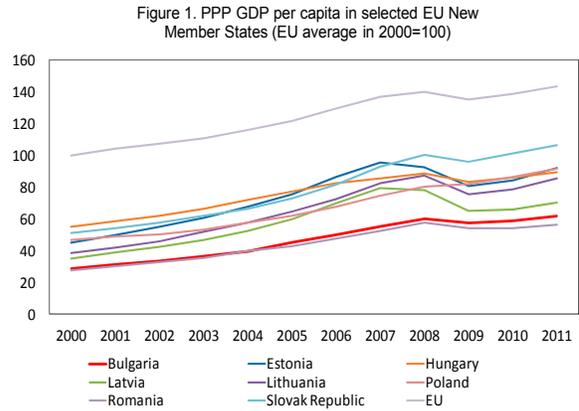
I. INTRODUCTION

1. **After years of high economic growth and job creation linked to the income catching-up process, the Bulgarian economy has entered difficult times.** On the heels of the 2008 global financial crisis, GDP and incomes in Bulgaria plunged in 2009 and the ensuing recession was accompanied by massive job losses that to a large extent erased the jobs gains seen during the boom. This ultimately resulted in a sharp rise in unemployment, especially amongst the young and lower skilled. As Bulgaria enters its fourth year since the 2008 shock, growth, incomes and jobs creation have yet to show any convincing signs of recovery. Assuming that GDP growth reaches 2 percent per year it would take more than 10 years to bring the unemployment rate back to its pre-crisis low of 5.6 percent.
2. **The key challenge facing Bulgaria is to restart the growth and convergence process to make headway into the sizeable job and income gap with the EU.** While the great global recession contributed to a slowdown in income growth in Bulgaria—income growth was roughly ten times as low as that registered in the boom causing the gap in income levels with the EU to widen in 2011—the shock bought to the fore long standing structural problems in the Bulgarian labor market. Owing to low levels of productivity, wage levels in Bulgaria rank amongst the lowest in Europe. Moreover even in times of high growth, the job content of growth was skewed towards low- skilled, low-valued service sectors. Meanwhile sectors with strong growth potential had difficulty finding qualified skilled workers to meet their needs. Looking ahead Bulgaria’s rapidly ageing population will make it essential that ways be found to boost labor productivity if high GDP growth that is critical to job creation and to Bulgaria’s income convergence is to be realized.
3. **The purpose of this paper is to analyze productivity and job developments in Bulgaria and to identify key factors and associated policies that can accelerate Bulgaria’s productivity, and ultimately income growth.** Section II presents background information on productivity and employment developments in Bulgaria over the last decade. Estimates of gains to labor productivity from key structural aspects of the economy are elaborated in Section III and associated structural reforms suggested in Section IV. Section V concludes.

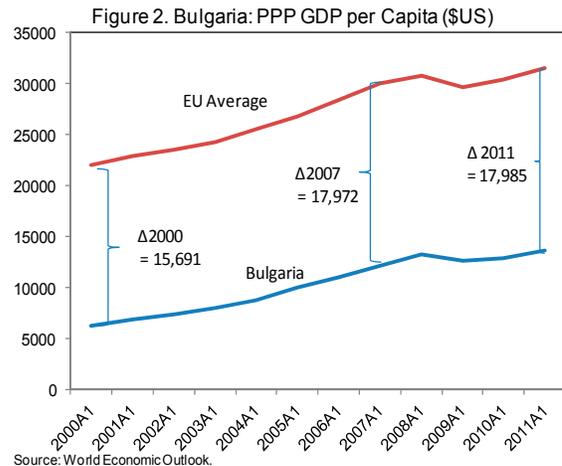
II. STYLIZED FACTS ON THE BULGARIAN LABOR MARKET

A. Slow Convergence-Low Productivity Nexus

4. **Bulgaria did not catch up its emerging Europe peers during the last decade in terms of income per capita.** A cross country comparison between EU New Member States (NMS) shows that, albeit being the second poorest country in 2000, Bulgaria did not experience a faster growth than its peers in its PPP GDP per capita in the following decade, sharing a similar picture with Romania (Figure 1). Therefore, the gap with its regional peers remained the same or widened even with countries that faced a very severe recession from 2007, such as Latvia.

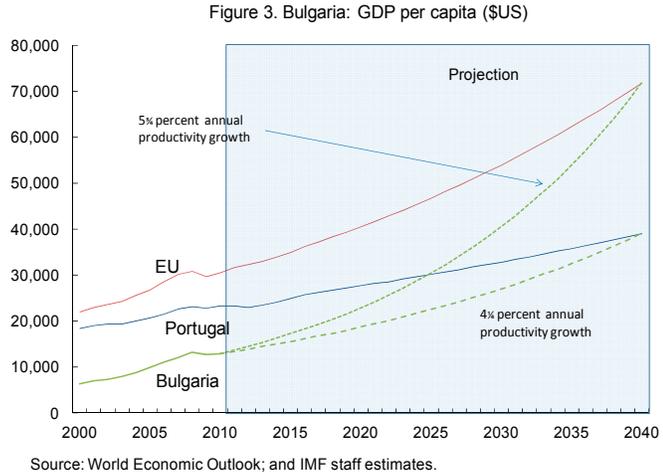


5. **Despite Bulgaria's impressive GDP growth during the recent boom, the wedge with EU average per capita GDP remains wide** (Figure 2). The income differential was about €13,800 (\$18000) in 2011. The convergence process is also complicated by a shrinking labor force, reflecting an aging population, which weighs on future GDP growth. Bulgaria's working age population has shrunk by 7.7 percent over 2000–10 and is expected to shrink about another 18.9 percent (relative to its value in 2000) by 2025.²

