

### **Czech Republic: Selected Issues**

This Selected Issues paper for the Czech Republic was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on January 7, 2008. The views expressed in this document are those of the staff team and do not necessarily reflect the views of the government of the Czech Republic or the Executive Board of the IMF.

The policy of publication of staff reports and other documents by the IMF allows for the deletion of market-sensitive information.

**To assist the IMF in evaluating the publication policy, reader comments are invited and may be sent by e-mail to [Publicationpolicy@imf.org](mailto:Publicationpolicy@imf.org).**

Copies of this report are available to the public from

International Monetary Fund • Publication Services  
700 19<sup>th</sup> Street, N.W. • Washington, D.C. 20431  
Telephone: (202) 623-7430 • Telefax: (202) 623-7201  
E-mail: [publications@imf.org](mailto:publications@imf.org) Internet: <http://www.imf.org>

Price: \$18.00 a copy

**International Monetary Fund  
Washington, D.C.**

INTERNATIONAL MONETARY FUND

THE CZECH REPUBLIC

**Selected Issues**

Prepared by Thomas Dalsgaard, Sònia Muñoz, and  
Anita Tuladhar (EUR)

Approved by European Department

January 7, 2008

	Page
I. Tax and Welfare Reform in the Czech Republic—Structural Implications and Challenges .....	4
A. Introduction .....	4
B. The Backdrop for Reform .....	4
C. The Reform Package—Key Features .....	10
D. Analysis and Assessment of the Reform Package .....	13
E. A Way Forward .....	41
F. Conclusion .....	47
Figures	
1. Tax Structure in Selected Countries, 2004 .....	6
2. Labor Participation Rates in Selected Countries, 2006 .....	6
3. Hours Worked in Selected Countries, 2006 .....	7
4. Participation Rates Among the Younger and Older Generations, 2006 .....	7
5. Unemployment Rates, 2006 .....	8
6. Long-Term Unemployment in Percent of Total Unemployment .....	9
7. Average Effective Tax Rates .....	15
8. Marginal Effective Tax Rates .....	17
9. Marginal Effective Tax Rates Before and After Transfers (2008) .....	20
10. Average Tax Wedges (2008) .....	23
11. Average Tax Wedges in Selected Countries .....	24
12. Average Effective Tax Rates in Selected Countries .....	25
13. Marginal Effective Tax Rates in Selected Countries .....	27
14. Top Marginal (all-in) Tax Rate on Personal Income .....	29
15. Statutory Corporate Income Tax Rates in Selected Countries .....	30
16. All-in Rates on Dividend Income in Selected Countries .....	30
17. AETR's in Selected Countries .....	32

18. METR's in Selected Countries .....	33
19. Distribution of the Subsidy Implied by the Low VAT Rate.....	35
20. Distribution of Increase in Expenditures from Raising Low Rate from 5 to 9 Percent.....	35
21. Benefits (children and accommodation), 2006 and 2008 .....	38
22. Benefits (children and accommodation), Singles and Couples, 2006 and 2008...	38
23. Overall Reduction in Marginal Taxation for High Income Earners .....	39
Tables	
1. Key Selected Changes in Tax and Benefit Systems, 2006–08 .....	14
2. Composite Marginal Tax Take: How Much is Taxed Away When Earnings Increase by CZK 100,000 Annually .....	21
3. Composite Tax Take When Moving from Unemployment or Social Transfer to Employment .....	21
Boxes	
1. Experience with Flat Tax Reforms in Central and Eastern Europe.....	12
2. Replacing Social Security Contributions with PIT and VAT? .....	42
3. Summary of Recommendations .....	48
References.....	49
Appendix	
I. Key Elements of Reform Package.....	53
II. Tax and Pension Reform in the Czech Republic—Implications for Growth and Debt Sustainability.....	56
A. Background.....	56
B. Fiscal Challenges and Demographic Pressures.....	57
C. Analytical Framework.....	60
D. Assessing the Fiscal Reform Package.....	61
E. Adjustment Strategies to Achieve the Medium Term Objective .....	65
F. Achieving Long Term Sustainability: Pension Reform Proposals.....	66
G. Conclusions.....	72
Figures	
1. Demographic Indicators, 2004–50.....	58
2. Long-Term Fiscal Pressures in the Czech Republic.....	59
3. Debt Dynamics from Population Aging in the Czech Republic .....	59
4. Macroeconomic Effects of Tax Reform .....	62
5. Macroeconomic Effects of Tax Reform and Expenditure Restraint.....	64
6. Deficit and Debt Dynamics with 1 Percent of GDP Deficit in 2012 .....	65

7. Comparing Alternative Measures to Reach 1 Percent of GDP Deficit by 2012.....	66
8. 1-Percent of GDP Deficit by 2012 Through Reform Package and Raising Retirement Age .....	67
9. Comparing Alternative Strategies to Achieve Debt Sustainability .....	68
10. Pension Reform from 2012 Onwards After 1-Percent of GDP Deficit Through Package .....	71
Table	
1. Estimates of Impact of Key Fiscal Reform Measures .....	61
References.....	74
Appendix	
I. Analytical Framework .....	75
II. Sensitivity Analysis.....	79
III. Challenges to Monetary Policy—An Integrated Monetary and Fiscal Model-Based Analysis .....	80
A. Challenges for Monetary Policymaking .....	80
B. Brief Description of the Model .....	83
C. Impact of the Fiscal Package.....	85
D. Prospects for Monetary Policy in the Period Ahead.....	88
E. Effects of Reducing the Target Rate of Inflation .....	90
F. Conclusions .....	92
References.....	93
Appendix	
I. Calibration Parameters .....	94
Appendix Figures	
1. Tax Shocks, 2007–15.....	97
2. Fiscal Shocks, 2007–15 .....	101
3. Fiscal, Output Gap, Wage and Depreciation Shocks, 2007–15.....	105
4. All Shocks and Reduction in Inflation Target, 2007–15 .....	109

## I. TAX AND WELFARE REFORM IN THE CZECH REPUBLIC— STRUCTURAL IMPLICATIONS AND CHALLENGES<sup>1</sup>

### A. Introduction

1. **The Czech Republic is facing substantial fiscal challenges in coming years and decades.** The key short-term priority is to meet the obligation under EU's Stability and Growth Pact to reduce the government deficit below 3 percent of GDP. The longer term challenge is to ensure a sustainable fiscal position as demographic developments imply rapid and significant increases in pension and health care spending. Meeting these challenges will require major reform of government spending and taxation, while also taking into account structural implications – such as labor market participation, the level and structure of unemployment, tax competition, and income distribution. The underlying question is how to combine broad public and political support for a comprehensive welfare state with the inescapable requirement to maintain healthy government finances.
2. **A number of tax and welfare measures have been implemented in recent years, most of which have tended to raise the fiscal deficit (such as the 2006 tax cuts and the 2006/07 benefit increases).** Spending reforms, in particular for health and pensions, have not been implemented as envisaged, and other attempts to curb government deficits, such as the 2004 Medium Term Expenditure Framework and planned cuts in government staff, have had little impact. Most recently, an ambitious and comprehensive reform package has been passed (starting in 2008), aiming both at improving government finances, strengthening labor supply and mitigating the effects from tax competition.
3. **This paper takes a closer look at the reform package, as well as measures introduced in 2007.** Section B below briefly reviews the backdrop for fiscal reform, section C outlines the key reform measures, section D analyses their structural implications (impact on incentives and distribution). Section E proposes possible measures going forward and section F concludes.

### B. The Backdrop for Reform

#### Fiscal position

4. **The government deficit is projected at just above the 3 percent EU-threshold in 2007, further declining below the threshold in the following years.** Maintaining the deficit below 3 percent will remain a key near-term challenge, especially if cyclical developments turn less benign than projected. However, more substantial deficit reduction is required to meet the long term spending pressures from the ageing population. The Ministry of Finance

---

<sup>1</sup> Prepared by Thomas Dalsgaard (EUR).

estimates the so-called fiscal gap (the permanent improvement of government balances required for long run fiscal sustainability) at about 8 percent of GDP.<sup>2</sup> The long-term spending pressures in the Czech Republic are more substantial than in most other EU and OECD countries (The European Commission, 2006).

**5. The serious fiscal circumstances requires ongoing and firm prioritization and scrutinizing of spending and taxation.** In particular, new spending plans or revenue losing tax cuts should be carefully considered and generally be avoided unless there are highly compelling reasons to undertake such initiatives.

### **Tax composition**

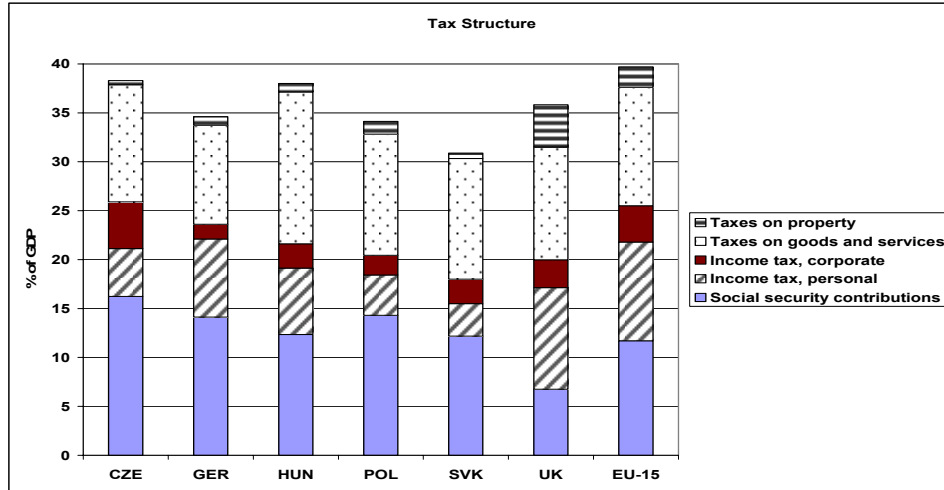
**6. The Czech tax/GDP ratio of about 38 percent is slightly lower than the EU-15 average, but higher than the tax ratios of e.g. Poland and Slovakia (Figure 1).**<sup>3</sup> The tax structure stands out from the EU-15 average and other countries in the region by relying more heavily on social security contributions (which are among the highest in the world) and the corporate income tax, and less on taxation of personal income, consumption and property. This suggests that revenue enhancing tax reform could focus on increased taxation of consumption and property as well as shifting some of the burden from social security contributions onto the personal income tax or other taxes, as discussed below.

---

<sup>2</sup> The Ministry of Finance (2007a). The Ministry also finds that, in order to meet the EU requirement for government debt not to exceed 60 percent of GDP at any point in time, an improvement in the government balance of about 4 percent of GDP is necessary. This could be interpreted as a minimum long-term requirement for improvement in the government balance.

<sup>3</sup> Throughout the paper we compare, whenever possible, with three other new EU member countries and regional competitors (Poland, Hungary and Slovakia), two established EU members with widely differing tax and social systems (Germany and the United Kingdom) as well as the EU-15 average.

Figure 1. Tax Structure in Selected Countries, 2004

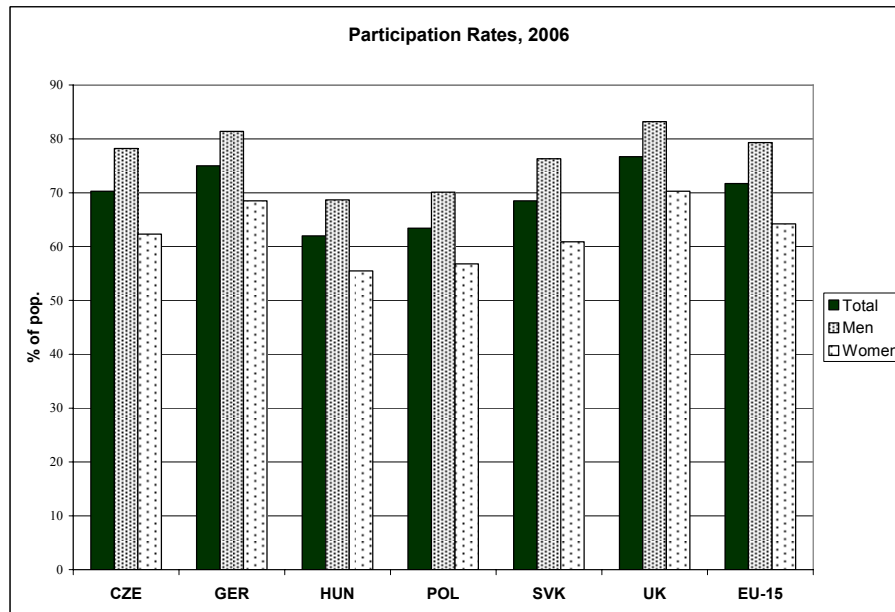


Source: OECD, Revenue Statistics, 2006.

## Labor markets

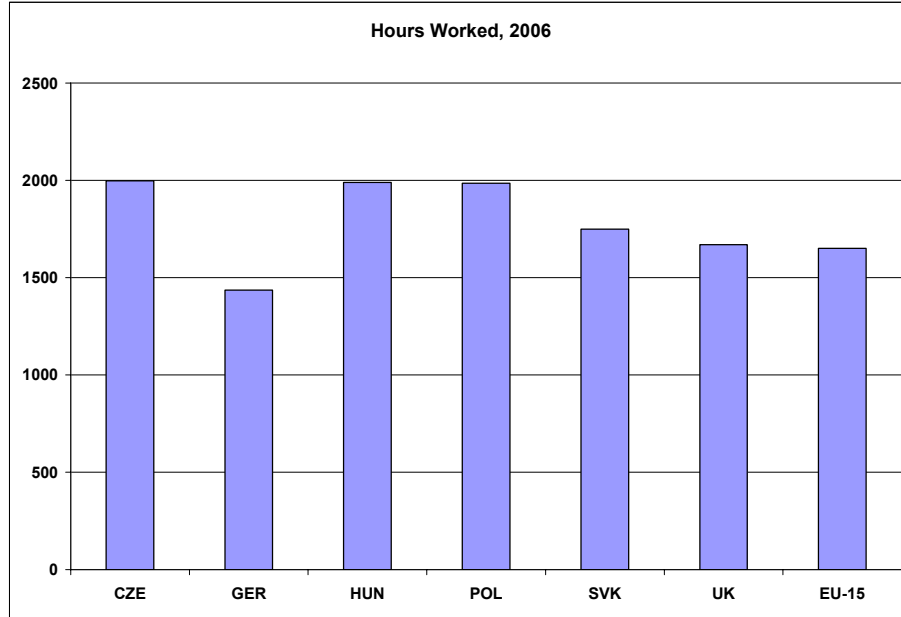
7. **Labor participation is at par with the average EU-15 level, and higher than elsewhere in the region, both for men and women (Figure 2).** The United Kingdom and Germany (as well as the Nordic countries) stand out as having somewhat higher overall participation rates. On the other hand, hours worked in the Czech Republic and other New Member States (NME's) tend to be substantially higher—by up to 30 percent—than in EU-15 (Figure 3).

Figure 2. Labor Participation Rates in Selected Countries, 2006



Source: OECD (2007a).

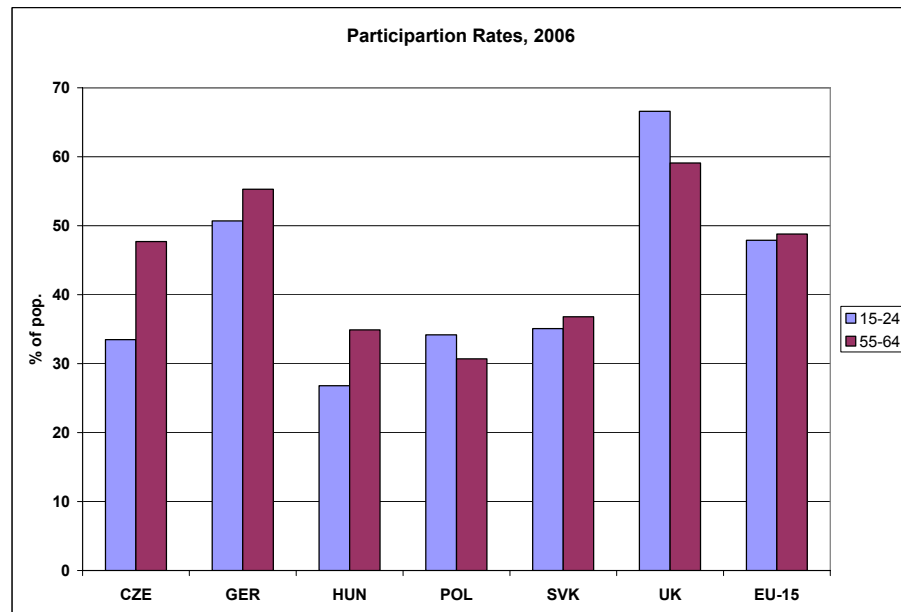
**Figure 3. Hours Worked in Selected Countries, 2006**



Source: OECD (2007a). Note: these are actual annual hours worked, including employed and the self-employed.

8. **Participation among the older generations on the labor market (55-64 years of age) is broadly in line with the EU-15 average and somewhat above other countries in the region.** Youth participation (15-24 years of age), while in line with regional levels, is much lower than the EU-15 average and has declined over the past four years (Figure 4), reflecting to a large extent higher inflow to secondary and tertiary education.

**Figure 4. Participation Rates Among the Younger and Older Generations, 2006**

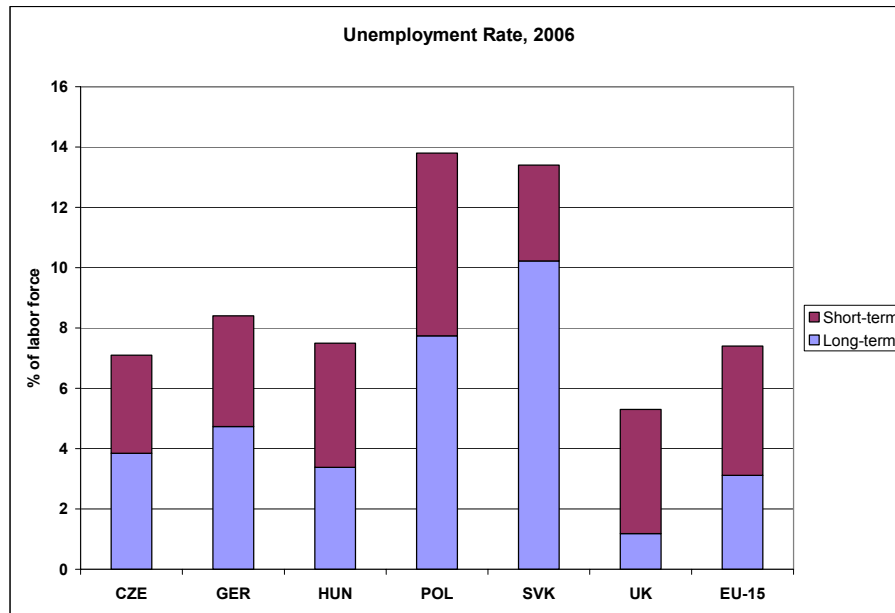


Source: OECD (2007a).



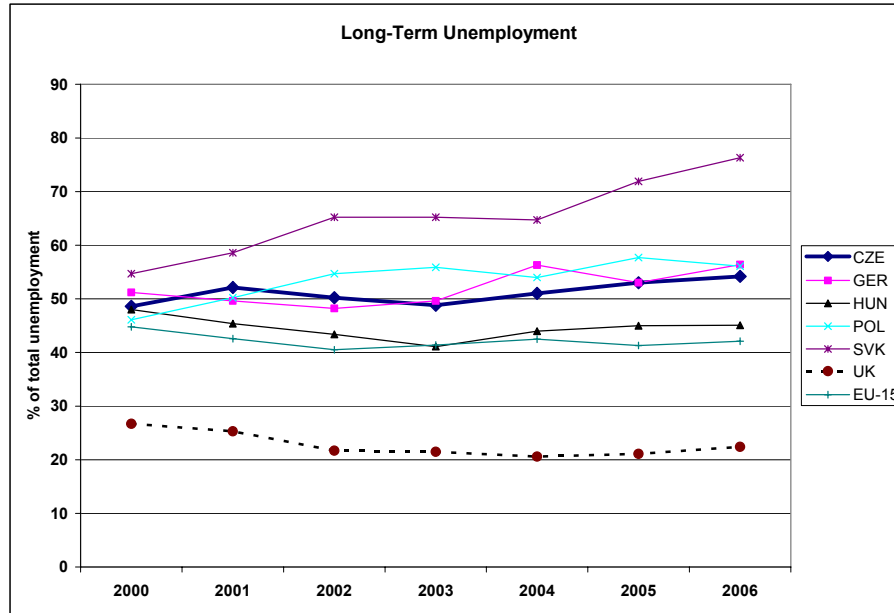
9. **The unemployment rate has declined substantially over the past few years, at least in part reflecting a strong cyclical upswing.** The unemployment rate, based on labor force surveys, was about 7 percent in 2006 and has declined further to below 6 percent in 2007, lower than both the EU-15 average and that of other countries in the region (Figure 5).<sup>4</sup> The EU-Commission calculates that long term unemployment makes up for about 50-55 percent of unemployment, a number that remains stubbornly high even as the overall unemployment rate has been substantially reduced (Figure 6). The relatively high and persistent incidence of long-term unemployment is a characteristic the Czech Republic shares with other NME's (Schiff and others, 2006).

**Figure 5. Unemployment Rates, 2006**



Source: Eurostat.

<sup>4</sup> The current unemployment rate is substantially below recent national estimates of the rate of structural unemployment (the NAIRU) at about 7-7.5 percent (Benes and N'Diaye, 2004; Hurník and Navrátil, 2005)—a level broadly in line with the euro-zone average, but somewhat above levels in for instance the United Kingdom, the Netherlands, Denmark and Sweden (OECD, 2007a).

**Figure 6. Long-Term Unemployment in Percent of Total Unemployment**

Source: Eurostat.

10. **Overall, the Czech labor market compares relatively well with its neighbors in the region and the EU-15 average.** It is, however, lagging somewhat behind the best performers in the EU—including the UK and the Nordic countries—basically because of low participation rates for the younger and older generations, women and a relatively high and persistent incidence of long term unemployment.

11. **Factors influencing participation and long-term unemployment are complex and often hard to measure.** There are, however, indications that the post-communist era industrial restructuring and associated skill mis-matches in specific regions are among the key reasons for the high rate of long-term unemployment in the Czech Republic<sup>5</sup>, and likely to be more important than overall labor market institutions such as unemployment benefits, minimum wages, and employment protection legislation (IMF, 2004; Juradja and Munich, 2002).<sup>6</sup> The latter factors, on the other hand, might be more pertinent in explaining why participation rates are still somewhat below best international performers.<sup>7</sup> Broader skill mismatches, in particular a rapidly increasing demand for degree-level education, also seem to have played a role (OECD, 2006). Tax and social benefit systems exert important

<sup>5</sup> As noted in IMF (2004), the thrust of the restructuring process happened somewhat later in the Czech Republic—in the late 1990s—than in many of its neighbors.

<sup>6</sup> There is also an ethnic dimension as participation is particularly low among the Roma (IMF, 2004).

<sup>7</sup> The minimum wage, for instance, was raised twice during 2006, bringing it to about 40 percent of the average wage (against 20 percent in the late 1990s).

influences on labor market performance, but as discussed below, are unlikely to cause excessive across the board disincentives to work. Rather, these systems may interact to generate substantial disincentives for limited groups of individuals and families.

### **Income distribution**

12. **The Czech Republic is a highly egalitarian society.** The distribution of income is more compressed and the incidence of poverty lower than in almost any other OECD country—despite a tendency for increasing inequality since the mid-1990s (Burniaux and others, 2006; World Bank, 2007). The recent increases in the minimum wage and the minimum living standards are likely to further bolster this position. Poverty and distributional issues are hence likely to be concentrated on smaller groups, often situated in geographical and ethnic pockets.

13. **The tax and benefit systems are each progressive, implying a highly progressive—and hence redistributive—effect from these two systems in combination** (Schneider, 2004a). Some studies find that the progressivity, in particular the means testing of social benefits, creates significant disincentives to work, or to move up the earnings ladder, at low earning levels—i.e. the presence of both unemployment and poverty traps (Schneider, 20004b). On the other hand, IMF (2006) finds that while the social transfer system in general tends to be effective in reducing inequality in earnings and the risk of poverty, there is still ample scope for expanding the means testing of social transfers and enhancing spending efficiency (a point amplified by the relatively broad coverage of the benefit increases introduced in 2006 and 2007). This points to the key distributional challenge in designing tax and welfare systems, between narrowly targeting benefits and income tax reliefs to those in need (in order to contain government spending) and limiting the disincentives to work or move up the income ladder created by that same targeting.

### **C. The Reform Package—Key Features**

14. **The reform adopted by Parliament in August 2007 and subsequently approved by the Senate and the President is a comprehensive overhaul of the welfare and tax systems.** It intends to strengthen work incentives, partly by compressing real replacement rates, partly by cutting personal income taxes, in particular at the lower and higher end of the earnings scale. The reform implies an overall shift of the tax burden from income to consumption, thus aiming at spurring savings and investment, while also reducing pollution and carbon dioxide emissions through new excises on energy consumption. A reduction of the corporate income tax rate will strengthen the competitiveness of the Czech Republic in terms of attracting investment, and several measures are applied in the health and social area in an attempt to contain spending increases.

15. Key features of the reform package are:<sup>8</sup>

### **Taxation**

Personal income tax: The centerpiece of the tax reform is a 15 percent flat tax on personal income. Since the tax will be levied on gross earnings plus the employer's social security contributions, the effective flat rate is 23 percent. Like the recent wave of flat tax reforms in Central- and Eastern Europe, this is not a classical flat expenditure tax with one marginal rate (Hall and Rabushka, 1985), but a one-rate tax on personal income (Box 1).<sup>9</sup> In practice, however, there will still be multiple marginal effective tax rates due to the tax credits, the social security contributions and the means-tested social benefits. The reform involves a substantial scaling up of various tax credits, and, importantly, abolition of the recently introduced joint taxation for couples with children. The final withholding tax on dividends and interest income will be aligned at 15 percent, and the tax free status of mortgage-backed bonds eliminated. Personal capital gains on financial and real assets will continue to be tax exempt after 6 months' ownership.

Social security contributions: There will be a cap on social security contributions for wage earners, kicking in at 4 times the average wage (about CZK 1,000,000 annually). The already existing cap for the self-employed will be raised to the same level.

The corporate income tax will be lowered gradually from 24 percent to 19 percent in 2010. There will be some modest expansion of the tax base.

The lower VAT rate, currently at 5 percent, will be raised to 9 percent. The standard 19 percent rate will be maintained.

---

<sup>8</sup> See Appendix 1 for more detail.

<sup>9</sup> It is envisaged that the flat rate will be reduced to 12.5 percent in 2009, but these plans – and their possible financing - are uncertain and hence not considered in the following.

### **Box 1. Experience with Flat Tax Reforms in Central and Eastern Europe**

Flat taxes on personal income have been introduced in nine countries in Central and Eastern Europe (year of introduction):

- Estonia: 26 percent (1994)
- Lithuania: 33 percent (1994)
- Latvia: 25 percent (1995)
- Russia: 13 percent (2001)
- Serbia: 14 percent (2003)
- Slovakia: 19 percent (2004)
- Ukraine: 13 percent (2004)
- Georgia: 12 percent (2005)
- Romania: 16 percent (2005)

Some of these countries—Estonia, Slovakia, Romania and Serbia—have a flat CIT rate at the same level as the PIT rate.

While there are substantial differences in design, a common feature is that the shift to flat taxes in these countries have generally been associated with tax cuts at the bottom and the top of the income distribution, while taxation of middle income levels have either been unchanged (implying lower overall revenue) or increased (to achieve revenue neutrality). The effects of these reforms in terms of efficiency and simplicity are ambiguous, especially where combined with base narrowing measures, and there are generally no sign of Laffer type behavioral responses (generating revenue increases from cutting taxes). Moreover, most of these countries continue to rely heavily on social security contributions and means-tested social benefits, which in turn imply continued multiple, and for some earnings ranges significant, marginal effective income tax rates. Distributional effects of the flat taxes are not unambiguously regressive, and in some cases may have increased progressivity, including through the impact on compliance (Keen and others, 2006).

The Czech reform proposal have significant similarities with the successful 2004 reform in Slovakia, although with important exceptions – for instance, Slovakia merged the two VAT rates into one single rate, implemented a wide ranging pension reform, cut social assistance programs more substantially and closed a number of corporate loopholes (for a discussion of Slovakia's reform, see Brook and Leibfritz (2005) and Moore (2005)).

## **Spending**

Benefits: All social benefits, except for pensions, will cease to be automatically indexed to cost of living measures. The unemployment benefit will be tightened, some benefits are eliminated and others streamlined. The regular child benefit will no longer be graduated according to income level (but will be discontinued above an income threshold which is substantially lowered) and the additional child benefit will be phased out earlier. For analytical purposes, this paper also includes as part of the new regime the change to the

accommodation allowance that was enacted from January 2007. This change has important implications for marginal and average effective tax rates at low income levels, as discussed below.

Health: To curb expenses for sickness, financing of sickness benefits will, to a larger extent, be borne by employers and no benefits will be paid for the first three days of sickness. Limited co-payments—in the order of 1 to 3 euros—are introduced for medical services (doctor's visits; short-term hospital stays; emergency services; prescriptions).

Pension: The reform leaves out the important question of reform to the pension system, except for proposing a further general increase in the retirement age to 65 (an increase to 63 years for men is already being phased in towards 2013) and extending the qualifying period from 25 to 35 years of work. A more comprehensive overhaul of the pension system, based on the recommendations of a 2005 expert group and each of the political parties, is expected within the next couple of years (See Hemmings and Whitehouse (2006) for a thorough review of the five proposals currently on the table).

#### **D. Analysis and Assessment of the Reform Package**

##### **Personal income tax**

16. **The reform package will result in rather substantive tax cuts for many income earners.** Effects on labor market participation and unemployment depends on the path of average effective tax rates (influencing mainly the decision to participate in the labor market) and marginal effective tax rates (influencing mainly the decision to work more hours).<sup>10</sup>

17. **To grasp the importance of changes to the benefit system implemented from 2007, the analysis below focuses on changes over the years 2006 to 2008.**<sup>11</sup> The main features driving those changes are summarized in table 1.

---

<sup>10</sup> Throughout this paper we follow the standard methodology of analyzing effective tax rates, i.e. including personal income tax, social security contributions and the effects from generally available benefits such as the child benefits and the accommodation allowance (see for instance OECD, Taxing Wages 2005/06). The norm cost for rented apartments outside of Prague is assumed to reflect actual housing costs. The norm cost is assumed to increase by about 20 percent from 2007 to 2008 (estimates of the Ministry of Social Affairs).

<sup>11</sup> In particular, there was a substantial scaling up of the accommodation allowance effective January 1, 2007, where the allowance was changed from an minimum housing costs principle to one based on actual costs (subject to a limit). The change was triggered by the elimination of rent controls from the same date and other administrative increases in the cost of housing. Other new benefits were also introduced in 2007, such as the new system for minimum living standard transfers and additional accommodation allowances.

**Table 1. Key Selected Changes in Tax and Benefit Systems, 2006–08**

	2006	2007	2008
Tax rates, percent	12; 19; 25; 32	12; 19; 25; 32	15
Minimum Living Standard	Incl. accommodation	Excl. accommodation	Excl. accommodation
Regular child benefit, threshold	1.1; 1.8; and 3.0 times MLS	1.5; 2.4; and 4.0 times MLS	2.4 times MLS
Additional child benefits, threshold	1.6 times MLS	2.2 times MLS	2.0 times MLS
Separate accommodation allowance	Moderate	Expanded	Expanded
Cap on social security contributions	No	No	Yes
Tax credits	Moderate	Moderate	Expanded
Joint taxation	Yes	Yes	No

Note: the highlights indicate where rules are broadly unchanged between two years.

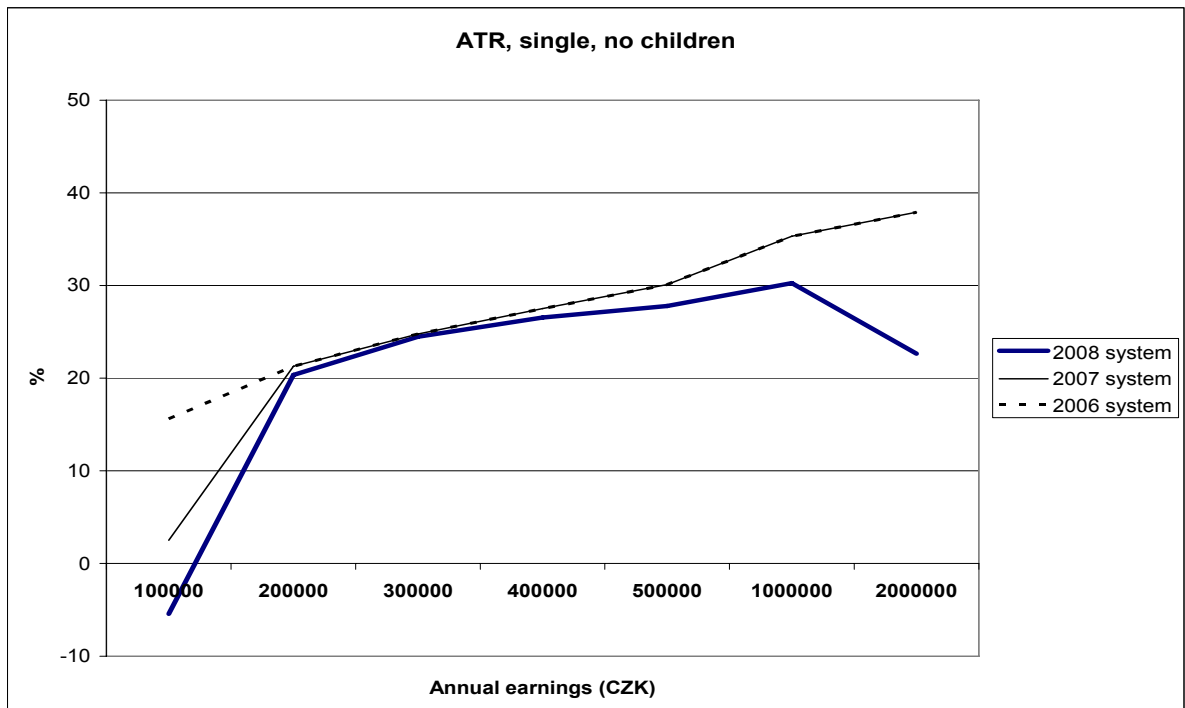
18. **Between 2006 and 2008, the average effective tax rate (ATR) is reduced substantially at the bottom and the top of the earnings scale**, reflecting primarily the expanded tax credits (from 2008) and the significantly enhanced accommodation allowance and minimum living standard transfers (from 2007) for the former and the lower marginal tax rate and the cap on social security contributions for the latter. The small reduction in the regular child benefits from 2007 to 2008 is thus more than offset by larger tax credits for working, low income groups, and higher social transfers.<sup>12</sup> Mid-range groups (CZK 250,000-500,000) are much less affected by the reform since the base increase to “super gross,” i.e. including social security contributions, basically outweighs the lower marginal tax rate (Figure 7). There will be small tax increases for some mid-income families, where the loss of the option for joint taxation and the earlier phase out of child benefits dominate the effect of lower marginal tax rates and the higher basic and child tax credits. **The tax cuts for high earning individuals imply that the overall tax system ceases to be progressive from 2008, since the average effective tax rate actually falls for earning levels above CZK one million.**

19. **The story is less clear-cut on marginal effective rates (MTR).** At the bottom of the wage distribution, the marginal tax rate has increased from 12 to 15 percent. For the very lowest wages, this is offset by the increased basic tax credit which keeps more people

<sup>12</sup> The scaling up of tax credits also influences the various social transfers through the effect on the take home pay and hence the means testing. An exception is the non-wastable child tax credit, which is excluded from the income measure used for means testing.

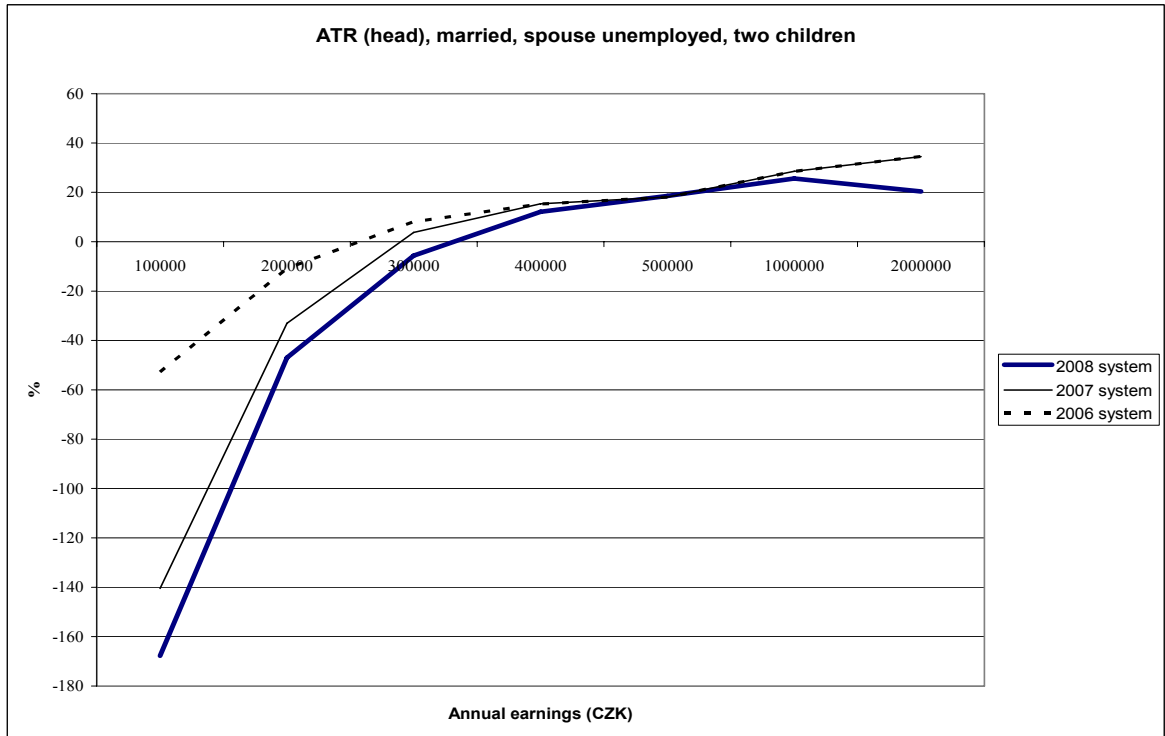
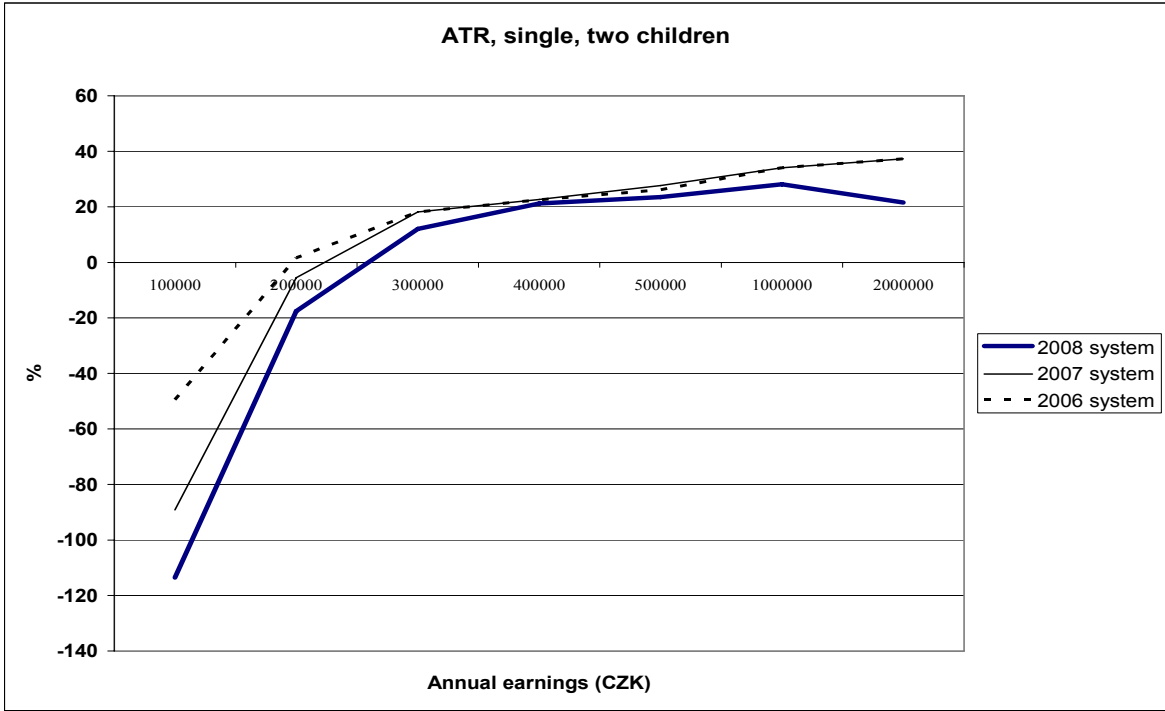
entirely out of the tax net.<sup>13</sup> However, the benefit withdrawals keep marginal effective tax rates in 2008 higher for most low- to mid-income earners than they were in 2006 (Figure 8). In particular, the high MTR's—70 to 80 percent—kicking in at or just above the minimum wage (in the CZK 100,000-300,000 earnings range) act as a barrier to labor supply among single wage earners with children as well as low income families. Further up the wage distribution the MTR's drop as the effect of the flat 15 percent rate compared with the existing progressive scale kicks in. The very high incomes (those earning wages above four times the average, or about CZK one million per year) receive a substantial reduction in the MTR (from 40 to 15 percent) as the social security contribution is capped nominally beyond that wage level.