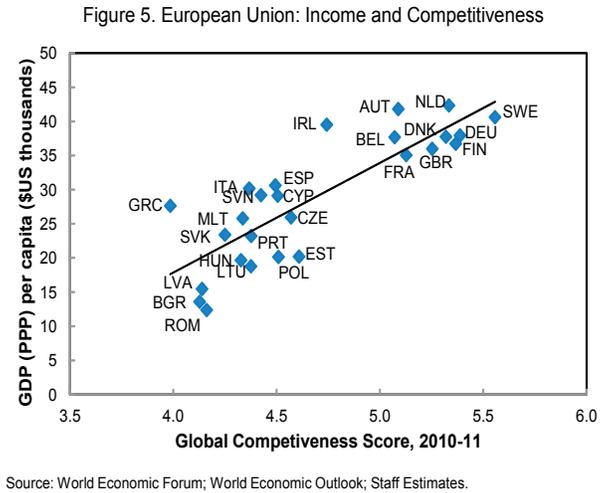
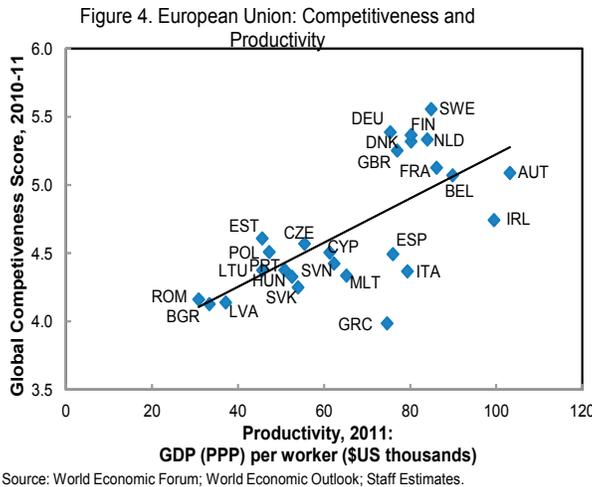


² Recent pension reforms aim to partially offset the expected decline in working age population.

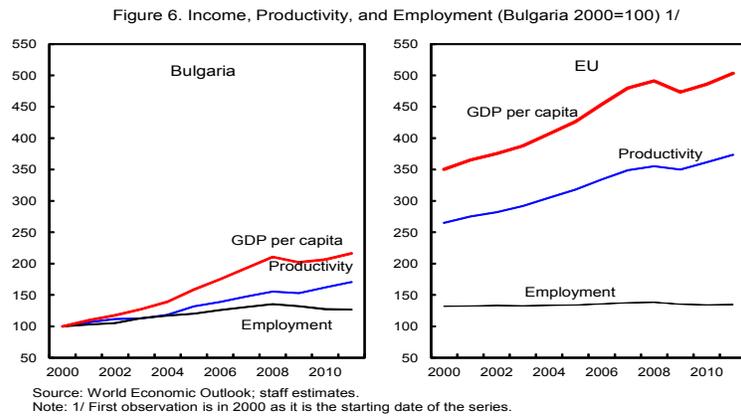
6. **Higher labor productivity growth would generate large payoffs in terms of income convergence.** If Bulgaria were to achieve sustained productivity growth of 4¼ percent per year until 2040, convergence to Portuguese income levels (the lowest of the original euro area members) would be possible. If higher productivity growth rates of 5¾ percent were achieved it would be feasible to close the gap with average EU income levels. Either scenario would still require a significant boost of Bulgaria’s average productivity growth over the past decade (3¾ percent) (Figure 3).



7. **Improved productivity growth rates would also boost GDP growth, competitiveness, and ultimately job creation.** Simple cross-country correlations suggest that improved labor productivity bolsters competitiveness, raises investment, production, and labor demand, ultimately resulting in higher income levels (Figures 4, 5).



8. **Labor productivity levels in Bulgaria lag well behind that in the EU** (Figure 6). Over the past decade increases in EU per capita GDP were mostly driven by labor



productivity growth, while employment levels remained relatively flat. In Bulgaria, productivity levels (which rose by 40 percent during 2000–06) and productivity gains were the main engine of growth.³ Between 2000 and 2006, Bulgaria's productivity growth was significantly higher than that of the EU reaching 25 percent. Real

GDP grew on average by 5.7 percent each year, with a contribution by labor of 1.1 percentage points, a contribution of capital of 0.9 point, and a growth of total factor productivity of 3.7 percent. Nevertheless, by 2010 Bulgaria's productivity level and per capita GDP were still ranked the second lowest in the EU.⁴ Consequently, in the context of income convergence, raising productivity levels is the center of discussion, where sufficiently high levels for convergence can be reached through sustained high productivity growth.

9. **While labor productivity gains were registered during the downturn, the improvement occurred at the expense of jobs.** In response to the crisis, firms cut their payroll, which resulted in 5.3 percent estimated productivity growth in 2011. Following economic recovery, these productivity gains could reverse, signs of which were already evident in the GDP data for the final quarter of 2011. Thus, developing other drivers of labor productivity stemming from structural reforms will be crucial to ensure recent employment-driven gains are translated into long lasting improvements.