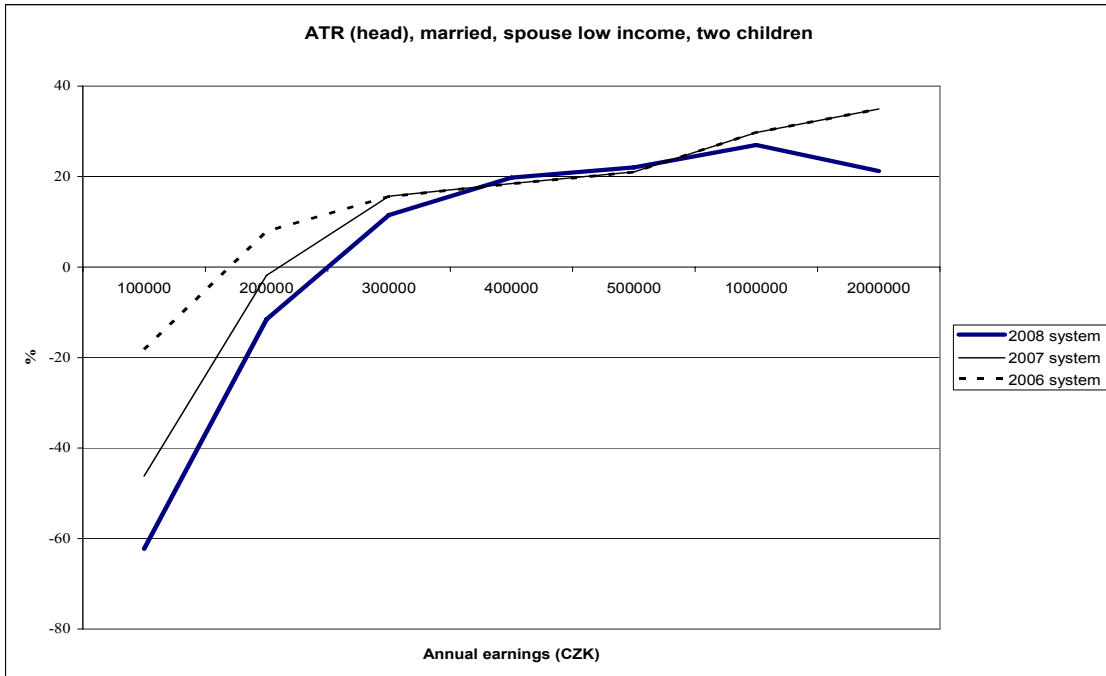
**Figure 7. Average Effective Tax Rates**



<sup>13</sup> In the current system, the income tax would be positive for earnings exceeding CZK 60,000 per year (for a single wage earner without children). In the new system, the “no-tax” threshold is raised to about CZK 120,000.

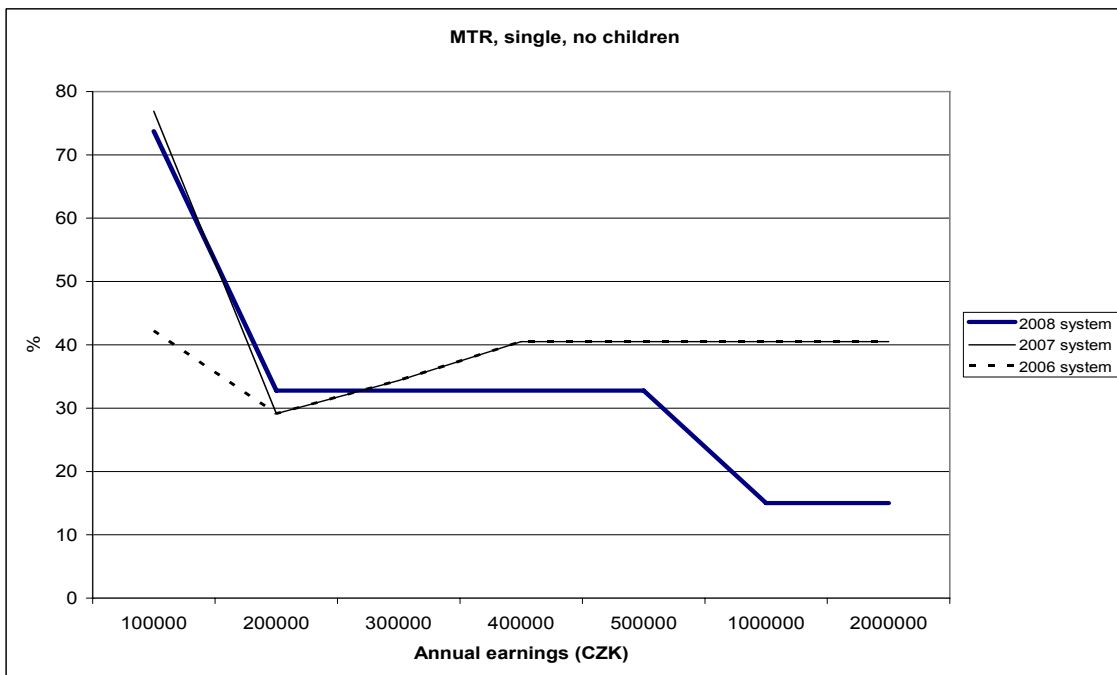


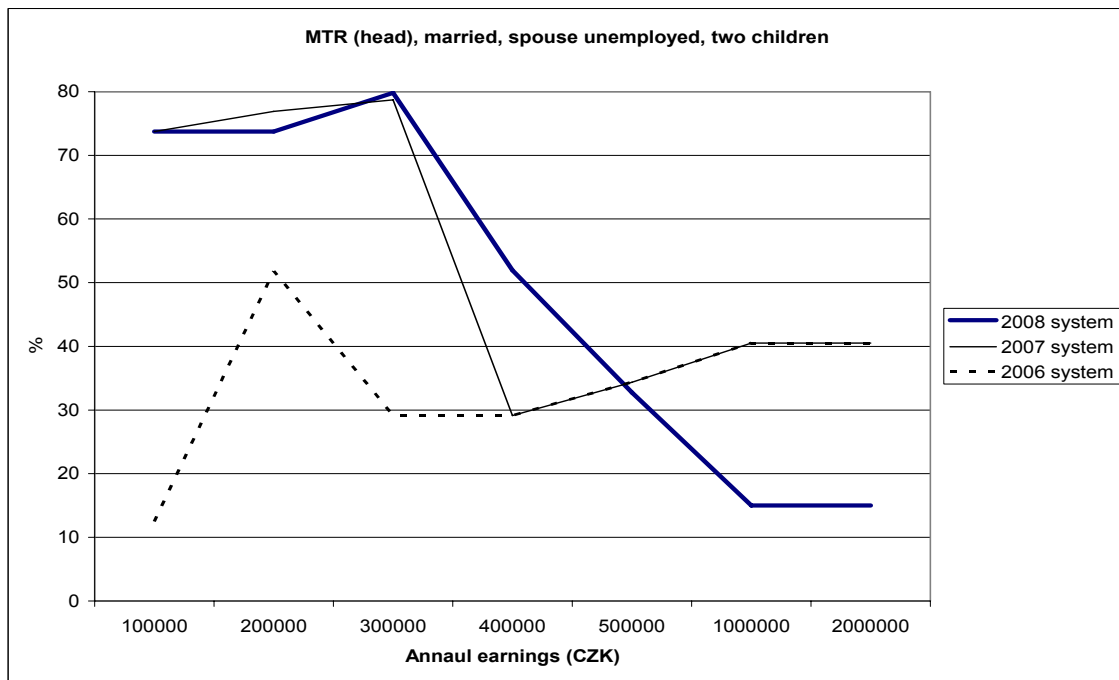
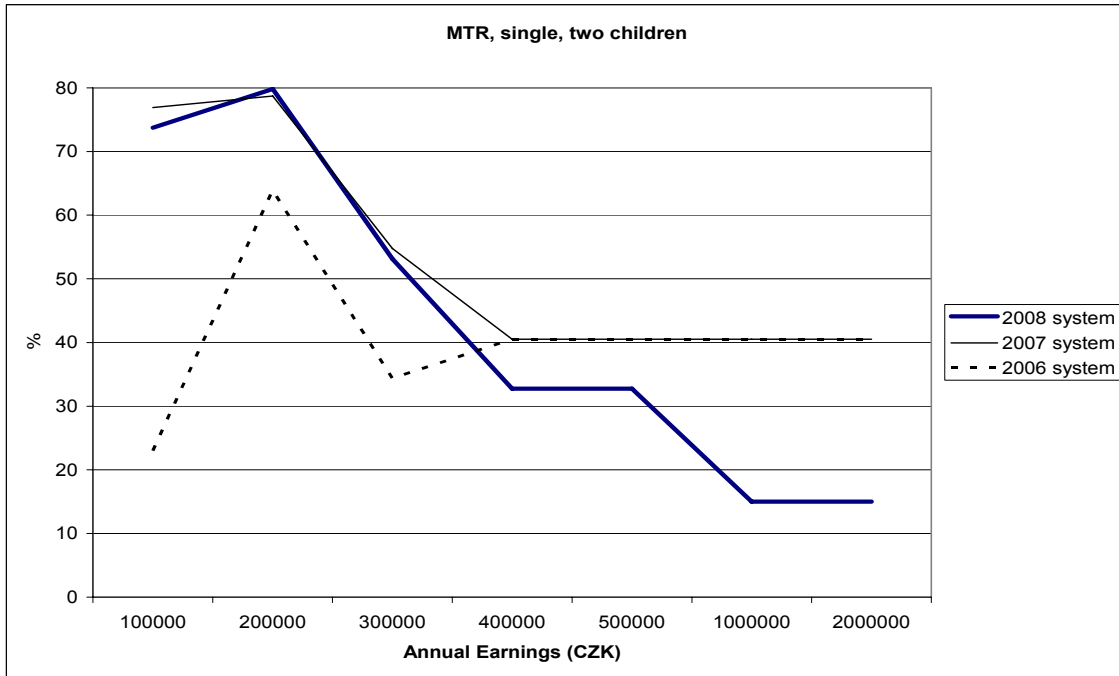


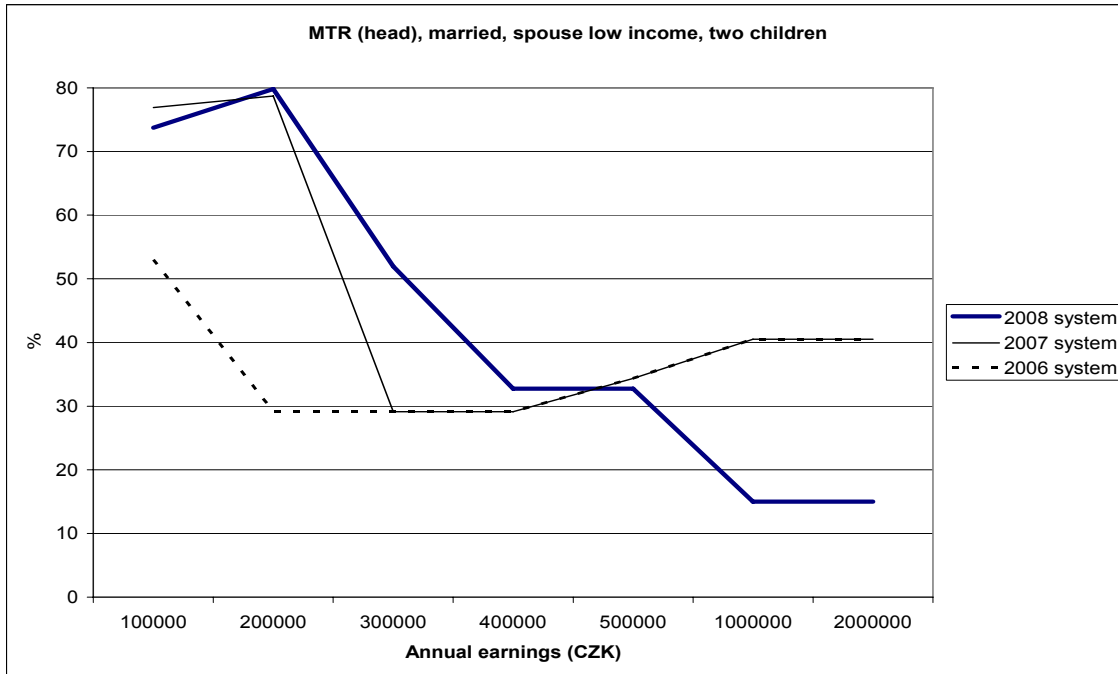


Source: Staff calculations.

**Figure 8. Marginal Effective Tax Rates**



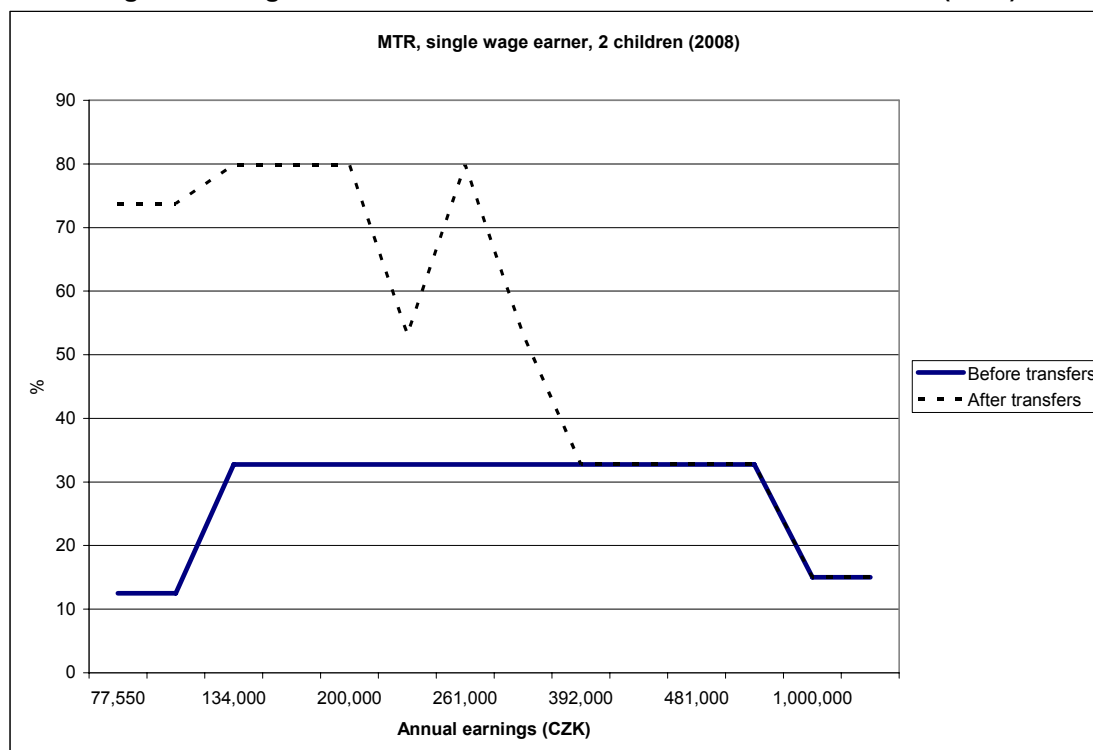




Source: Staff calculations.

20. **The problem of interaction of the tax and benefit systems in creating high effective marginal tax rates can be illustrated by the example of a single wage earner with two children.** At low earnings, her marginal tax rate (before benefits) would be 12½ percent (i.e. her own social security contribution), rising to 33 percent a bit further up the wage scale. But, when taking into account the phasing out of child benefits and the accommodation allowance, the effective marginal tax rate is much higher—up to 80 percent at low earnings (Figure 9).<sup>14</sup> The new regime for the regular child benefit, with just one cut-off income level, is an improvement over the old system, where the benefit was reduced at three different points on the income scale, creating large spikes in the marginal effective tax rates at each point. Evidently, such spikes, in turn, imply strong disincentives for efforts to increase earnings (since around these income levels, it takes a substantial increase in gross earning to keep take home pay from falling).

<sup>14</sup> The accommodation allowance alone adds about 26 percentage points to the effective marginal tax rate at low incomes (31 percentage points in Prague) and the additional child benefit typically 20-40 percentage points (depending on the number of adults and children in the family).

**Figure 9. Marginal Effective Tax Rates Before and After Transfers (2008)**

Source: Staff calculations. Note. The spike at around CZK 260,000 is caused by the cut-off of the regular child benefit.

21. **Considering marginal effective tax rates alone, however, might not give the full picture for assessing labor market incentives, since they—by definition—consider only a marginal increase in earnings.** What is often more relevant, especially at the bottom of the earnings scale, is the increase in take home pay when going from very low earnings to a level that is, say, CZK 100,000 higher (for instance, shifting from a part time job to a full time job; attaining further education to gain a higher salary; moving city for a better paid job).