10. **Higher labor productivity gains are also needed to contain the rise in real unit labor costs and maintain the country's competitiveness.** While wage growth has receded since the end of the boom, it has remained high and has exceeded productivity gains both in nominal and real terms since 2008, especially in the service sector (Figures 7 and 8). As a consequence, real unit labor costs rose sharply through 2008 to 2010 before declining in 2011, possibly reflecting the delayed adjustment in the labor market. Concretely, the decline in real unit costs that occurred in 2011 of about 3.7-3.9 percent, according to the National

³ despite some employment growth (half that of productivity growth) related to labor market changes revolving around EU accession. Employment growth during the pre-accession period largely reflected increased movement within the labor force due to elimination of lifetime employment contracts under the former communist system, World Bank (2007).

⁴ This emphasizes the importance of looking at productivity levels as countries may have high productivity growth rates but still be far from income convergence due to low productivity levels.

Statistics Institute of Bulgaria and Eurostat respectively, was not sufficient to fully unwind the rise in real unit labor costs incurred over the 2008-2010 period. As a result, real unit costs at end-2011 were 6.9 percent higher than in 2008.

Figure 7: Productivity and ULC growth (2000-2011, annual percentage change)

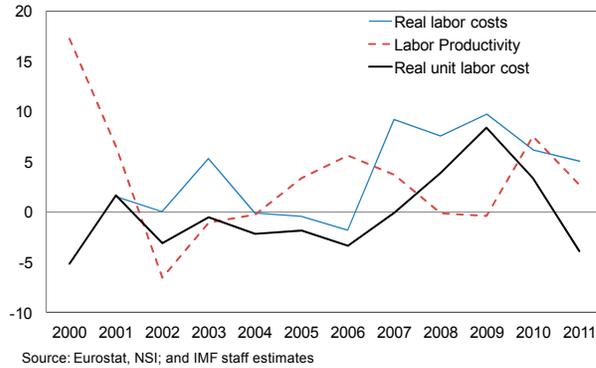
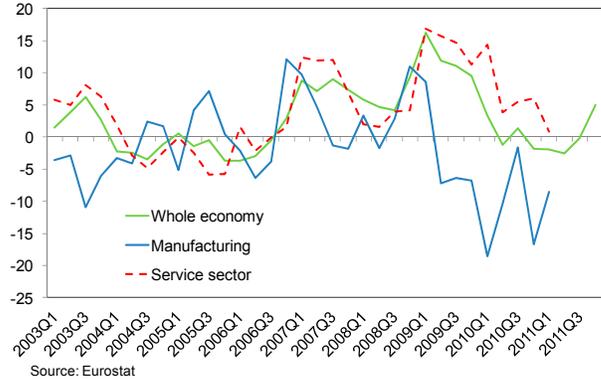


Figure 8: Gap between real wage and labor productivity growth (2003-2011, y/y, in pps)



11. **The large gap between real wage and productivity growth in the services sector, comprising wholesale and retail trade, transport and hotels, is suggestive of a skill mismatch in this sector.** Even though the job vacancy rate in this sector is close to that in the industry and low compared to the EU average (Figure 9), the fall in firms' gross operating surplus since the boom period indicates that productivity gains in the service sector have been shared with workers instead of being translated into increased profits (Figure 10) as shortages of skilled labor bid up wages.

Figure 9: Sectoral job vacancy rates, 2009-2011 (NSA, in percent)

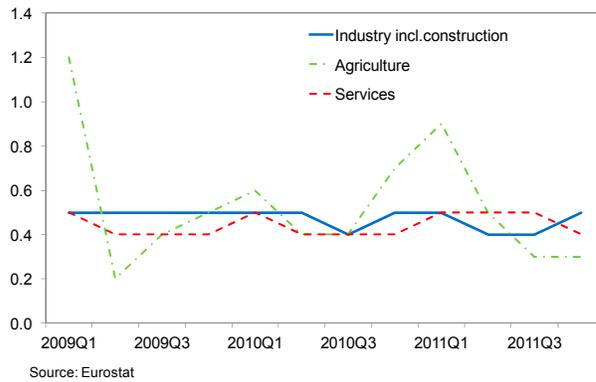
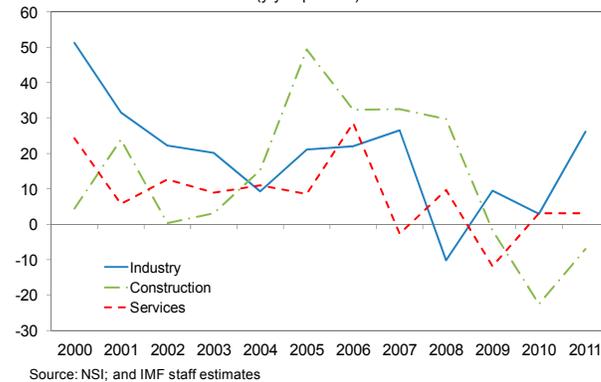


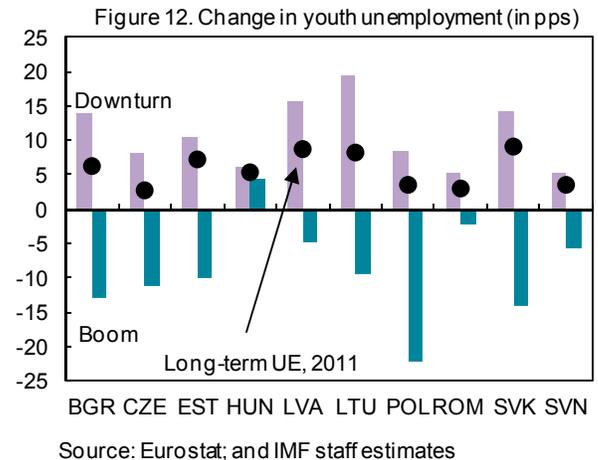
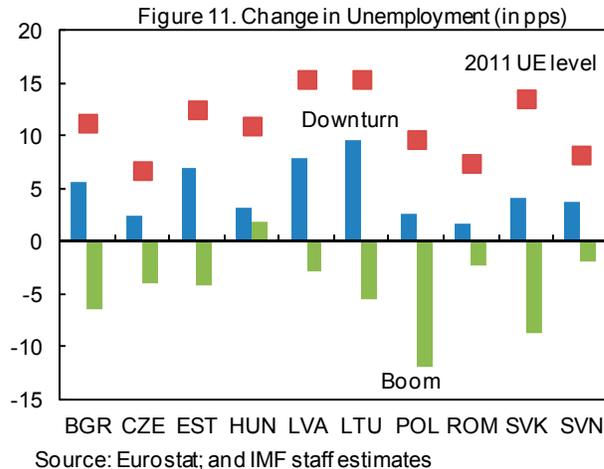
Figure 10: Gross operating surplus growth (y/y in percent)



B. A track record of high structural unemployment

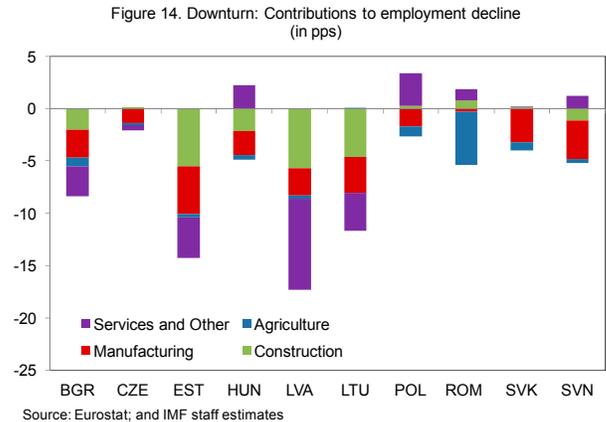
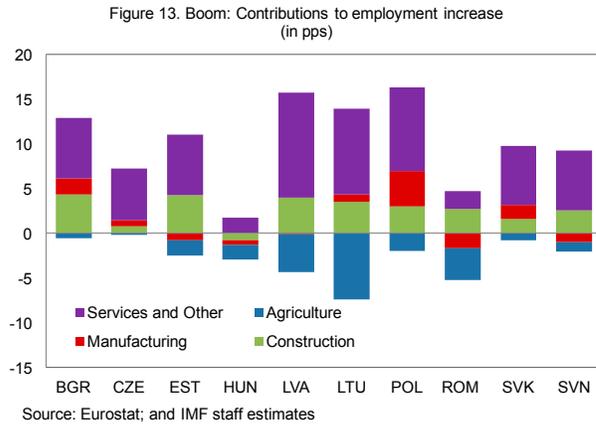
12. **The gains in employment made during the boom were largely undone during the downturn** (Figure 11). Since the start of the crisis through end-2011 employment in Bulgaria has fallen by 12 percent. Overall, around 133,000 jobs per year were lost in the crisis, compared to 100,000 jobs created per year during the boom. Yet, Bulgaria compares favorably to the rest of the NMS in terms of job intensity of economic growth during 2003-

2007. With a job creation elasticity to GDP growth of 47 percent meaning that a one-point increase in GDP growth brings about a 0.5 point increase in employment growth, Bulgaria ranked the highest among the NMS, more than twice as high as the regional average, even though unemployment fell more in Poland and Slovakia during that period. The challenge that arises is that because the recovery in growth in Bulgaria since the crisis has been weak by regional standards, progress in reducing unemployment has been slow. Assuming that GDP growth reaches 2 percent per year it would take more than 10 years to bring the unemployment rate back to its pre-crisis low of 5.6 percent. A lower growth rate would not allow the unemployment rate to decline.

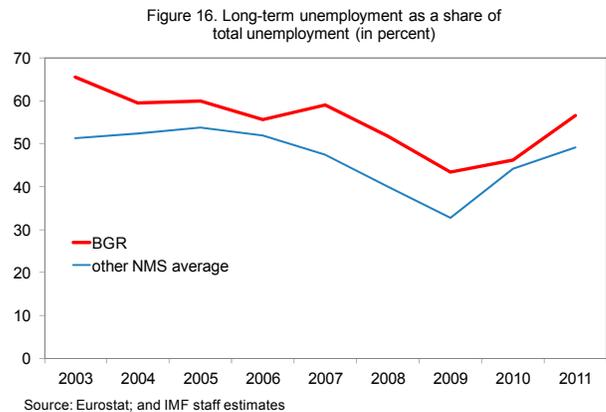
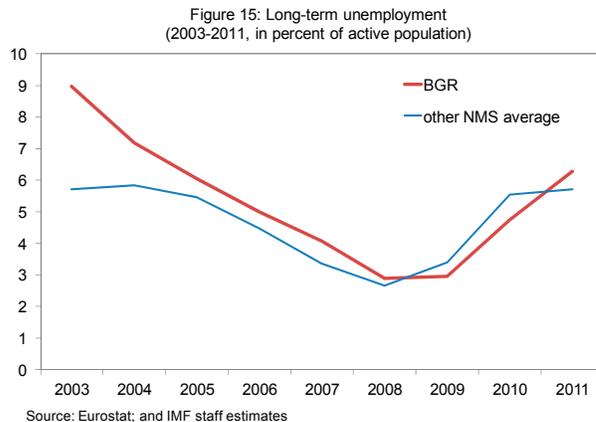