22. **It turns out that the 2008 regime for many groups implies higher tax takes on additional earnings when moving up the income ladder from low- and mid-income earnings (Table 2).**<sup>15</sup> Conversely, at the higher end of the income scale, the tax take on additional income will be smaller than before, thus spurring work incentives.

<sup>15</sup> For instance, a single mother with two children going from the minimum wage of about CZK 100,000 to an annual wage of CZK 200,000, will, in 2008, receive only about CZK 22,000 in additional take home pay—the rest, CZK 78,000, is taken away as taxes and, in particular, reduced benefits. In the 2006 system, she would keep about CZK 47,000 of the increased gross earnings as take home pay and leave about CZK 53,000 in taxes and reduced benefits.

**Table 2. Composite Marginal Tax Take: How Much is Taxed Away When Earnings Increase by CZK 100,000 Annually (percent)**

Initial level of gross earnings	Single, no children		Single, 2 children		Spouse unemployed		Spouse low income	
	2006	2008	2006	2008	2006	2008	2006	2008
100,000	27	28	53	78	31	74	54	78
200,000	32	33	54	71	46	77	37	75
300,000	36	33	36	49	37	66	29	51
400,000	41	33	41	33	29	44	33	33

Source: Staff calculations.

23. **Another key measure for work efforts at the bottom of the earnings scale is the gain in take home pay from moving from unemployment benefits or social transfer income into earnings from work.** The 2008 regime generally implies a larger reward from work (compared with the old regime) when moving into low paid jobs and a smaller reward when going into average paid jobs (Table 3).<sup>16</sup>

24. **The 2008 system is thus, in general, better at encouraging participation at low wages, while it is worse at encouraging participation at average wages** (which in turn could dampen incentives for the unemployed to undertake further education or training, or to apply for better paid jobs in other regions). And, although participation incentives have improved for some groups, the overall impression is that the tax and benefit systems still combine to create rather high effective tax rates and thus significant unemployment traps.

**Table 3. Composite Tax take When Moving from Unemployment or Social Transfer to Employment (percent)**

Implied tax rate (% gross earnings)	Single, no children		Single, 2 children		Spouse, inactive		Spouse low income	
	2006	2008	2006	2008	2006	2008	2006	2008
From UI (APW) to APW	65	67	75	74	64	67	68	80
From UI (MW) to APW	47	56	63	70	64	66	55	76
From UI (APW) to MW	115	109	100	72	99	50	103	86
From UI (MW) to MW	70	83	70	60	99	46	70	76
From social transfers to APW	46	46	63	61	64	57	42	67
From social transfers to MW	67	58	70	38	99	24	37	54

Source: Staff calculations.

25. **In sum, labor supply effects from the reforms in 2007/08 are ambiguous as there are offsetting substitution and income effects, depending on earnings level.** At the lower end of the earnings scale there is a combination of lower aggregate and higher marginal tax rates, both of which tend to discourage work effort (such as working more hours, seeking better paid jobs, or undertaking education). Although the enhanced tax credits helps to

<sup>16</sup> A primary earner with an unemployed spouse, for instance, will see a reduction in the effective tax take from 99 to 50 percent if moving from unemployment benefits (based on a previous job at the average wage) to a minimum wage job. If, instead, she moved into an average wage job, the effective tax take would increase from 64 to 67 percent.

increase the income gains from employment (over unemployment benefits or social transfers, which are not taxable income), thus spurring entry into low paid jobs, **the high effective marginal rates at low earnings—caused primarily by the withdrawal of the additional child benefit, the accommodation benefit and the minimum living standard transfer - are highly detrimental to further work effort.** Moreover, the tax credits are not targeted, making them less cost-effective measures for encouraging participation.

26. **At mid-income levels, tax changes are rather small, but tend to combine higher average rates and lower marginal rates, both of which increase labor supply (as the income and substitution effects works in the same direction).** The high-wage earners face substantially lower average and marginal rates and their labor response is hence ambiguous (lower ATR's reduce supply while lower MTR's increase it). Since these groups already tend to work long hours, however, it is likely that the income effect will dominate, hence reducing supply. One exception is that there will be less salary driven emigration (and "brain drain") among high income earners and it would be easier to attract high skilled foreign labor. However, migration decisions do not exclusively depend on net income prospects and those prospects, in turn, do not depend exclusively on taxation.<sup>17</sup>

27. **For spouses, there will be enhanced incentives to participate through the abolition of joint taxation and the higher personal tax credit.**<sup>18</sup> This is, however, to a considerable extent offset by the significant increase in the spouse tax credit, which—through the income effect—discourage participation. From a labor supply viewpoint, this is unfortunate since the supply of labor of the second earner in the household is normally much more sensitive to tax changes than the labor supply of the primary earner.

28. **For the older generations on the labor market, the new tax credit for retirees who continue to work would substantially strengthen incentives to work.** Given the relatively low effective retirement age (IMF, 2006), the deadweight loss associated with the credit is likely to be limited. It needs to be ensured, though, that the full credit is limited to those working full time. One drawback of the credit is that it exacerbates, by giving a tax credit to the elderly, generational inequalities already found to be rather substantial in the Czech Republic (IMF, 2005).

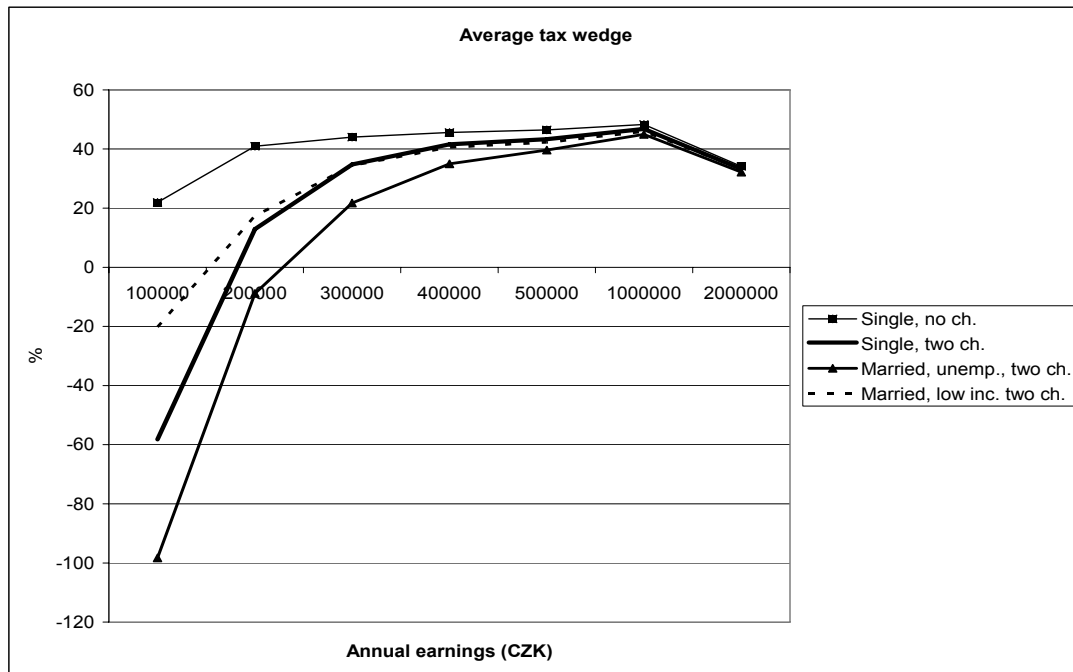
---

<sup>17</sup> Recent data on migrant flows shows that emigration is far less of an issue for the Czech Republic than in Poland, Slovakia or the Baltic countries (Tirpak, 2007).

<sup>18</sup> Joint taxation is normally found to enhance the labor supply – hours --of the primary earner (through lower marginal tax rates in a progressive system), while discouraging the labor supply of the second earner through both higher marginal rate than if he/she was taxed individually and lower average tax rates for the household (see for instance Caliendo and others (2007) for a study of the effects of joint taxation in Germany).

29. On the labor demand side, the proposed tax rates will reduce tax wedges at the bottom and the top of the earnings scale, along the lines observed for the average effective tax rates. One noteworthy feature of the proposal is that tax wedges for married couples with children (unemployed spouse) are substantially lower than those facing single wage earners with children, because of the large spouse credit for the former (Figure 10). This is not a new feature of the tax and benefit system, but one that might be worthwhile re-considering since there is little economic reason for upholding the inequality between couples and singles. And, as discussed above, the spouse credit acts as a substantial barrier for labor participation for spouses.

Figure 10. Average Tax Wedges (2008)



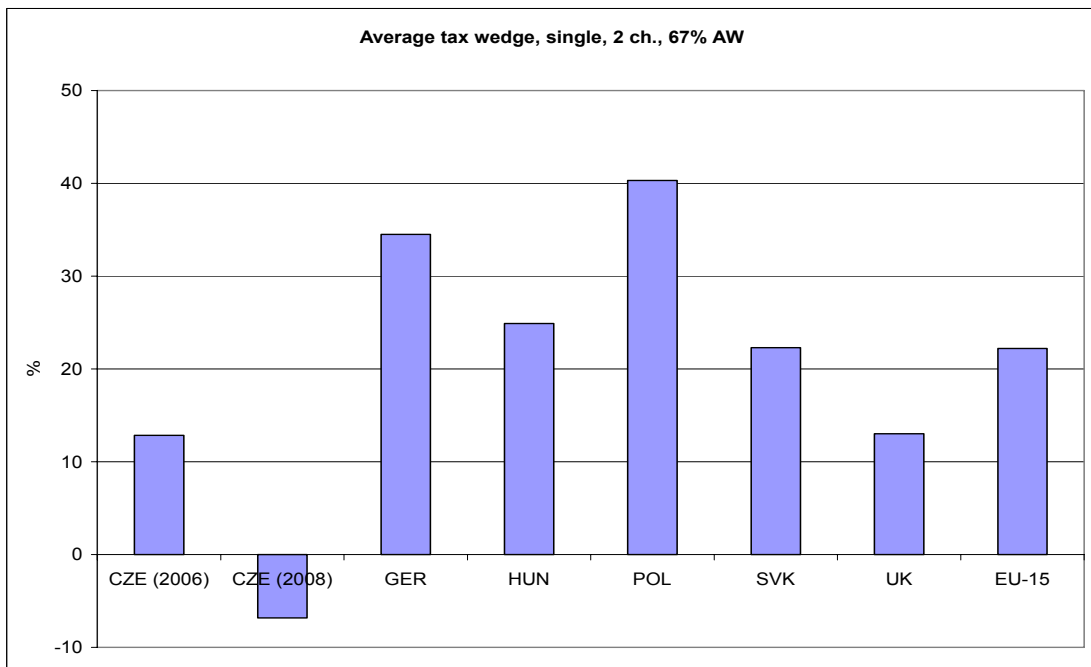
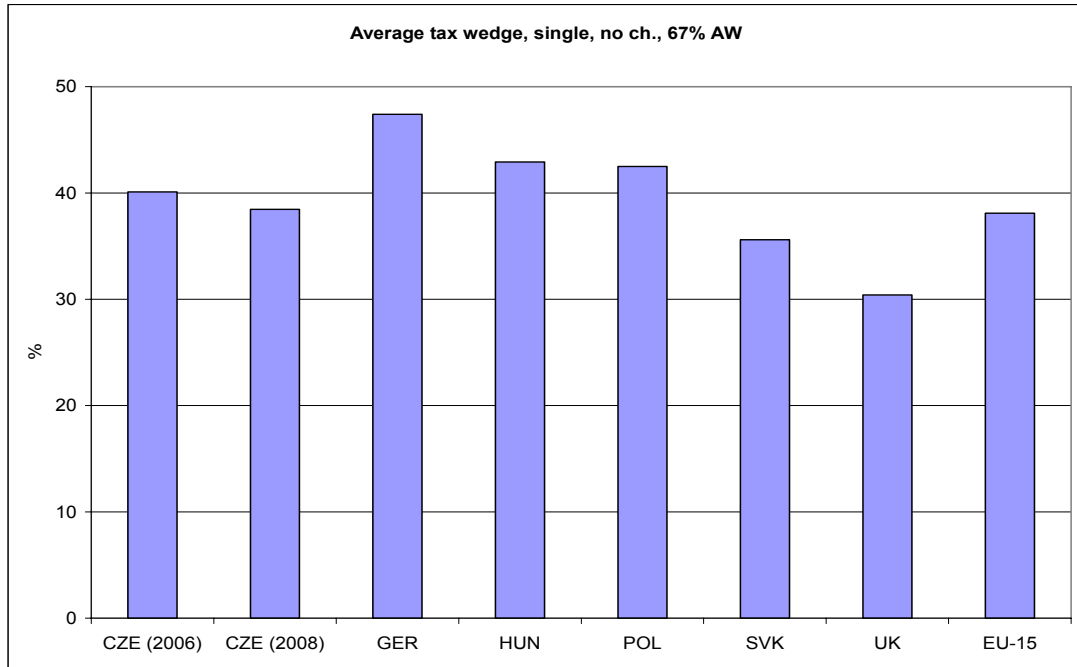
Source: Staff calculations.

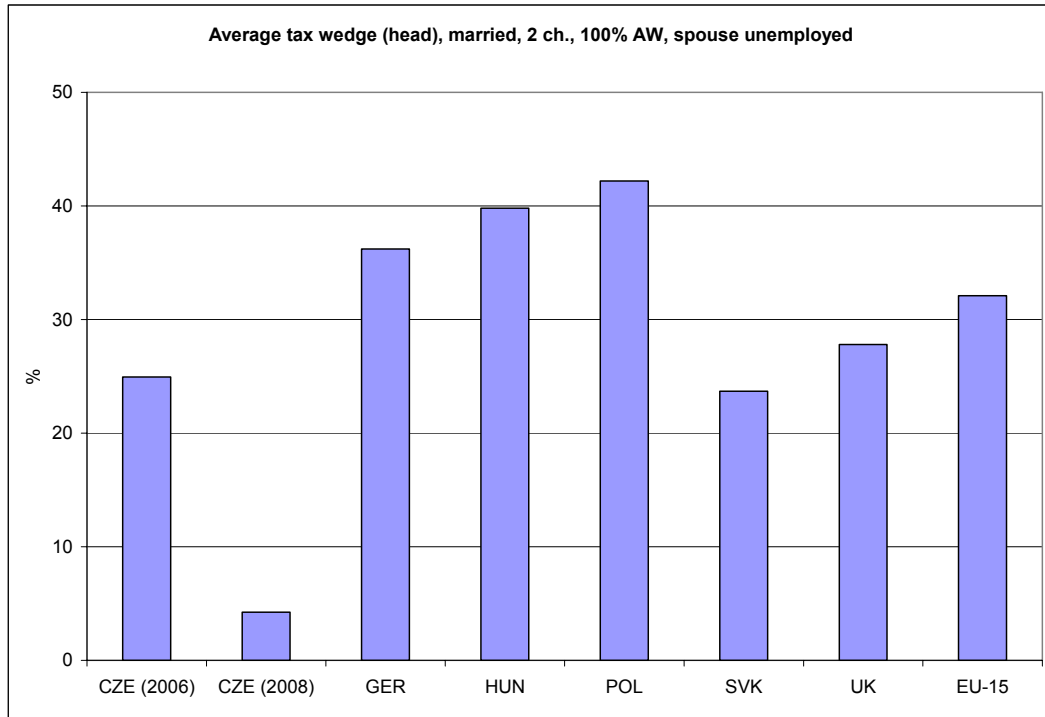
### *The international context*

30. Tax wedges in the current system are already at the lower end of the EU-15 and regional spectrum, especially for families (Figure 11). Hence, there is no indication that the tax system act as a stronger brake on labor demand in the Czech Republic than in other EU countries or among its neighbors. After the reform, this feature will be even more pronounced.



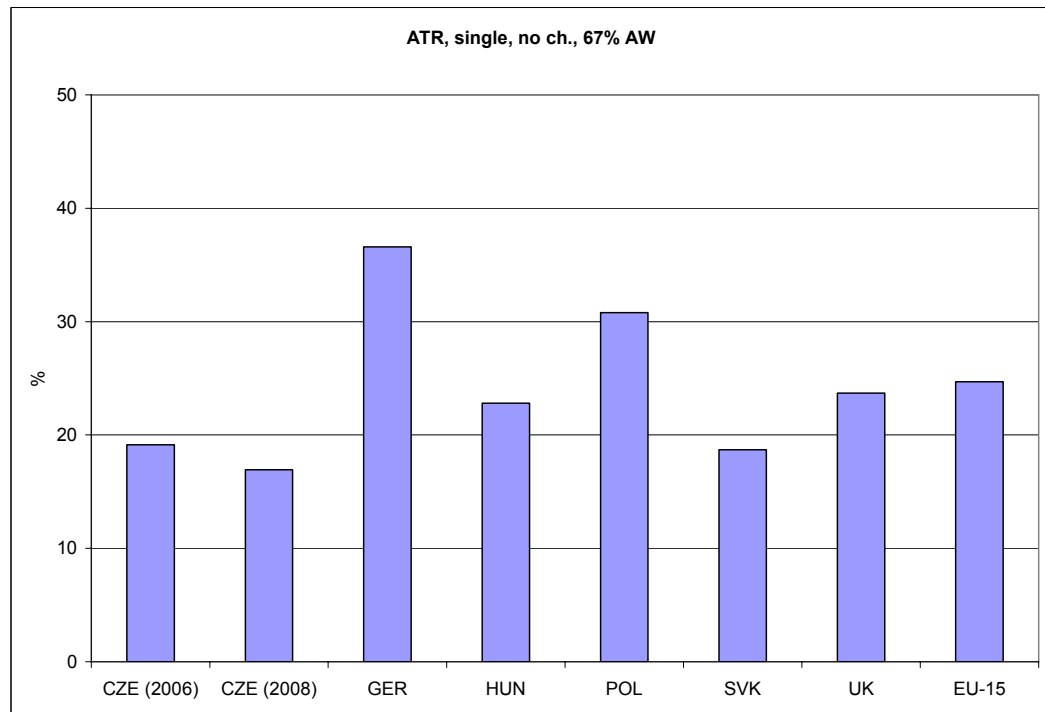
**Figure 11. Average Tax Wedges in Selected Countries**