13. **The high degree of labor shedding during the downturn may reflect the nature of job creation in the boom.** Most job created during the boom were in sectors highly sensitive to demand shocks, such as in construction, services, and low value added manufacturing activities (Figure 13). When the crisis hit, the massive layoffs took place in the same sectors (Figure 14). Three types of factors can explain this. First, the manufacturing sector accounted for a larger share of the losses in the downturn than of jobs created during the upturn. This may be linked to the sectoral composition of Bulgarian exports, with a large share accounted for by products that were cut back by European consumers during the 2008-2009 downturn. Second, a cross-analysis with wage growth data suggests a lack of wage adjustment to economic conditions in the service sector, which caused a massive employment adjustment. While the concentration of job destruction in these sectors was observed to some extent in other NMS too, this suggests that the job creation process in Bulgaria is not oriented towards high value added sectors but undermined by a lack of labor productivity and extensive skill mismatches. Finally, the sharp rise in unemployment in Bulgaria in the downturn may reflect the more cyclical nature of the Bulgarian economy and the greater ease of laying off staff compared to other European countries, as shown by various studies.⁵

⁵ According to the OECD Employment protection index, with an index of 1.9, Bulgaria had a lower index in 2007 than the 2004 EU New Member States (average of 2.2) and the old Member States (average of 2.4).



14. **The persistence of long term unemployment highlights structural problems in the Bulgarian labor market.** Since 2008, registered unemployment has risen by 5.5 percentage points and now stands at 11.1 percent of the labor force, with long-term unemployment reaching 6.3 percent. This may signal again the highly cyclical nature of the Bulgarian economy as both the overall unemployment rate and the long-term unemployment rate fell more during the boom and rose more during the downturn than the other NMS average (Figure 15). However, the share of long term unemployment in total unemployment remained well above the other NMS average over the whole period and remained above 50 percent most of the time (Figure 16).



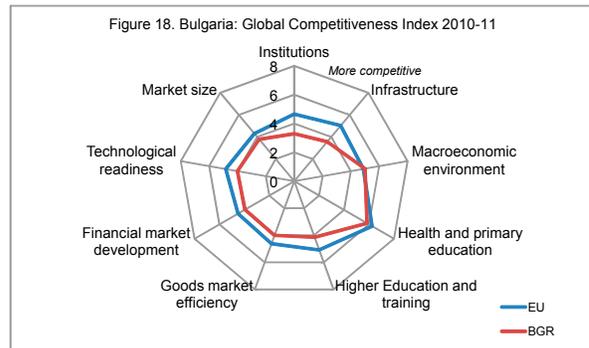
15. **For the youth, the risk of long-term unemployment is high.** Youth unemployment, traditionally high, rose to 26 percent in 2011 (double that in 2008) (Figure 12). While developments in youth unemployment closely mirror those in overall unemployment - with a larger drop in Bulgaria than in the other NMS average during the boom and a larger rise in the downturn - youth unemployment in Bulgaria remained consistently higher than the regional average for most of the period, suggesting labor market entrants lack the skills needed to be competitive in the market or possibly even suggesting a dual labor market. The difficulties in finding jobs combined with the comparatively low wage level have been major drivers of emigration by Bulgarian youth. The brain drain to the rest of Europe contributed to

the 6.7 percent decline in total labor force since 2008, with 16 percent of the population having reportedly emigrated in 2010 and an additional 20 percent willing to do so.

III. STRUCTURAL DRIVERS OF PRODUCTIVITY GROWTH

16. **Economic studies⁶ show that the most important determinants of growth are higher education, goods market efficiency, innovation and sophistication, and quality of infrastructure and institutions.** The growth rate of real per capita GDP is usually found to be positively related to initial human capital, proxied by school enrollment rates (Barro, 1991). More recently, information and communication technology investments and the role played by labor market regulation in their adoption were highlighted as important factors of productivity divergence between industrial countries (Gust and Marquez, 2004; Belorgey et al., 2006), helping explain the concentration of employment amongst the most productive members of the workforce.

17. **International indicators point to various factors hindering labor productivity and affecting the business environment and more generally competitiveness.** Bulgaria's weakest ranking in the World Bank Doing Business Indicators (Figure 17) and Global Competitiveness Index (Figure 18) are primarily in the areas of institutions, infrastructure, and goods market efficiency where the gap to the EU average is large.



Source: World Bank Doing Business Indicators, Global Competitiveness Index.

⁶ In particular, Barro (1991), Christiansen et al (2009), Belorgey et al (2006), Bourles et al. (2007), and Gust et al (2004).

18. **The areas put forward by economic studies as important determinants of growth are also found to have greatest significance in a cross-country regression of labor productivity on the main global competitiveness indicators that includes Bulgaria.** To

identify the key determinants of productivity growth and their relative impact, our analysis estimates the relationship between productivity and several of macroeconomic and institutional indicators gathered from 76 countries, mainly advanced and middle income countries, excluding large oil producers and extremely poor countries. As the model identification comes mostly from the cross-sectional dimension, annual productivity growth in logarithms is estimated by a cross-sectional Ordinary Least Square (OLS) model including 60 potential determinants, with country data being averaged over 2000-2010. The key determinants are narrowed down into 11 categories: institutions, infrastructure, financial market development, goods market efficiency, health and primary education, higher education, innovation and sophistication, labor market efficiency, macroeconomic environment, market size, and technological readiness (Annex 1 provides further details).⁷