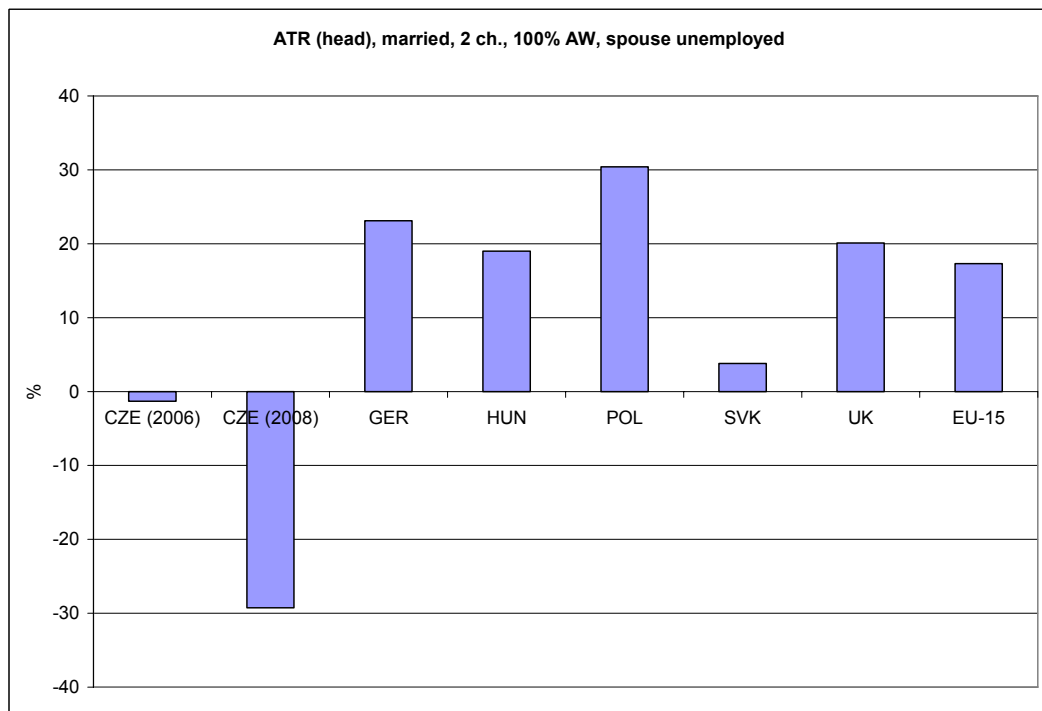
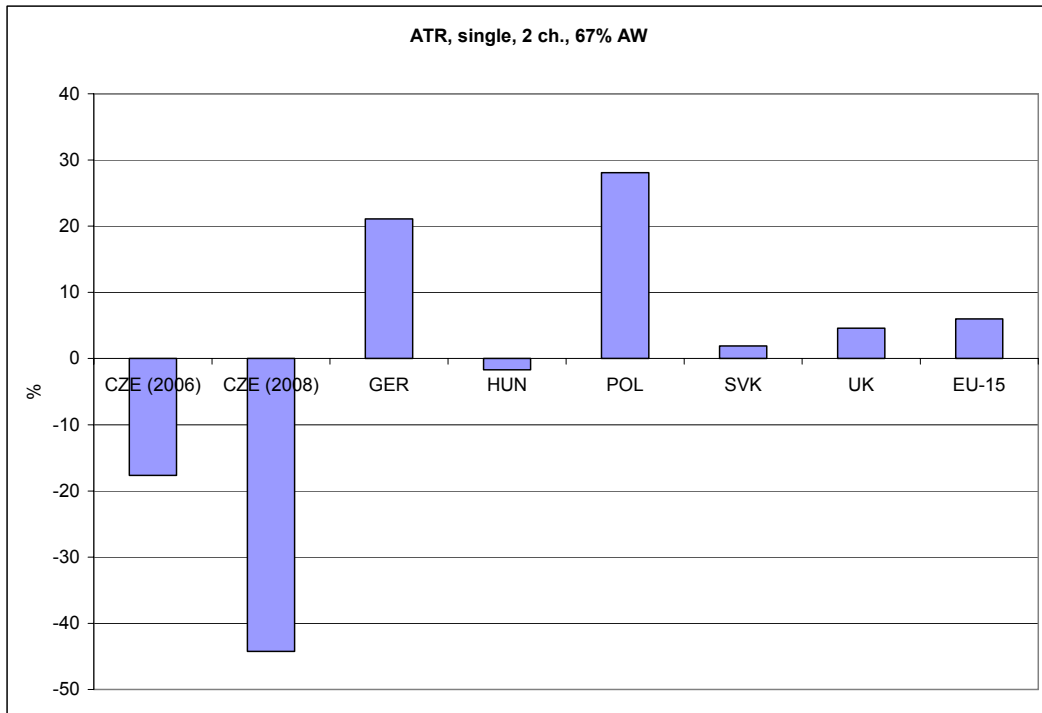




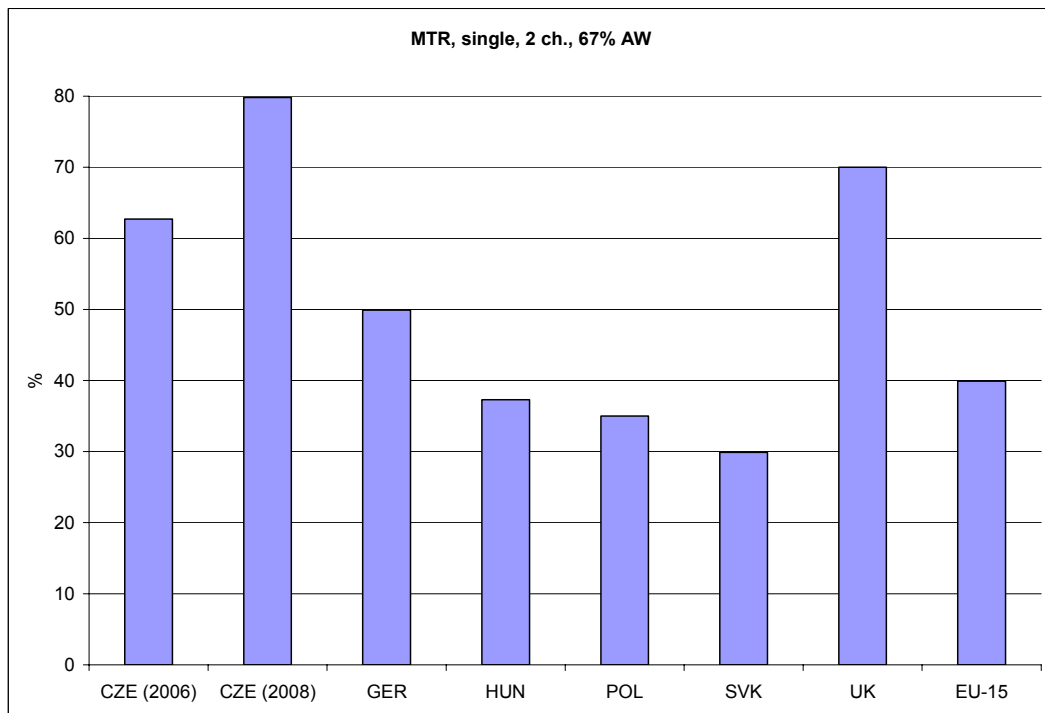
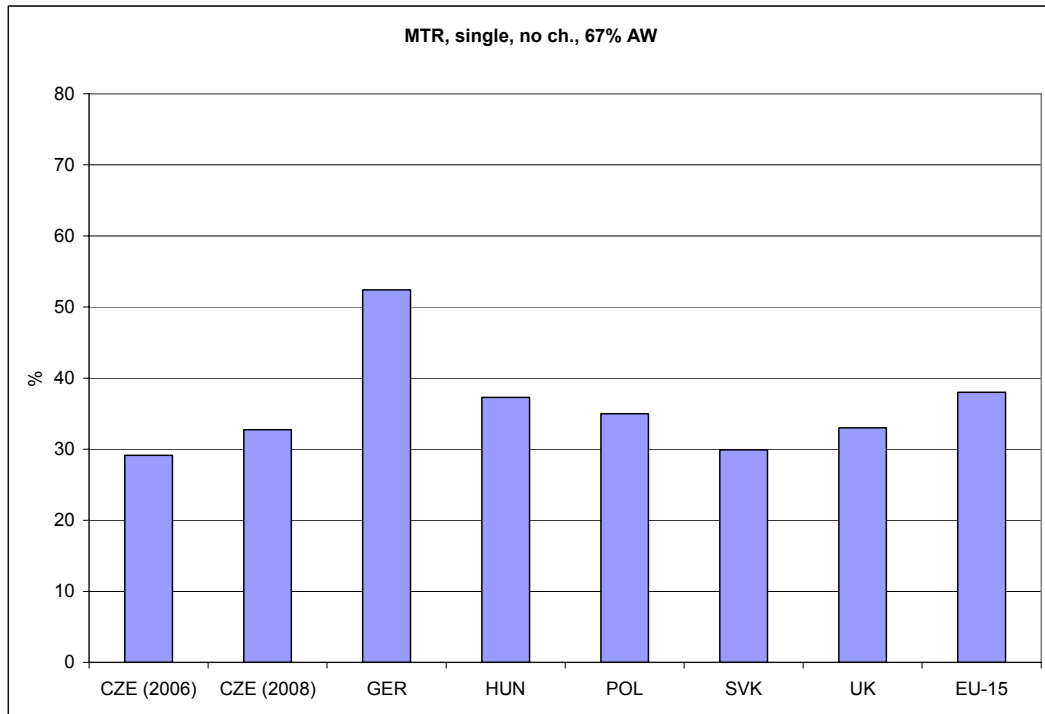
Source: OECD (2007) and staff calculations. Note. The average effective tax wedge measures total tax, social security contributions and benefits as a percent of gross labor costs (including employers social security contribution).

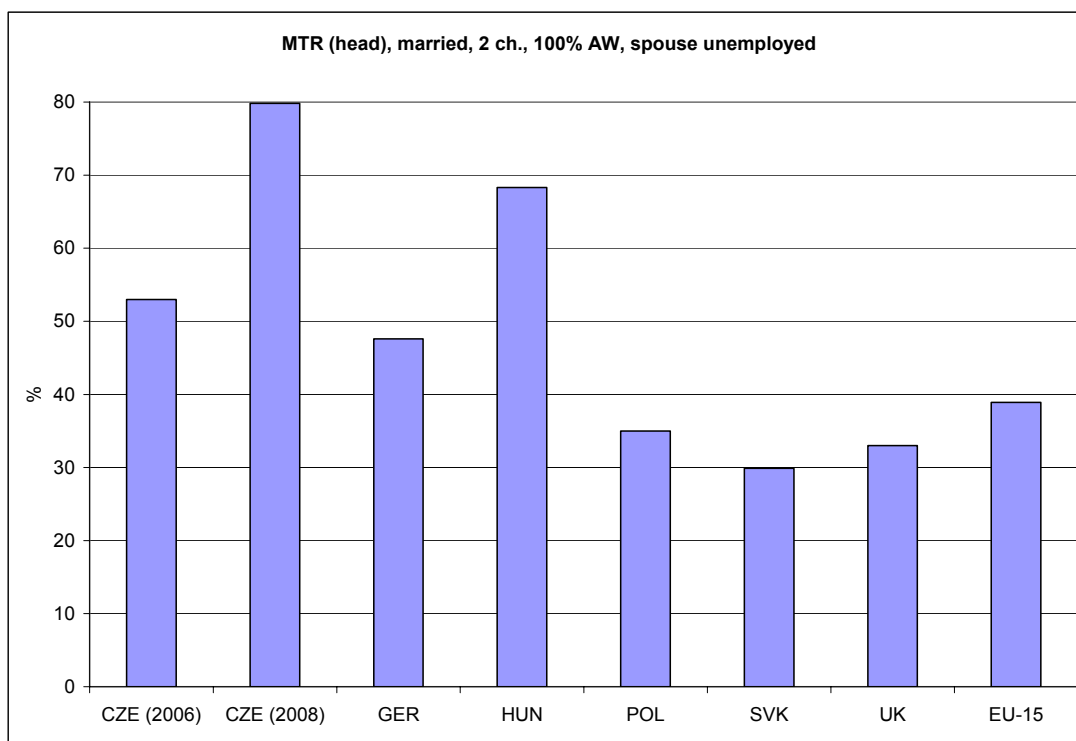
**Figure 12. Average Effective Tax Rates in Selected Countries**





Source: OECD (2007) and staff calculations. Note. The ATR measures total tax, employee social security contributions and benefits as a percent of gross earnings.

**Figure 13. Marginal Effective Tax Rates in Selected Countries**

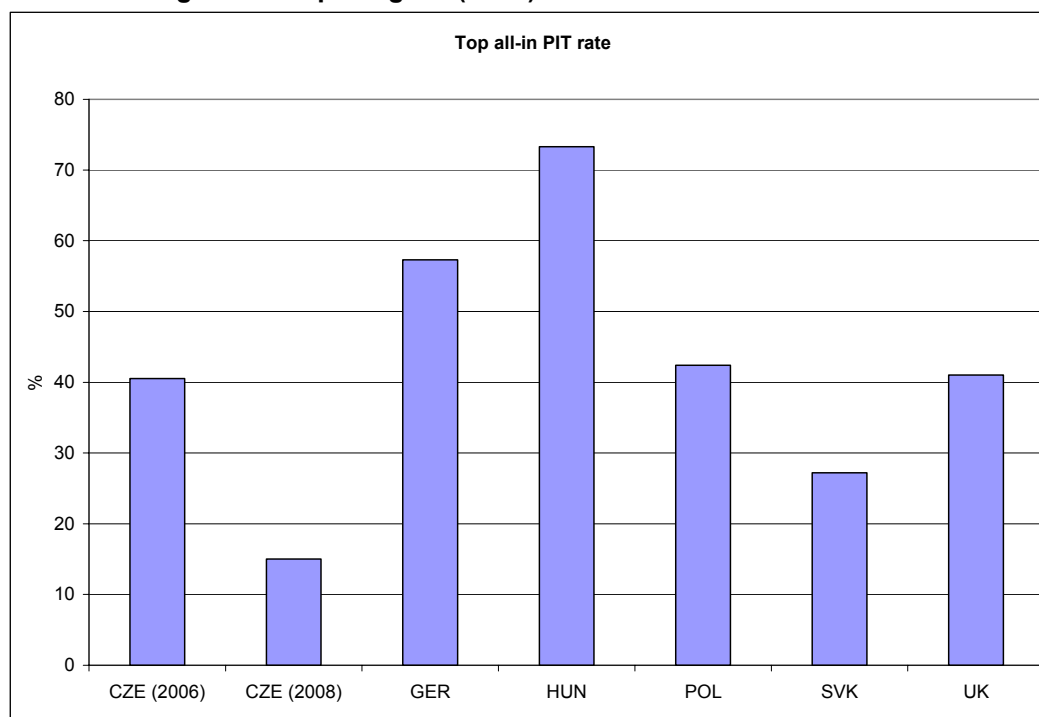


Source: OECD (2007) and staff calculations. Note. The MTR measures marginal tax, employee social security contributions and benefits as a percent of marginal gross earnings.

31. **Average effective tax rates are also lower than in most other EU countries and the reform exacerbates this feature (Figure 12).** Low income families pay negative income taxes/receives a tax subsidy—in contrast to most other countries, except for some of those applying earned income tax credits (such as the United States and New Zealand)—thanks to the generous tax credits and the various benefits.

32. **Marginal effective tax rates are relatively low when excluding benefits and relatively high when including benefits (Figure 13).** Marginal tax rates will increase for some family types under the new regime, especially in the low- to mid-income range, where rates will continue to significantly exceed EU-15 and regional standards. **The top marginal rate, on the other hand, will now be reduced from 40 to 15 percent and hence become, by far, the lowest in the EU and indeed the OECD (Figure 14).**

Figure 14. Top Marginal (all-in) Tax Rate on Personal Income

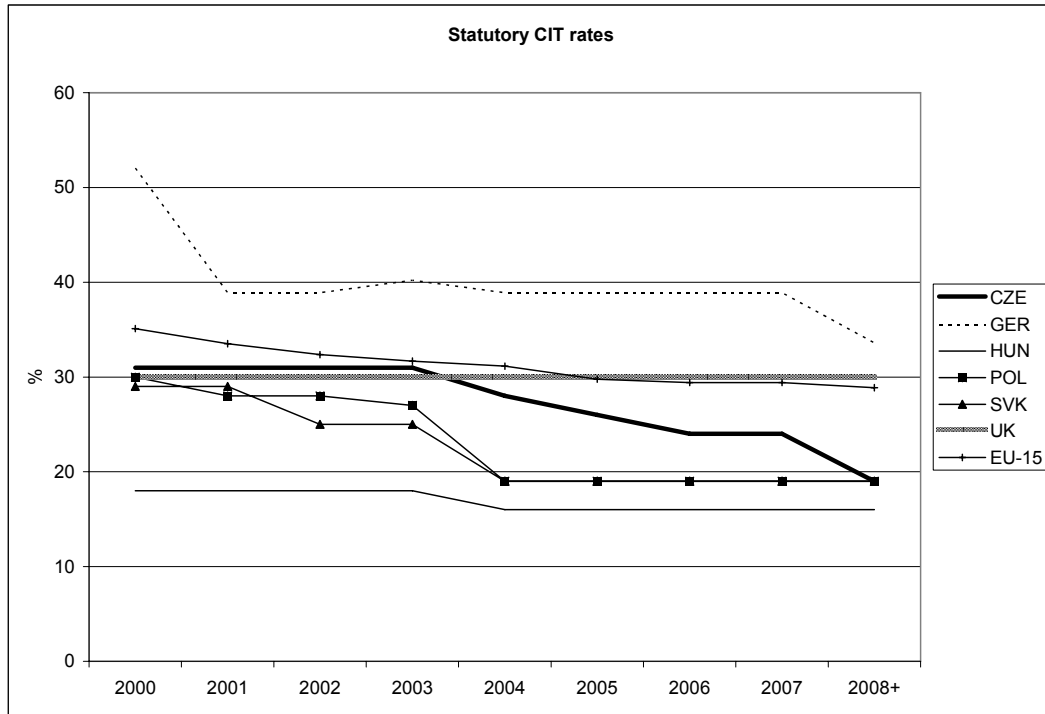


Source: The OECD tax database.

### The corporate income tax

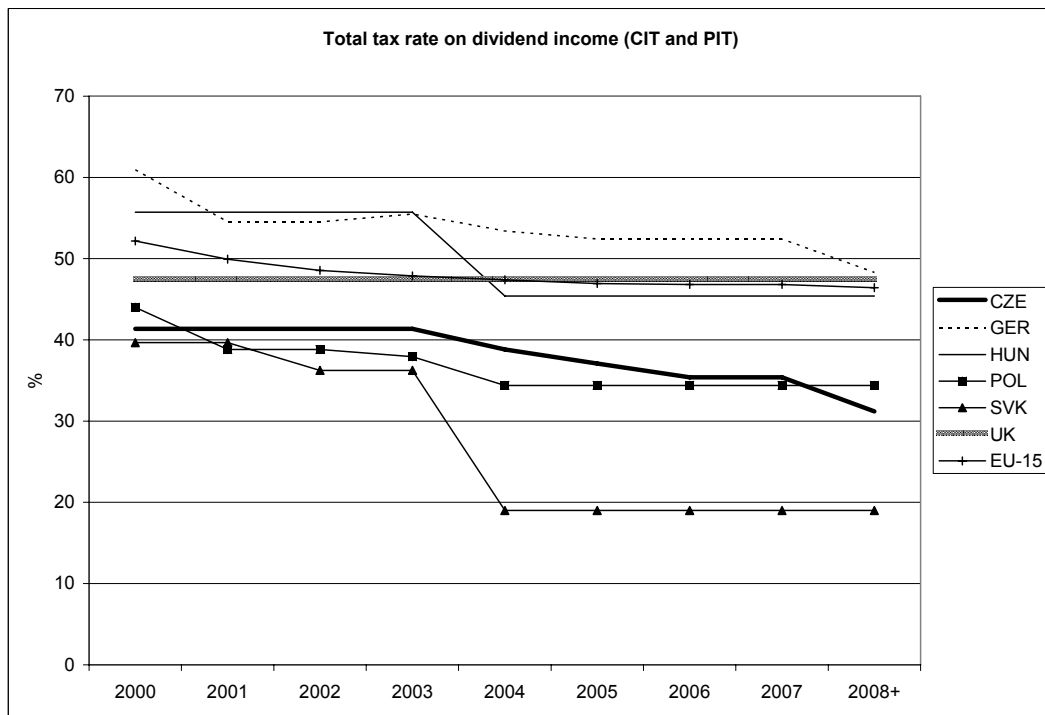
33. **The proposal to cut the corporate income tax rate comes after a series of rate cuts in recent years, not only in the Czech Republic, but across the EU and most other parts of the world.** The current rate in the Czech republic, at 24 percent, is somewhat below the EU-15 average and the rates in countries like Germany and the United Kingdom, but above rates found in some other countries in the region, including Hungary, Poland and Slovakia (Figure 15). However, looking at the wider taxation of dividend income (CIT and PIT combined), the Czech Republic is faring better compared with the EU-15 average and its regional competitors, with a combined rate currently at 35 percent, the same level as Poland (Figure 16). Among EU-25 countries, only Slovakia and Greece have lower combined rates.

**Figure 15. Statutory Corporate Income Tax Rates in Selected Countries**



Source: The OECD tax database.

**Figure 16. All-in Rates on Dividend Income in Selected Countries**



Source.: The OECD tax database.

34. **The corporate income tax base seems to be less eroded by tax preferences and incentives than many other EU and OECD countries.** Although a relatively generous investment tax credit is offered for new investment (subject to conditions of scale, sector, location etc.) and significant tax incentives apply to spending on research and development, the base appears to be relatively broad and depreciation rules overall broadly in line with other countries in the EU.<sup>19</sup>

35. **A rough indication of the broadness of the corporate income tax base is the so-called CIT effectiveness indicator, which measures how much corporate income tax revenue is raised (in percent of GDP) per percentage point tax rate.** The CIT effectiveness in the Czech republic, at almost 0.2<sup>20</sup>, is about twice the size of the average found in large industrial countries and also substantially higher than those of neighboring countries. The relatively broad base combined with a CIT rate close to the EU-15 average implies that revenue from the corporate income tax is much more significant in the Czech Republic than in most other EU- and OECD countries.

36. **The key issue is whether there are pressures on the corporate income tax base or rate substantial enough to warrant adjustments.** Such pressures could stem, for instance, from increased interational mobility of capital and/or corporate tax cuts among regional competitors, but could also arise if the wider taxation of capital income is seen as excessively discouraging savings and investment. Although answering these questions is not straightforward (since they depend not only on the headline tax rate but also on its base, which in turn is a function of complex rules for capital allowances, deduction for financial expenses etc.), it is instructive to look at two central summary statistics: the average effective tax rate (AETR) and the marginal effective tax rate (METR).<sup>21</sup> The AETR basically affects the location of an investment, whereas the METR affects how much an investor will choose to invest once he has decided in which country to locate the investment.<sup>22</sup>

---

<sup>19</sup> The need for the investment tax credit and the “double-deduction” of R&D spending, however, should be reconsidered as part of the rate cutting strategy—not only to broaden the tax base but particularly to reduce the distortions associated with such incentives.

<sup>20</sup> Implying that a corporate tax rate at, say 20 percent, would bring in corporate tax revenue of 4 percent of GDP (0.2\*20).

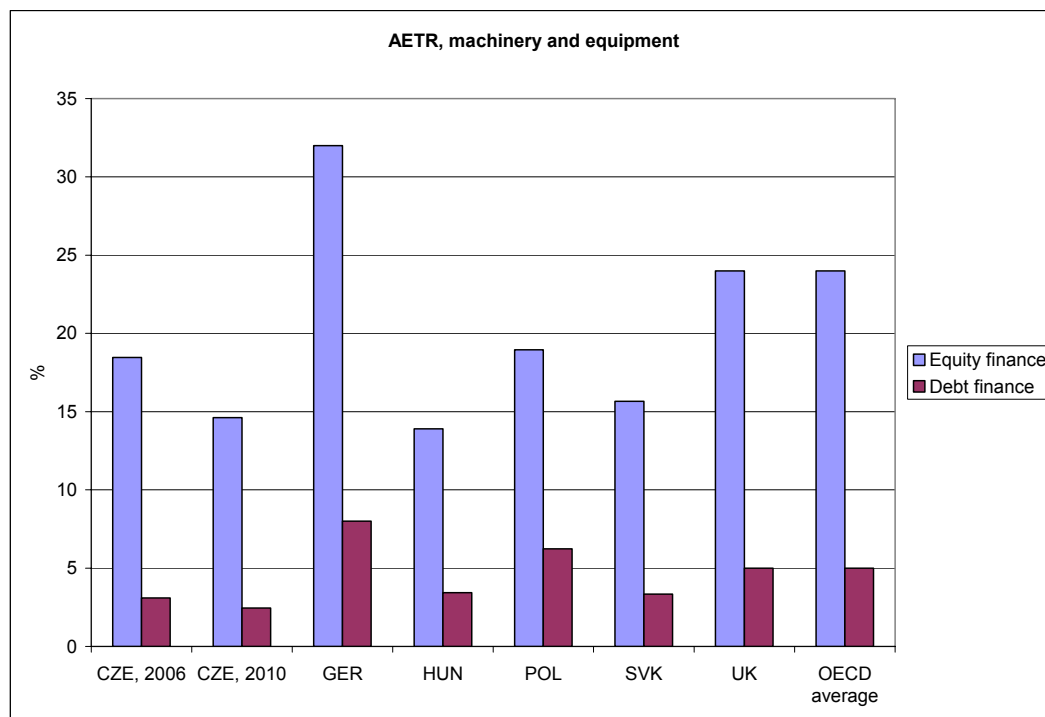
<sup>21</sup> Bearing in mind that it is the headline tax rate which is the relevant rate to consider in shaping incentives to shift paper profits in and out of the Czech Republic by transfer pricing or financial arrangements.

<sup>22</sup> Technically, the AETR is defined as the proportion of the lifetime pre-tax profit of some investment that is taken in tax. The METR is defined as the difference between before and after tax returns on a project that the investor finds just worthwhile. Both the AETR and the METR may vary across different assets and by methods of finance.



37. **At the current CIT rate, the AETR's in the Czech Republic are slightly higher than those of Hungary and Slovakia (for equity—but not for debt—financed investment), but substantially below the OECD average (Figure 17).**<sup>23</sup> This indicates that the CIT does not act as a major barrier for choosing the Czech Republic as investment location (either by inward FDI or by domestic firms). In addition, although taxation is an important variable driving FDI patterns, several studies have shown that it is only one

**Figure 17. AETR's in Selected Countries**



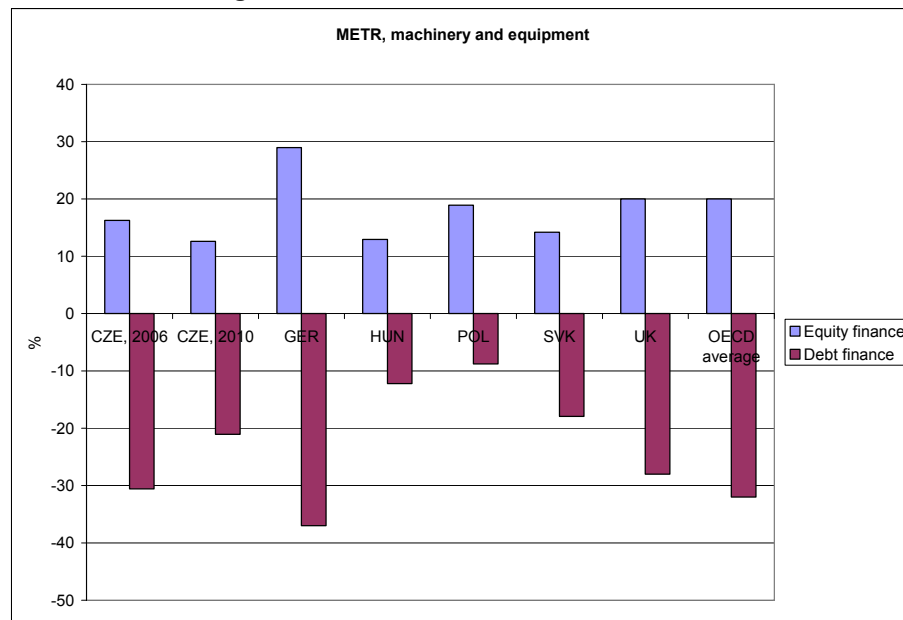
Source: Staff calculations; Devereux and others (2002).

<sup>23</sup> The AETR's and METR's calculated here are based on the same methodology and assumptions as applied by Devereux and others (2003), for a range of OECD countries (see also [www.ifs.org.uk](http://www.ifs.org.uk)). Personal income taxation is not considered in these calculations (assuming the marginal investor is a de facto tax exempt entity). If personal income tax were added to the calculation, the Czech Republic would have a lower overall rate than Hungary. Special tax preferences and investment tax credits are not considered.

parameter out of many determining investment locations of multinational businesses.<sup>24</sup> Evidently, lowering the CIT rate to 19 percent would further improve the Czech position, but at the cost of a substantial loss in revenue.

38. **The METR for investment in machinery and equipment, financed fully by new equity or retained earnings, again, is slightly higher than rates in Hungary and Slovakia, but below rates found in most other OECD countries (Figure 18).** For debt financed investment, where marginal effective tax rates are often negative because of the deductibility of interest costs (and the tax system hence provides a subsidy to the marginal investment), the Czech rates are lower (i.e. the marginal tax subsidy is higher) than for most other countries, including Hungary, Poland and Slovakia. Overall, this indicates that marginal investment is not excessively discouraged in the Czech Republic at current CIT rates and rules. Interestingly, lowering the CIT rate to 19 percent would *increase* the METR for debt financed investment (i.e. reducing the tax subsidy).

**Figure 18. METR's in Selected Countries**



Source: Staff calculations; Devereux and other (2002).

<sup>24</sup> The evidence suggest that investment decisions do respond to tax considerations. Conducting a meta-survey of 25 empirical studies, de Mooij and Vederveen (2001) find that the mean of the various estimates of the (semi-) elasticity of inward FDI to the host country tax rate is  $-3.3$ : that is, a 1 percentage point reduction of the host country tax rate raises FDI in that country by 3.3 percent. Gordon and Hines (2002), and Devereux and Griffith (2003), among many others, provide additional evidence of the significance of taxation. It is also widely recognized, however, that other factors—like education of the labor force, infrastructure, red tape, and, not least, good governance and macroeconomic and political stability—are at least as, or maybe even more, decisive for investors than are tax incentives (see for instance the McKinsey Company, 2003).

39. **In conclusion, there seems to be no urgent need to lower the corporate tax rate from its current level of 24 percent or provide other incentives for investors.** On the other hand, the trend in EU and globally points to continued further reductions of CIT rates, and it would therefore be prudent for the Czech Republic to prepare for lower CIT rates. The proposed 19 percent rate constitutes a good aiming point, but there is nothing in the analysis pointing to a need to advance the change—indeed, it could be even more back loaded than what is proposed (i.e. reaching the 19 percent later than 2010). The CIT base is relatively broad and there seems to be limited scope for offsetting revenue losses from the CIT rate cuts by base broadening measures (except for reducing or eliminating the investment tax credit and the incentives for spending on R&D).<sup>25</sup>

### **The value added tax**

40. **The proposed increase in the low VAT rate from 5 to 9 percent is a welcome step** to not only reduce distortions associated with the dual rate structure, but also to shift more of the tax burden from income to consumption.

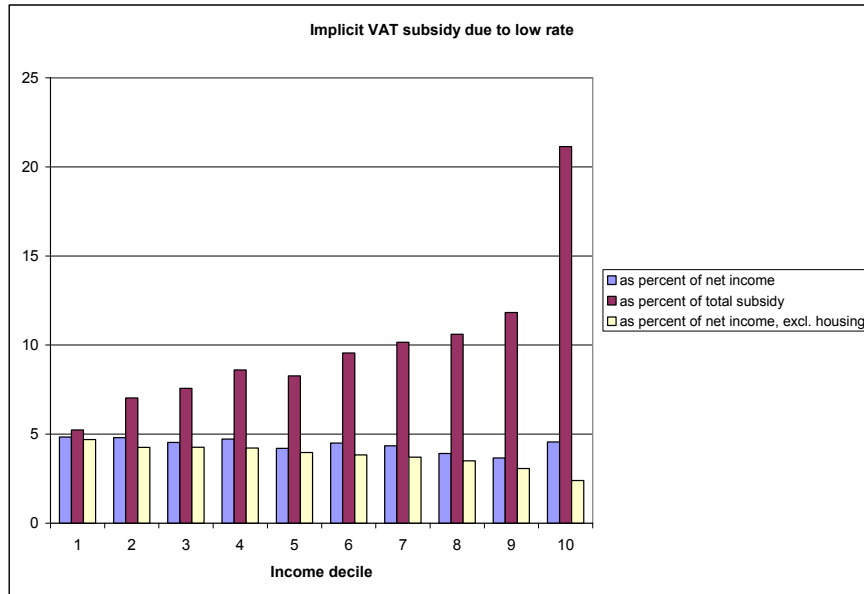
41. **Unsurprisingly, the subsidy implied by the low rate (i.e. consumers save the difference between the low rate of 5 percent and the standard rate of 19 percent) is relatively evenly distributed across income deciles when measured as percent of net income (Figure 19).** This mirrors international experience with multiple VAT rates, almost always showing a non-or only slightly progressive pattern of the subsidy. In terms of the distribution of the absolute amounts of the subsidy, the highest income decile reaps almost one-fourth of the total subsidy while the lowest income deciles only gets about 5 percent. One item, in particular, prevents the subsidy from being more progressive: the low tax rate on the first transfer of housing, which in particular benefits households in the 10<sup>th</sup> decile.<sup>26</sup> Without this item, the subsidy, as a percent of net income, would gradually decline across the income range (Figure 19).

---

<sup>25</sup> The corporate income tax system might also be enhanced by further tightening of the rules for transfer pricing and thin capitalization, but experience from other countries suggest that these are more likely base protecting, rather than base expanding, measures.

<sup>26</sup> After January 1, 2008, only residential property being provided as part of social policy will continue to enjoy the low VAT rate. The Ministry of Finance has prepared an amendment to the Value Added Tax Law that would make it possible to apply the lower 9 percent VAT rate to, among others, the transfer of apartments of up to 120 m<sup>2</sup> and family houses of up to 350 m<sup>2</sup> (floor area).

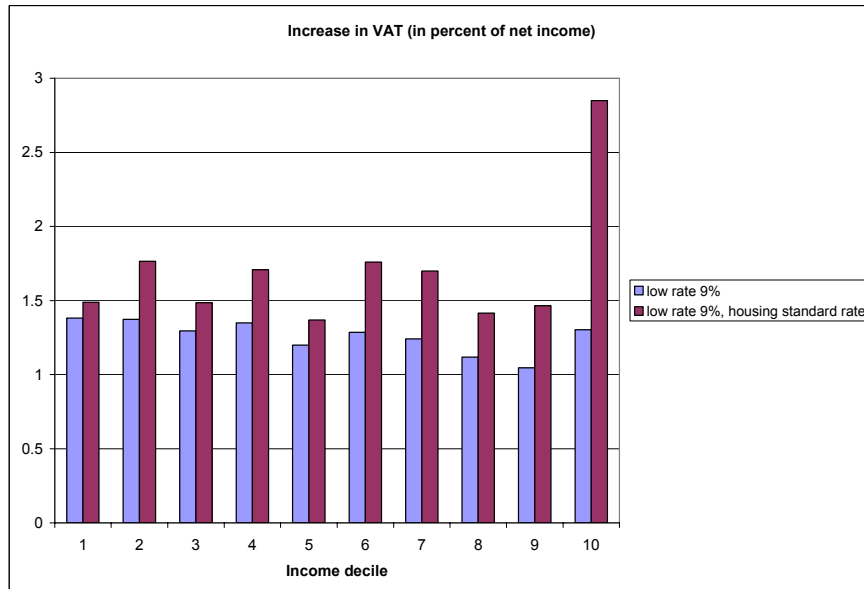
**Figure 19. Distribution of the Subsidy Implied by the Low VAT Rate**



Source: Staff calculations, based on the 2006 household survey.

42. **It follows that increasing the low rate to 9 percent would not be very regressive.** In fact, all income groups would face an increase in costs of between 1-1½ percent of their net income (Figure 20).<sup>27</sup> If transfer of housing were to become subject to the standard rate, the incremental costs would be much more substantial for the highest income decile, but basically unchanged for the lowest incomes.

**Figure 20. Distribution of Increase in Expenditures from Raising Low Rate from 5 to 9 Percent**



Source: Staff calculations and the 2006 household survey.

<sup>27</sup> Assuming no substitution across spending items or over time.

## Spending measures

### *Benefits*

43. **A key cost containing measure is the abolition of automatic indexation to the minimum living standard.** Over time this will reduce effective replacement rates (except for pensions), implying government cost savings and added incentive to seek employment for those out of work.<sup>28</sup> However, it is questionable whether it is politically feasible, or socially acceptable, to allow relative living standards of those out of work to persistently decline in comparison with those in work. Hence, there is a probability that these measures, de facto, will be fully or partly clawed back over time, thus providing temporary effects only. Most of the other benefit measures (except for the reduction in the regular and additional child benefits) are of minor importance for labor market outcomes and their cost reducing impact modest (see Appendix 1 for details).

### *Health*

44. **The measures to limit health spending would substantially reduce perverse incentives for firms and workers.** They will reduce financial incentives for firms to use the sickness benefit system as a vehicle for short-term off-loading unneeded workers and encourage businesses to verify that sickness claims are genuine (by shifting the burden of financing to the employer) as well as discourage workers from shirking (by imposing a three day quarantine on sickness benefits). These are bold measures, likely to be effective in curbing costs related to short term sickness. The issue is to what extent specific industries or groups in the labor market, with high “true” exposure to short term sickness, will be excessively burdened by the new regime. For wage earners, this could in principle be solved through wage negotiations, but for firms this would mean a “double” competitive disadvantage (financing both the sickness benefits and higher wages to compensate for the quarantine). The extent and scale of this issue remains to be seen.

45. **The introduction of user fees is also likely to be highly effective in curbing public spending.** Evidence from other countries suggest a substantial sensitivity of spending to the level of user co-payments, especially if these are low to begin with, and especially for pharmaceutical drugs and doctor’s visits (Docteur and Oxley, 2003). The cap on total annual own-payments (the cap will apply to prescription fees and doctors visits, but not hospitalization and emergency services) will shield most individuals and families from excessive additional costs and the tax reliefs to low income working individuals would, in

---

<sup>28</sup> The continued indexation for retirees does not matter as much for participation since the stock of retired individuals are unlikely to react strongly to changes in replacement rates (whereas the flow into retirement will depend on the indexation system).

most cases, be expected to more than compensate for the combined effects of the increase in the low VAT rate and the introduction of user fees. The user fees will also constitute a revenue source for the government, although the fiscal effect from this is likely to be far less than the cost savings as demand for treatment is curbed.

### *Other measures*

46. **Containing public sector payroll increases below 1.5 percent per year until 2010 might be achievable, but is not a sustainable long term strategy.** Public sector wages would normally be expected to grow more or less in line with private sector wages, otherwise a wage gap will arise or increase, which will eventually drain the public sector of labor (with the highest quality/most mobile individuals to go first). Hence, there will be a need to reduce government employment (a 3 percent annual reduction is planned), but it remains an open question whether such reductions are achievable.