Table 1. Regression Results 1/

Dependent variable = Log of Productivity	
Institutions	0.0 *
Infrastructure	0.2 *
Financial Market Development	0.0
Goods market efficiency	0.3 *
Health and primary education	-0.2
Higher education	0.2 *
Innovation and Sophistication	0.4 *
Labor market efficiency	0.0
Macroeconomic environment	0.0
Market size	0.0
Technological readiness	-0.3
Constant	11.4 ***
R-square	0.7
Observations	76

1/ The poorest LICs and oil producers are excluded

*, **, *** represent significance at the 10, 5, and 1 percent levels, respectively

Therefore the model is expressed as follows:⁸

$$\begin{aligned} \text{Log Pr od}_i = & \beta_0 + \beta_1 \text{Inst}_i + \beta_2 \text{Infra}_i + \beta_3 \text{Fin}_i + \beta_4 \text{Goods}_i + \beta_5 \text{Health}_i + \beta_6 \text{High}_i \\ & + \beta_7 \text{Innov}_i + \beta_8 \text{Labor}_i + \beta_9 \text{Macro}_i + \beta_{10} \text{Market}_i + \beta_{11} \text{Techno}_i + \beta_{12} \text{Capital}_i + \varepsilon_i \end{aligned} \quad (1)$$

where subscript i denotes country i ; β_0 is the constant and ε_i the residual of the equation.

The results of equation (1) estimation (Table 1) show that five variables have a significant positive effect on labor productivity growth: institutions, infrastructure, goods market efficiency, higher education, innovation, and education.

To determine how improvements in these indicators could impact productivity growth in Bulgaria, the coefficients estimated in equation (1) are applied to Bulgaria in an out of

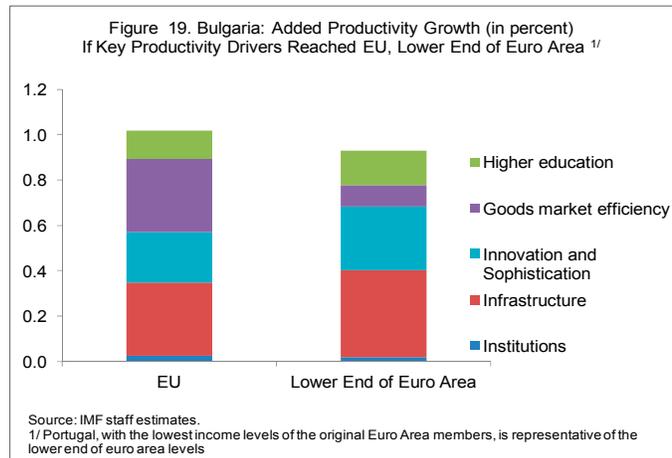
⁷ Higher education includes secondary and tertiary education as well as vocational, management, and staff training.

⁸ Since the log of productivity is the left hand side variable, each regression coefficient represents the percent change in productivity for a one unit change in the right hand side variables. The right hand side variables are the primary criteria for the global competitiveness index, which largely includes criteria from the World Bank Doing Business Indicators. Similar results are obtained by applying the productivity growth rates.

sample estimation to determine the effect on labor productivity growth if the country caught up the EU average for each given area. Thus, the increase in labor productivity by reaching EU levels in each of these areas is measured through the multiplication of the regression coefficient for a given area with the differential of the corresponding indicator between the Bulgaria and the EU after estimating the following equation:

$$\Delta Pr od_{BGR} = \hat{\beta}_0 + \hat{\beta}_1(Inst_{EU} - Inst_{BGR}) + \hat{\beta}_2(Infra_{EU} - Infra_{BGR}) + \hat{\beta}_4(Goods_{EU} - Goods_{BGR}) + \hat{\beta}_6(High_{EU} - High_{BGR}) + \hat{\beta}_7(Innov_{EU} - Innov_{BGR}) \quad (2)$$

19. **The results show that for Bulgaria, closing the gap with the EU average in these areas would permanently boost productivity growth by a total of 1 percentage point (Figure 19).** In each of the areas listed above as most significant for raising labor productivity (measured by the global competitiveness indicators) Bulgaria ranks well below the EU average. Raising Bulgaria's standards to the EU average in each of these areas would boost Bulgaria's average productivity growth by one percentage point relative to its average rate of about around 3¾ percent over the past decade. The largest gains would come from raising infrastructure quality and goods market efficiency to that of the EU, where each would yield one third a percentage point of productivity growth. Strikingly, the small regression coefficient of institutions meant the smallest gains in productivity would come from addressing institutional deficiencies, where the gap with the EU is large. Similar gains in productivity growth can be achieved by targeting the standards of higher education, goods market efficiency, innovation and sophistication, infrastructure and institutions as countries whose income levels are at the lower end of the euro area. Since in this case the differential of standards in goods market efficiency is low, fewer productivity gains are achieved in this area. In contrast, greater productivity gains stem from innovation and sophistication where the differential in standards is greatest.



IV. POLICIES

20. **The Bulgarian National Reform Program (NRP) targets reforms in many of these areas.** The NRP sets out a far reaching list of reforms in the areas of higher education, goods market efficiency, innovation and sophistication, and quality of infrastructure and institutions, where Bulgaria mostly lags behind its peers that are seen as key to achieving substantial progress in the areas holding the greatest potential to boost Bulgaria's productivity (Figure 20). This section we discuss these reforms also some additional ones to complement the NRP. The detailed descriptions of each challenge reflect discussions with the Bulgarian authorities, labor unions, employers' associations, private banks, and World Bank (2007).

21. **Multiple areas where structural reforms can boost labor productivity are outlined in the 2011-15 NRP and global surveys.** The NRP emphasizes reduction of administrative burdens, improving the quality of infrastructure and education, deepening financial markets and business products, and developing market-oriented research and innovation. Many of the reforms in the NRP will also help reduce corruption (Bulgaria ranks 73rd out 178 countries in the Corruption Perception Index) and the grey economy, which in turn will improve the business environment and labor productivity.

22. **The quality of higher education can be improved with both immediate and longer term measures.** A mismatch of educational skills and employers' needs has been a large impediment to productivity in Bulgaria. This applies not only to vocational skills but in a variety of areas ranging from language and computer skills to management skills. Consequently, better job placement services (including centralized computer matching services) and more targeted vocational, technology and language training programs are already being financed with EU social funds and are supported by trade unions.⁹ Measures with longer-term benefits for productivity, envisaged in the NRP, include active coordination of tertiary and vocational education design with employers' needs (especially in tradable sectors) combined with a national system for skills forecasting, apprenticeships, and individual counseling through labor offices. Programs updating skills of older workers will also help improve productivity.

23. **Goods market efficiency improvements will require targeted administrative reforms.** Productivity is hampered by the burden of customs procedures, cumbersome rules and regulations obstructing entry into various business areas and obstructing day-to-day operations, inconsistent enforcement, and excessive administration fees and local taxes. Trade unions view this area as one of the largest impediments to FDI.¹⁰ The momentum from recent public administration and regulatory reforms, including down-sizing of staff and reducing the cost of starting a business from almost 10 to 0 percent of per capita income between 2008 and 2010, needs to continue. Further necessary measures from the NRP that

⁹ Recovery through Growth and Employment (2010).

¹⁰ Recovery through Growth and Employment (2010).

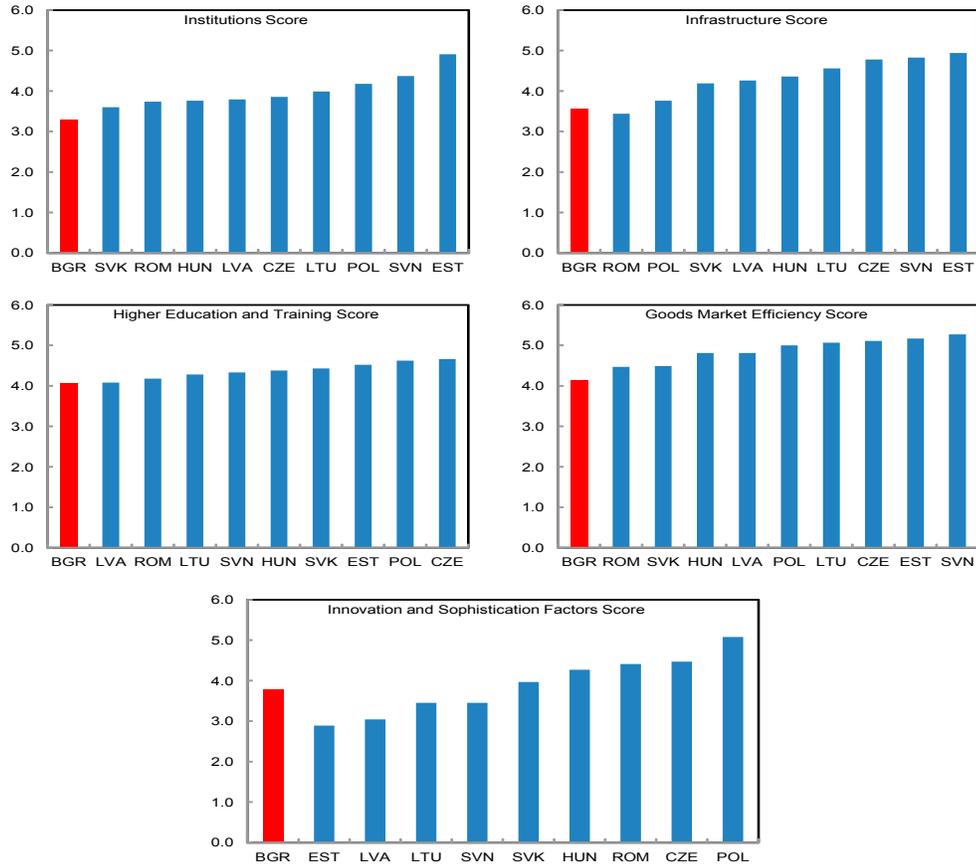
should be especially targeted at local governments include: (i) reducing the number of procedures and putting into operation e-governance infrastructure organized to provide a single point of contact for complying with central and local government licensing, permits, and fees, which will increase transparency and consistency while reducing duplication of rules; (ii) drafting a law on Local Self-governance and Local Administration restricting local authorities' ability to administer regulatory regimes which have not been stipulated in the law; (iii) improved enforcement through training central and municipal authorities on how to implement rules and regulations consistently and random monitoring; and (iv) implementation of silent approval for business registration, meaning requests are automatically approved if the authorities do not respond within a certain amount of time. A key proposal outside the NRP, for reducing compliance time is across the board implementation of automatic approval of most procedures, including applications for licenses and permits (not just for initial business registration).

24. **Public-private collaborative efforts as well as a recovery in FDI inflows can stimulate innovation and sophistication.** A lack of technological absorption capacity poses a barrier to the adoption of the latest and most-advanced productivity-enhancing technologies. Research and development in this area is not performed by the government, while firms are limited by financing constraints. Further to the NRP suggestions in this area, long-term public-private coordinated research targeted at technology adoption, for example through technology parks (which can be financed with EU funds), would be very important to facilitating technological absorption. Further coordination of national and EU research via Bulgaria's scientific research fund (financed by EU funds) would also be useful. Financing constraints can be eased through competitive use of the National Science Fund (as prescribed in the NRP), reducing bank financing risks through more effective protection of intellectual property rights, and educating banks on the merits lending for research and development.