### **Distributional aspects**

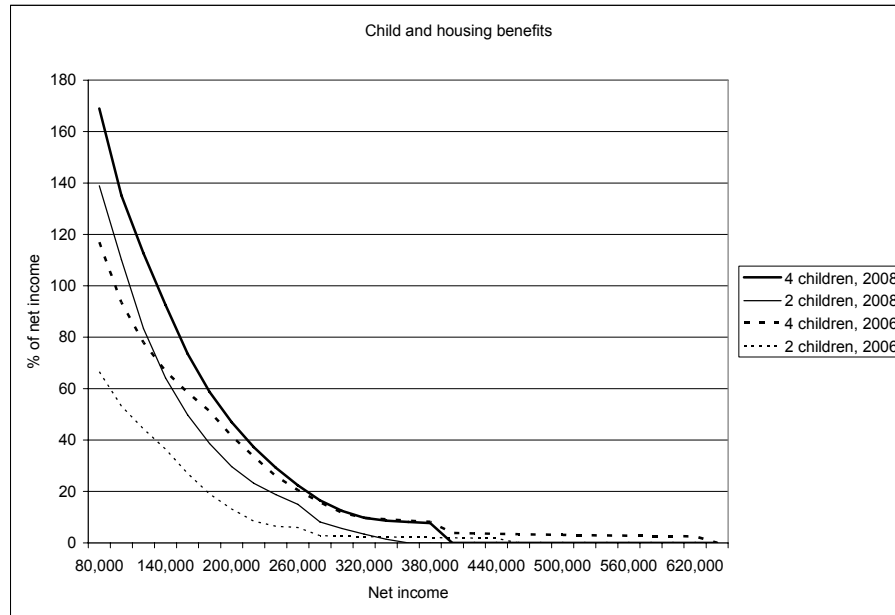
47. **The key distributional feature of the 2008 reform package is a substantial tax cut for low income working individuals and an even larger cut for high income earners.** The unemployed and recipients of social transfers will not benefit from the tax cuts (since these sources of income are not taxed) and hence be relatively worse off. This is exacerbated by the increase in the low VAT rate and the introduction of user fees in the health sector. On the other hand, social benefits have increased substantially through the 2007 reform of the accommodation allowance and minimum living standard transfer for most low income households, including those out of work.<sup>29</sup>

48. **The benefits have thus become somewhat more narrowly targeted (Figure 21).** Depending on the exact circumstances, families with annual net incomes up to CZK 200-300,000 will receive larger benefits than in 2006 (in some cases substantial increases), while families with net incomes above this range, i.e. mid- to upper income families, will receive lower or no benefits.

---

<sup>29</sup> To the extent the changes overall help to reduce long-term unemployment and raise productivity among low-skilled workers, there could also be benign dynamic distributional effects for these groups – however, as discussed above, it is not evident that such effects would be substantial.

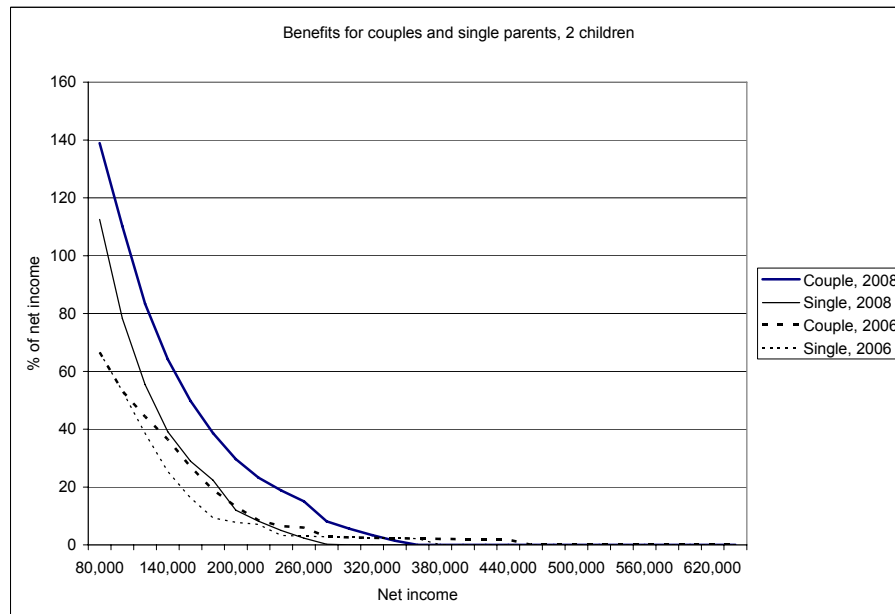
**Figure 21. Benefits (children and accommodation), 2006 and 2008**



Source: Staff calculations. Note: Calculations shown for families with two and four children, respectively, all aged 10-15 years. Accommodation allowance based on normative costs in a rented apartment in a large city outside of Prague. Additional accommodation allowance and minimum living standard transfers not included.

49. **The 2007/08 changes to benefits have moved against multi-children families and single parents:** the difference in benefits between 2 and 4 children is now smaller than before (Figure 21) and the difference between couples and single parents larger (Figure 22).

**Figure 22. Benefits (children and accommodation), Singles and Couples, 2006 and 2008**

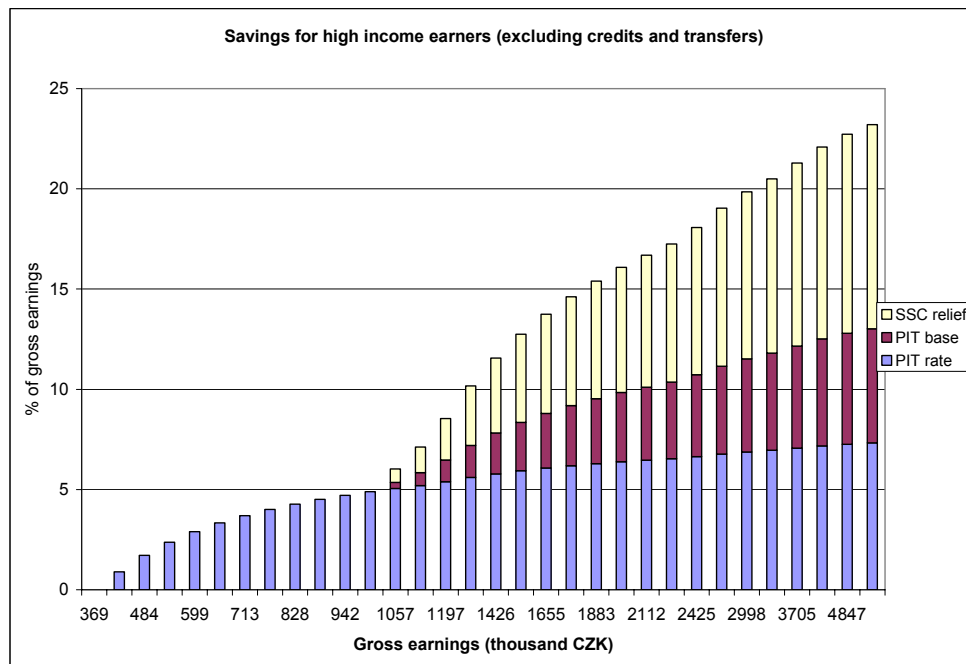


Source: Staff calculations. Note: Calculations shown for a single parent with two children and a couple with two children aged 10-15 years. Accommodation allowance based on normative costs in a rented apartment in a large city outside of Prague. Additional accommodation allowance and minimum living standard transfers not included.

50. **The increase of the lower VAT rate is likely to be more or less neutral across the income distribution, with slightly higher impact on the low and high income groups,** as discussed above. For all practical purposes, the reductions in the personal income tax will more than compensate low earning households. Since social transfers are no longer indexed to living costs, there will be no automatic compensation for the higher VAT rate for those receiving these transfers. However, many of those are likely to be part of households that receive income tax cuts.

51. **High income earners will benefit not only from the lower marginal tax rate (15 versus 32 percent), but in particular from the cap on social security contributions (Figure 23).** These features alone, notwithstanding the higher tax credits, will save high earners up to 20-25 percent of their gross earnings. The absence of individual earnings data for workers prevents an accurate estimate of the number of income earners which will benefit from the tax cuts. Based on 2004 data of those filing tax returns, the share of those with earnings above the cap on social security contributions is about 3 percent.

**Figure 23. Overall Reduction in Marginal Taxation for High Income Earners**



Source: Staff calculations, based on 2004 taxpayer data (those filing tax forms only).

52. **The changes to the health care system could have major distributional implications.** Although the distribution of health services in a universal coverage system like that of the Czech Republic is uniform ex ante, experience from other countries suggests that low income households consume more of these services than high income households (because of higher physical work-load and less healthy lifestyles). Hence, there is likely to be a regressive effect associated with the introduction of the user fee and the reduction in sickness benefits. For working individuals this is likely to be more than compensated by the



tax cuts. For social benefit recipients, however, any excessive burden arising from the user fees would need to be addressed from the spending side, through targeted measures.<sup>30</sup>

### **Fiscal implications of the package**

53. **The fiscal package is likely to improve the government balance by about ½ percent of GDP in 2008 and ¼ percent of GDP in 2009, whereas it will worsen it from 2010 absent new measures (IMF, 2008).** The short-term gains are mostly related to one-off measures, such as the postponement of the lower health care contribution from employers, and the gradual phasing in of the corporate tax cut. Once fully phased in, the reduction in employer health care contributions more than offset the additional costs for employers, resulting in a net loss for the government sector (Ministry of Finance, 2007b). Moreover, the non-indexation of benefits and the low wage increase envisaged for the public sector are likely to be short lived measures, as discussed above. Hence, the consequences of the reform package on fiscal sustainability are likely to be negative.<sup>31</sup>

54. **Some factors could potentially render the budgetary impact more positive than projected by the Ministry of Finance.** For instance, the personal income tax cuts will have second round effects on consumption and employment, which in turn may imply increased revenues from consumption and income taxes. However, the timing and magnitude of such effects are highly uncertain and depends on the exact design of the tax cuts—how many are affected at the margin, what are their elasticity of labor supply and their marginal propensity to consume. As discussed above, labor supply effects from the reform are not unambiguously positive and dynamic effects are thus likely to be modest, at best. The cut in the corporate tax rate may also lead to higher investment (again depending on elasticities to after tax cost of capital), economic activity and hence tax revenue—but again, the timing and scale are highly uncertain (and, as pointed out above, debt financed investment will become more expensive at the margin).

### **Overall assessment**

55. **The reform package includes welcome steps to move the tax burden to indirect taxation, including environmental taxes, and lowering taxation on capital income, while also reducing health spending and the generosity of some social benefit schemes.** However, it does not seem to fully deliver on its objectives, and certainly not in a cost efficient way.

---

<sup>30</sup> The government will introduce measures to cut prices for some drugs in order to compensate for the increase in the low VAT rate and the prescription fee.

<sup>31</sup> See accompanying Selected Issues Paper: “Tax and Pension Reform in the Czech Republic—Implications for Growth and Debt Sustainability” by Anita Tuladhar and Dennis Botman.

56. **First, the package will not help reducing the substantial fiscal gap—in fact, chances are that it will add to long term fiscal pressures since the tax cuts are well-defined and permanent while the offsetting spending measures are not;** second, considering the labor market structure—with disincentives to work concentrated at low- and mid level wages—the personal income tax cuts do not appear to be well-targeted and the issue of unemployment and low wage traps created by the interaction of taxes and benefits remains unresolved; third, the introduction of a cap on social security contributions limits overall revenue efficiency in a system where these contributions to some extent replace taxes as a means of financing overall government operations. Going forward, there is a need to maintain the reform momentum while combining it with careful fiscal prioritization and policies that could achieve sustainable improvements in government balances and improved labor market outcomes.

### E. A Way Forward

57. **The Czech Republic maintains government spending levels that are closer to the EU-15 average than to it's regional peers.** Government revenues, therefore, needs to be higher than among countries with lower spending levels. And, revenues are not even sufficient to ensure healthy government finances at current spending levels.

58. **This leaves little or no room for tax cuts, since the burden of reducing spending would be further aggravated if taxes were reduced.** For the Czech Republic going forward, the difficult—and delicate—policy task is to find an appropriate balance between tax increases and spending cuts that result in the required long-term improvement of the government balance.

#### Strategies to boost employment

59. **The 2008 reduction in the personal income tax, aimed at stimulating labor demand and supply, comes at the costs of untenable losses in government revenues.** It might also be a relatively inefficient instrument in addressing the problems in the Czech labor market. Going forward, several alternative routes might thus be worthwhile considering.

60. **First, there are ways to alter the tax wedge to make it less detrimental to work effort while still raising the same, or even more, revenue.**<sup>32</sup> Broadening the tax base is the first best solution. In the case of the Czech Republic, this could be done by shifting the tax burden from social security contributions to income tax and/or the value added tax for the part that is used for financing broader government operations (Box 2). This would spread the burden of taxation wider, i.e. not only to those working, but to people in unemployment or outside the labor market (in inactivity, studying or retirement), who also benefits from the welfare services. To be fully effective, such a base shift should be accompanied by a decision to make unemployment benefits and social benefits taxable.<sup>33</sup>

### **Box 2. Replacing Social Security Contributions with PIT or VAT?**

The choice between using the personal income tax (PIT) or the VAT as substitute for social security

contributions evidently involves a number of rather complex issues. It seems, however, that a strong case can be made for the Czech Republic to rely mostly on the latter:

- The traditional distributional argument - that the VAT is less progressive than the PIT – is less convincing when there is a flat income tax.
- Since social benefits are no longer automatically indexed to living costs, increases in the VAT rate will no longer automatically be compensated for recipients of social benefits, hence there is a reduction in the replacement rate that would otherwise not be there.
- The VAT does not distort savings and investment.
- Indirect taxes are a smaller part of total tax revenue than in other EU or OECD countries.
- VAT increases would help to alleviate intergenerational inequities as it taxes both past and present earnings.

<sup>32</sup> In theory, the composition of the labor tax wedge on social security contributions paid by the employer; social security contributions paid by the employee; personal income tax; and tax paid on goods and services, does not matter for labor supply and demand (the so-called invariance of incidence proposition—see e.g. Nickell, 1997). However, in practice, the composition can have a substantial influence, for instance if the minimum wage is binding for large groups (Bassanini and Duval, 2006), or if social and unemployment benefits are indexed to gross, rather than net wage developments (OECD, 2007b). Ultimately, the final incidence of any tax is determined by the wage-formation process and relative bargaining strengths of firms and the various groups inside and outside of the labor market.

<sup>33</sup> A technical solution would need to be found to ensure that benefits, like earnings, are taxed on a “grossed-up” basis.

61. **A broader base would imply that the effective wedge on labor income would decline, and that effective replacement incomes would be reduced** (if not instantly, then at least if future increases in the tax rate were to implemented at some point). This, in turn, would stimulate both labor demand and supply (OECD, 2007b).

62. **Second, for those contributions that are more closely linked to labor market activity (such as pensions), the burden of the tax wedge could be reduced by establishing a closer individual link between the contributions and the benefits**—hence making contributions feel less like a tax, being less distortionary. Some of the pension reform proposals currently under consideration will achieve this, but evidently would also require a rethinking of the distributional effects of the pension system.

63. **Third, targeted measures to certain groups in and out of the labor market might be more effective (and certainly more cost efficient) than the sweeping across the board tax cuts that are now being implemented.** In particular, since the problems of participation and long-term unemployment in the Czech Republic seem to be contained to limited and reasonably well-defined groups of the population, targeted active labor market measures would appear to be a workable solution in practice (further education; tighter and better enforced requirements for activation; limited and temporary subsidy schemes for on the job training; deregulation of labor and product markets).<sup>34</sup>

64. **Fourth, labor market policies may need to target the young.** Although educational attainment appears to explain most of the level and trend of youth inactivity, there might still be a need to strengthening educational incentives and opportunities as well as applying active labor market policies more effectively towards this age group (since there is a relatively high incidence of unemployment among the 20-24 years old). Moreover, the tax credits and child benefits should apply only for children under the age of 18 years. The current age threshold, at 26 years, is high by international standards and does not seem to correspond to neither the actual burden on parents nor the earnings capacity of the children. Reducing it to 18 years would reduce transfer spending, increase tax revenue and boost youth labor supply. A further relaxation of the employment protection of those on permanent contracts (especially rules of dismissal) would also help labor market performance in general and youth participation in particular, since these are the, by definition, outsiders on the labor market. Moreover, avoiding further substantial discretionary increases in the minimum wage (as those implemented over the past few years) would reduce the risk of further discouraging demand

---

<sup>34</sup> For a recent international comparison and discussion of active labor market measures, see OECD (2007b). See also Annett (2007), which provides empirical evidence on the effects on labor market performance (employment and wage growth) of changes to fiscal, product market and labor market policies in four successful labor market reformers in Europe.

for younger individuals (as well as the demand for other exposed groups, such as low-skilled workers and long-term unemployed).<sup>35</sup>

**65. Fifth, if more needs to be done to spur labor supply and demand at low earnings, there are better targeted instruments than lowering the tax rate or increase tax credits for all those in work.** The two classical instruments are reductions in the employers non-wage costs (i.e. their social security contributions) for those with low earnings to spur labor demand, while supply can be stimulated through an earned income tax credit for low earning individuals or households.<sup>36</sup> Both measures would, of course, have to be carefully designed (including their interaction with benefit systems), so as maximize their impact on employment at low earnings, while minimizing disincentives created further up the earnings scale as the tax preference is phased out, including not only the labor supply decision but also the incentive for undertaking education (Mullins, 2006).<sup>37</sup> At the current cyclical juncture, with widespread shortages of labor supply, it would appear appropriate to focus more on labor supply incentives and less on stimulating labor demand.

**66. Sixth, the spouse tax credit should be substantially reduced or eliminated as it now act as a significant barrier to spouse participation.** It could also be considered whether part-time jobs to a larger extent could be used to promote participation of spouses and elderly individuals (in particular women), for instance by extending (part of) the new tax credit for working retirees to individuals working part time. The Czech Republic stands out among OECD countries as having one of the lowest incidences of part time jobs, a feature that might prevent flexibility and leave a non-negligible part of the labor pool untapped. The reductions in parental benefits introduced by the fiscal reform package will contribute to a faster return of mothers to the labor market, but it should be accompanied by enhanced childcare facilities.

**67. Seventh, a strategy for the labor market would need to also consider broader measures** such as further relaxation of labor market regulations and employment protection;

---

<sup>35</sup> More analysis is also needed to understand the nature and causes of the low youth participation, in particular the role of the education system.

<sup>36</sup> Although the two measures could yield similar results, their relative effectiveness depends on the supply and demand conditions on the labor market, in particular specific rigidities such as binding minimum wages, structural unemployment etc. The former strategy has especially been adhered to in continental European countries, whereas the latter has mostly been used by Anglo-Saxon countries (OECD, 2007b). Reducing social security contributions at the low end of the earnings scale should always happen through the employer contribution so as to ensure that labor costs are reduced, also for those working at the minimum wage.

<sup>37</sup> The earned income tax credit, in particular, has also proven to be administratively non-trivial in both the United Kingdom and the United States, hence the technical issues associated with its implementation should not be underestimated.

improving overall educational attainment and implementing long-term strategies to reduce skill mis-matches; and enhancing labor mobility (reducing rent controls, improving public transportation and infrastructure, allowing portability of pensions etc.). These are all areas that are beyond the scope of this chapter.

### **Strategies for reducing costs**

68. **OECD (2006) gauges that the overall employment rate could potentially be raised by up to 10 percentage point by increasing participation and reducing long term unemployment.** This would not only help closing a large chunk of the income gap to EU-15, but also significantly bolster public finances. Hence, structural measures to boost employment along the lines listed above could dramatically improve the fiscal stance of the Czech Republic (by limiting spending on unemployment benefits and social transfers and raising more tax revenues from earnings and consumption).

69. **However, even if such beneficial effects were to materialize, there would likely still be a need to cut government spending.** Prime candidates are the health care and pension systems, but other areas could be subject to spending cuts as well, such as the entire system of social transfers, business and agricultural subsidies, the education system and other parts of government.<sup>38</sup>

70. **One particular issue is the potential for devolving more spending responsibility to municipalities, or the newly established regional authorities.** While evidently a non-trivial political and economic exercise, such an initiative could nonetheless be a stepping stone for a gradual increase in the taxation of real property, which is particularly low in the Czech Republic compared with other EU and OECD countries. It could thus form part of a strategy for tapping a relatively low distortion source of revenue, while also bringing spending decisions closer to local needs.