25. **Major investment is necessary to improve the quality of infrastructure.** Poor quality of roads and railways place a burden on firms operations, and is a barrier to labor mobility and trade—obstructing Bulgaria's role as a conduit for trade, for example between Turkey and the EU. Meanwhile poor energy infrastructure raises firms operating costs. Plans for restructuring the railway sector, supported by the World Bank, will modernize the railway network over three years and ensure its financial stability. Several projects for developing important highways (Trakia Motorway, Struma Motorway) and bridges, financed with EU funds, are already progressing. However, keeping in mind the importance of bolstering macroeconomic stability under a currency board by avoiding large budget deficits, plans for monitoring quality and maintenance, still need to be more thoroughly outlined, as do plans for revamping the energy infrastructure (beyond basic efficiency-enhancers).

26. **Finally, judicial reforms would significantly improve institutional challenges faced by businesses.** Firms face major obstacles in terms of time and consistency when dealing with the judiciary, especially at local levels. Commonly this issue emerges in the context of contract enforcement. A comprehensive reform of the system is called for but will take time. In the meantime, establishing internet portals by district courts posting time to resolution of each case and decisions would increase transparency and help address governance issues. More effective and less costly enforcement of contracts would also reduce the number of firms breaching contracts.

Figure 20. Bulgaria: Global Competitive Index, 2011



Source: World Economic Forum.

V. CONCLUSIONS

27. **Low labor productivity levels are holding back Bulgaria's convergence with the EU.** In the context of an aging population, weaknesses in the business environment and higher education weigh on productivity and more generally competitiveness. Increased competitiveness would raise firms' investment, production, and labor demand, resulting in higher income levels and jobs. Achieving such productivity levels, though, will require high sustained productivity growth achieved through ambitious structural reforms. While these reforms are in Bulgaria's self-interest, their effects will take time to materialize anyway.

28. **The job creation process could be improved by resolving the skill mismatch and reorienting job creations towards high value added sectors.** This means that the government should consider implementing reforms that not only raise economic growth but also increase the job content of economic growth.

29. **Large improvements in productivity can be achieved by focusing on a handful of ambitious reforms.** Global surveys and the portion of the NRP addressing competitiveness and productivity identify numerous areas for structural reform. However, empirical analysis indicates specific reforms (many already identified in the NRP) in higher education, goods market efficiency, innovation and sophistication, and quality of infrastructure and institutions hold the greatest potential to boost Bulgaria's productivity. Matching educational skills with employers' needs would not only boost productivity but also reduce unemployment. Increasing research and development effort will ease the adoption of the latest and most-advanced productivity-enhancing technologies. Better road and railway transport will be key to supporting trade with Europe and reducing Bulgaria's regional disparities. Increasing transparency and predictability of rules and regulations, especially at the regional and local levels, will improve good market efficiency through reduced administrative burdens facing businesses. Meanwhile, judicial reforms will reduce institutional barriers, including reliability of contract enforcement.

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Annex

The empirical analysis was centered around a cross-country regression of labor productivity on institutional quality, infrastructural quality, financial market development, goods market efficiency, health and primary education, higher education, innovation and sophistication, labor market efficiency, macroeconomic environment, market size, and technological readiness (all pillars of the global competitiveness index), as well as capital and a constant. The definitions of the global competitiveness pillars applied are as follows:

- *Institutional quality* is determined by the legal and administrative framework within which individuals, firms, and governments interact to generate income in the economy.
- *Infrastructural quality*, in terms of extensiveness and efficiency, covers roads, railways, ports, airlines, electricity and telecommunications. It is crucial for ensuring the effective functioning of the economy – particularly the location of economic activity and the kinds of activities or sectors that can develop in a particular economy.
- *Financial market development* ensures efficient allocation of resources saved by a nation's citizens, and those entering from abroad, to their most productive uses. Availability and affordability of financial services, equity market financing, ease of access to loans and venture capital are amongst the main measures of this variable.
- *Goods market efficiency* reflects the quality of the environment for the exchange of goods. It includes the burden of administrative procedures (including customs), degree of customer orientation, intensity of local competition, the effect of taxation on businesses, and number of procedures required to start a business.
- *Health and primary education* reflects a combination of incidences of major illnesses (such as malaria, tuberculosis, HIV/AIDS), infant mortality, life expectancy, quality and enrollment of primary education.
- The *quality of higher education*, crucial for economies to move up the value chain, includes secondary and tertiary enrollment rates, assessments on the overall quality of education as well as a focus on management and math and science.
- *Innovation and business sophistication* and reflect both the ability to integrate and adapt technologies as well as conduciveness to efficiency in the production of goods and services. This measure includes private and public research and development expenditures, quality of research institutions, availability of scientists and engineers, cluster development, value chain breadth, and production process sophistication.
- *Labor market efficiency* includes a combination of ease of labor-employee relations, flexibility of wage determination, and hiring and firing practices.

- The *macroeconomic environment* is measured as function of the budget balance, national savings rate, inflation, interest rate spread, government debt, and credit ratings.
- *Market size* is measured by the size of domestic and foreign markets a country is regularly accessing.
- *Technological readiness* reflects internet users, subscriptions, and bandwidth, as well as technological transfer and availability.