### **Strategies for increasing revenue**

71. **Given the substantial fiscal challenges, even structural improvements and spending compression might not be sufficient to ensure long-term fiscal sustainability.** Hence, tax increases also need to be considered. While taxation of capital is constrained by the high and increasing international mobility of capital, there is still potential to increase most other taxes without excessive distortions to the economy.<sup>39</sup>

---

<sup>38</sup> The potential for spending cuts in some of these sectors is analyzed in IMF (2007).

<sup>39</sup> On the corporate side, the special regimes and investment tax credits should be scaled back and the regimes for transfer pricing and thin capitalization tightened.

72. **The most promising route, and even one that could potentially reduce distortions, would be to eliminate the low VAT rate altogether.** There is much evidence as to the superiority of one single VAT rate in terms of efficiency and administration (Ebrill and others, 2001) and, as discussed above, the re-distributional properties of the low rate are questionable. Hence, gradually raising the low rate towards the 19 percent standard rate (or a slightly lowered unified rate) over the next, say, 10 years, could add considerably to reducing the fiscal gap.<sup>40</sup> Some compensation would have to be provided to the most exposed households, but targeted spending measures would be a better and cheaper route to follow. An alternative, possibly less contentious (but also less effective) way of raising revenue would be to move some of the items currently taxed under the low rate to the standard rate (such as package tours, transfer of housing etc.).

73. **The personal income tax could also contribute to raising revenue,** both by reducing the value of the tax credits (for instance by not indexing them for a while), and by slightly raising the 15 percent flat rate (alternatively re-introduce progressivity, for instance a second rate for high earnings).

74. **In a system, where social security contributions de facto replace taxes as a way of financing overall government operations, these contributions should not be capped.** The cap does not effectively serve its traditional purpose of strengthening the link between contributions and benefits (which in any case could be pursued through pension and health care reform) and it is detrimental to overall revenue efficiency.<sup>41</sup> The contributions of the self-employed should also be aligned with those of employees. This would not only require removing the cap on those contributions as well, but also expanding the base on which the contributions from the self-employed is calculated: currently, this base is 50 percent of net operating income, implicitly assuming that labor's share in total value added is 50 percent, rather than the 65 percent normally assumed at the aggregate level (Bronchi and Burns, 2000). The self-employed should also be obliged to pay the sickness contribution.

75. **Closer alignment of the tax burden of the self-employed with those in employment would increase revenue and reduce horizontal inequities**—in particular, the

---

<sup>40</sup> The Ministry of Finance estimates that about 28 percent of all taxable goods and services are currently subject to the low rate. The increase from 5 to 9 percent in 2008 will yield additional revenue of about 0.6 percent of GDP per year, while further increasing the rate to 19 percent would add an extra 1.3 percent of GDP to the annual revenue gain.

<sup>41</sup> Although a cap on social security contributions is not uncommon among OECD countries, a majority of countries levying social security contributions does not have a cap (OECD tax database). And, although the direct revenue loss from implementing the cap is relatively small (0.12 percent of GDP according to Ministry of Finance estimates), there might be more substantial consequences down the road from instituting such a practice (in particular, aligning the social security contributions of the employed and the self-employed without a cap could potentially result in more significant revenue improvements).

widespread practice of “pseudo” self-employment among high income earners, by which people are hired under contract to work as self-employed rather than under standard employment contracts, so as to avoid paying the full social security contributions levied on employees (OECD, 2006). Importantly, the relatively low marginal tax rate on personal income means that eliminating the cap on social security contributions for the self-employed could be done without expecting massive incentives to convert employment income into capital income (to avoid paying the social security contributions): the marginal tax rate on capital income is 35.4 percent, while it is 32.8 percent on employment income.<sup>42</sup> While the “pseudo” self-employed would generally not have the alternative to work in the informal sector, others might be tempted to cross the line, and administrative vigilance would be required.

76. **Environmental taxes could be increased further.** The Czech Republic has relatively low taxes on fuels and electricity and these have even declined as a percent of energy consumption over the past ten years (OECD, 2007b). Gasoline and motor vehicle ownership taxes would be among the least regressive (or even progressive) environmental taxes to increase.

77. **Taxes on real estate could be good candidates for increase, since these are lower than in most other EU and OECD countries.** However, in line with most other countries, these taxes are levied at the sub national level, hence it would require a re-design on central-local government relations to implement an across the board surge in these taxes for broader financing purposes.

## F. Conclusion

78. **The reforms to the tax and welfare systems, while leading to short-term budgetary improvements, do not deliver on the key objective of reducing the fiscal gap.** They might even add to the medium-to long-term fiscal pressures. The most troubling part is the reform to the personal income tax and social security contributions, which besides losing substantial revenue appear not to be well-targeted, considering the level and structure of labor market issues. The spending measures will help to streamline, and to some extent reduce, public spending, but they are insufficient and some of them are likely to be unsustainable.

79. **The most promising part of the reform is the increase in the low VAT rate, the new excises on energy consumption, and the initiatives to control health care spending and reduce abuse in the sickness benefit system.**

---

<sup>42</sup> Capital income is taxed at the margin by 24 percent corporate tax plus  $(1-0.24)*15$  percent on dividends, i.e. a total of 35.4 percent (to be reduced gradually to 31.2 percent as the CIT rate is reduced to 19 percent). Without caps, employment income is taxed at the margin by  $(1+0.35)*15$  percent per plus 12.5 percent social security and health contribution, a total of 32.8 percent.



80. **Going forward, it is imperative to flesh out and implement substantial spending reducing reform in the pension system and possibly also in the health care system and elsewhere in the government sector.** Tax increases are also likely to be necessary to fill the fiscal gap, with the key options being increasing the low VAT rate further and scaling back personal tax credits or raising the rate of the personal income tax. Raising excises and broadening the corporate tax base could also be part of a revenue raising strategy.

81. **Structural reform to enhance employment should be addressed urgently, but refocused from across the board tax measures to better targeted instrument.** If successful, such reforms, by themselves, would alleviate much of the pressure to reduce spending and increase taxes.

### **Box 3. Summary of Recommendations**

- Reduce social security contribution rates, while increasing the personal income tax and/or the VAT to achieve revenue neutrality;
- Get rid of cap on social security contributions, incl. for the self employed;
- Move gradually to one single VAT rate;
- Explore the scope for changing the child tax credit into a targeted earned income tax credit;
- Redesign child benefits and accommodation allowance such that, in combination with the tax system and social security contributions, barriers to move up income ladder are reduced;
- Reduce or eliminate the spouse tax credit;
- Introduce more and better targeted active labor market measures, in particular effective enforcement of activity requirements;
- Promote labor market flexibility, e.g. part time employment and relaxation of employment protection legislation;
- Phase out corporate tax loopholes;
- Spending restraint (and flexibility) reform: pension; health care; social transfers; other areas;
- Fill remaining fiscal gap by tax on consumption, pollution, personal income, and possibly strengthening the property tax.

## References

- Annett, Anthony, 2007, "Lessons from Successful Labor Market Reformers in Europe," IMF Policy Discussion Paper no. 01/07.
- Bassanini, Andrea and Romain Duval, 2006, "Employment Patterns in OECD Countries: Reassessing the Role of Policies and Institutions," OECD Social, Employment and Migration Working Paper No. 35.
- Benes, Jaromir and Papa N'Diaye, 2004, "A Multivariate Filter for Measuring Potential Output and the NAIRU: Application to the Czech Republic," IMF Working Paper No. 04/45.
- Bronchi, Chiara and Andrew Burns, 2000, "The Tax System in the Czech Republic," OECD Economics Department Working Paper No. 245.
- Brook, Anne-Marie and Willi Leibfritz, 2005, "Slovakia's Introduction of a Flat Tax as Part of Wider Economic Reforms," OECD Economics Department Working Papers No. 448.
- Burniaux, Jean-Marc, Flavio Padrini and Nicola Brandt, "Labor Market Performance, Income Inequality and Poverty in OECD Countries," OECD Economic Department Working Paper No. 500.
- Calmfors, Lars and John Driffill, 1988, "Bargaining Structure, Corporatism and Macroeconomic Performance," *Economic Policy*, vol. 6.
- Caliendo, Marco, Ludovica Gambaro and Peter Haan, 2007, "The Impact of Income Taxation on the Ratio between Reservation and Market Wages and the Incentives for Labor Supply," *Applied Economics Letters*, forthcoming.
- De Mooij, Ruud A. and Sjef Vederveen (2001), "Taxation and Foreign Direct Investment: A Synthesis of Empirical Research," CESifo Working Paper No. 588, October 2001.
- Devereux, Michael P., Rachel Griffith and Alexander Klemm, 2002, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, Vol. 35 (Oct).
- Devereux, Michael and Rachel Griffiths, 2003, 'Evaluating Tax Policy for Location Decisions,' *International Tax and Public Finance* 10(2): 107–26.
- Docteur, Elizabeth and Howard Oxley, 2003, "Health Care Systems: Lessons from the Reform Experience," OECD Economic Department Working Paper No. 374.

Ebrill, Liam, Michael Keen, Jean-Paul Bodin and Victoria Summers, 2001, *The Modern VAT*, International Monetary Fund, Washington, D.C.

EU-Commission/Economic Policy Committee, 2006, "The Impact of Ageing on Public Expenditure: Projections for the EU-25 Member States on Pensions, Health Care, Long-Term Care, Education and Employment Transfers (2004–50), European Economy Report and Studies No. 1.

Feldstein, Martin, 1995, "The Effects of Marginal tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act," *Journal of Political Economy*, vol. 103, no. 3.

Gordon, Roger H. and James R. Hines, 2002, "International Taxation," in *Handbook of Public Economics*, vol. 4 (edited by Alan J. Auerbach and Martin Feldstein), Elsevier Science B.V.

Hall, Robert E., and Alvin Rabushka, 1985 and 1995 (2. edition), *The Flat Tax*, Hoover Institution Press, Stanford, California.

Heckman, James, Lance Lochner and Christopher Taber, 2002, "Tax Policy and Human Capital formation," *American Economic Review*, vol. 88, no. 2.

Hemmings, Philip and Edward Whitehouse, 2006, "Assessing the 2005 Czech Proposals for Pension Reform," OECD Economics Department Working Paper no. 496.

Hurník, Jaromír Hurník and David Navrátil, 2005, "Labor-Market Performance and Macroeconomic Policy: Time-Varying NAIRU in the Czech Republic (in English)," *Czech Journal of Economics and Finance* (Finance a uver, ISSN: 0015-1920), Charles University Prague, Faculty of Social Sciences, vol. 55(1-2), pages 25-40, January.

IMF, 2004, *Czech Republic: Selected Issues*, IMF Country Report no. 04/265.

IMF, 2005, *Czech Republic: Selected Issues*, IMF Country Report no. 05/275.

IMF, 2007, *Czech Republic: Selected Issues*, IMF Country Report no. 07/85.

IMF, 2008, *Czech Republic: Staff Report*.

- Juradja, Stepan, and Daniel Munich, 2002, "Understanding Czech Long-Term Unemployment," William Davidson Working Paper No. 498.
- Keen, Michael, Yitae Kim, and Ricardo Varsano, 2006, "The "Flat Tax(es): Principles and Evidence," forthcoming in *International Tax and Public Finance*.
- Moore, David, 2005, "Slovakia's 2004 Tax and Welfare Reforms", IMF Working Paper No. 05/133.
- McKinsey Global Institute, 2003, *New Horizons: Multinational Company Investment in Developing Economies* (October).
- Ministry of Finance of the Czech Republic, 2007a, *Fiscal Outlook April 2007*.
- Ministry of Finance of the Czech Republic, 2007b, *Convergence Program*.
- Mullins, Peter, 2006, "Key Considerations in Contemplating a Negative Income Tax," IMF mimeo.
- Nickel, Stephen, 1997, "Unemployment and Labor Market Rigidities: Europe versus North America," *Journal of Economic Perspectives*, vol. 11, no. 3.
- OECD, 2007a, *Economic Outlook May 2007*, Paris, France.
- OECD 2007b, *Employment Outlook 2007*, Paris, France.
- OECD, 2006, *OECD Economic Surveys: Czech Republic*, Paris, France.
- Schiff, Jerald, Philippe Egoume-Bossogo, Miho Ihara, Tetsuya Konuki, and Kornelia Krajnyak, 2006, "Labor Market Performance in Transition: The Experience of Central and Eastern European Countries," International Monetary Fund, Occasional Paper No. 248.
- Schneider, Ondrej, 2004a, "Who Pays Taxes and Who Gets Benefits in the Czech republic", Institute of Economic Studies, UK FSV – IES Working Paper No. 68.
- Schneider, Ondrej, 2004b, "Protecting people While Enhancing Work Incentives: The Role of the Welfare System," in *Czech Republic: Ageing and Employment Policies*, OECD, Paris.

Sørensen, Peter Birch, 1999, "Optimal Tax Progressivity in Imperfect Labour Markets",  
Labour Economics, vol. 6.

Tirpak, Marcel, 2007, "Migration in EU8 countries", mimeo, Warsaw Regional Office of the  
International Monetary Fund.

World Bank, 2007, *Social Assistance in Central Europe and the Baltic States*, World bank,  
Washington, D.C.

## Appendix 1. Key Elements of Reform Package

**Personal Income Tax:** (i) Introduction of a 15 percent flat tax based on a super gross wage base that includes health and social contributions of 35 percent for the employer and 12.5 percent for the employee (calculated on the existing base, the new tax rate is 23.1 percent)—replacing a progressive tax rate scale of 12, 19, 25 and 32 percent; (ii) abolition of joint taxation for married couples; (iii) abolition of the minimum tax base for small enterprises and capping their annual cost allowance; (iv) unified final withholding rate on dividends and interest of 15 percent; (v) enhanced tax credits (like in the current system, only the child credit is refundable):

**Table A1. Changes in Standard Tax Credits (in CZK)**

	Present tax system	2008 tax system
-- for taxpayer	7,200	24,840
employed pensioner	0	24,840
-- unemployed partner (wife/husband)	4,200	24,840
-- disability (1 <sup>st</sup> level, partial)	1,500	2,520
-- disability (2 <sup>nd</sup> level, full)	3,000	5,040
-- disability (3 <sup>rd</sup> level, hard)	9,600	16,140
-- student	2,400	4,020
Tax bonus per child	6,000	10,680

Source: Ministry of Finance of the Czech Republic.

**Corporate income tax:** (i) phased reduction of corporate tax rate: from 24 percent in 2007 to 21 percent in 2008, 20 percent in 2009 and 19 percent by 2010; (ii) limited base broadening measures, e.g. stricter limits for deduction of financial expenses.

**VAT:** Increase in lower rate from 5 percent to 9 percent.

**Property tax:** (i) exemption of farm land from real estate tax at the discretion of the municipalities; (ii) setting of coefficients for real estate tax on buildings at the discretion of municipalities; (iii) reduced inheritance and gifts tax.

**Environmental tax:** Introducing taxes on electricity, coal, solid fuels and natural gas.

**Excise:** Increase in the excise tax on cigarettes and tobacco.

**Tax administration:** Raising the turnover threshold for book-keeping requirements; cancellation of the required use of cash registers with fiscal memory.

**Social contributions:** ceiling at four times the nominal average wage for employees and self-employed (previously there was no cap for employees whereas the cap for self-employed was about two times the minimum wage).

**Sickness insurance:** (i) one year postponement of the law on sickness insurance, which decreases employer contributions while shifting the responsibility of half the payments for the first 14 days of sickness to the employer; (ii) cancellation of benefits for the first 3 days of sickness; (iii) reduction in sickness benefits (mostly for short term sickness, i.e. less than one week).

**Casualty insurance:** Postponement of law on casualty insurance supplementing insurance payments with social benefits for injured workers.

**Health insurance:** (i) introduction of a nominal, flat co-payment fee for doctor's visits, emergency visits and hospital stays; (ii) freezing of budget contributions for state-dependents till 2009; (iii) an independent committee of experts is being formed to evaluate the systemic health care reform proposals of the different political parties to be implemented in 2010.

**Social benefits:** (i) deindexation of social benefits (except pensions) from the level of subsistence minimum and minimum living standards; (ii) the level of subsistence minimum and minimum living standards to be decided at the government's discretion; (iii) the level of parental and child allowance decided in absolute nominal amounts with changes requiring a new Act; (iv) standard child benefit now capped at 2.4 times the minimum living standard (MLS) against previously 4 times the MLS (Table A2); (v) the additional child benefit ("social extra allowance") limit reduced from 2.2 times the MLS to 2.0 times the MLS;<sup>43</sup> (vi) reductions in the maternity and parental benefits, the birth allowance, the foster care benefits and the funeral allowance; (vii) cancellation of the teaching aid allowance; (viii) enhanced targeting of disability (from two to three grades); (ix) stricter rules for receiving unemployment benefits (reasons for termination of employment and denial of activation); and (x) enhanced childcare facilities.

For analytical purposes, this paper also adds the changes made in January 2007 to the household accommodation allowance (which basically takes accommodation expenses out of

---

<sup>43</sup> The additional child benefit allowance ("The social extra allowance")

Current formula:

Benefit = child's basic personal requirement \* (1 - (net family income/(MLS\*2.2)))

If family net income is lower than the MLS\_family (Minimum Living Standard), the MLS\_family is used in the formula instead of family net income.

Proposed formula (source: Public Finance Reform 2007-2010, Ministry of Finance):

Benefit = child's basic personal requirement \* (1 - (net family income/(MLS\*2.0)))

If family net income is lower than the MLS\_family (Minimum Living Standard), the MLS\_family is used in the formula instead of family net income.

the MLS calculation, while introducing a new allowance for accommodation expenses, depending on income, type of accommodation, geographical location and family size).

The pre-2007 accommodation allowance was calculated as:

$$\text{Minimum living standard for household costs} * (1 - \text{net income} / (\text{MLS}_{\text{family}} * 1.6))$$

The new generic formula for the accommodation allowance is:

$$\text{Cost of accommodation (or the norm cost)} - 0.3 * \text{net family income}$$

**Table A2. The Child Benefit (monthly allowance in CZK).**

	Current regime			New regime
	0-1.5 MLS	1.5-2.4 MLS	2.4-4.0 MLS	
Family income	0-1.5 MLS	1.5-2.4 MLS	2.4-4.0 MLS	0-2.4 MLS
Child age				
0-6	576	496	256	500
6-15	706	608	314	610
15-26	810	698	360	700

**Pensions:** No legislative changes are currently in process. Discussions under the first phase of reforms have focused on (i) increasing the statutory retirement age further (beyond the currently legislated 63 years which is being phased in by 2013); (ii) tightening of eligibility criteria for pension benefits (from 25 to 35 years of occupation); and (iii) enhancing incentives for late retirement. Under the second phase of reform, proposals include (iv) second pillar reform to separate the assets of clients and fund sponsors; (v) prefunding measures to create a separate account for saving future pension surpluses; and (vi) incentives for supplementary pensions. Third phase of reforms will include models for opting out of the public pension scheme etc.

**Wage bill:** (i) freeze wages of judges and MPs at 2007 level; (ii) limit nominal payroll increase in the public sector to 1.5 percent annually during 2008-2010; (iii) reduce number of civil servants by 3 percent annually until 2010.



## II. TAX AND PENSION REFORM IN THE CZECH REPUBLIC—IMPLICATIONS FOR GROWTH AND DEBT SUSTAINABILITY<sup>44</sup>

### A. Background

82. **Czech fiscal policy faces several challenges in the near term.** As an EU member, the Czech Republic remains under the excessive deficit procedure with the general government deficit budgeted to reach near 4 percent of GDP in 2007. Fiscal policy has been procyclical owing to increases in mandatory social spending, which is expected to rise in the coming years. At the same time, regional tax competition is increasing pressures to reduce tax rates. The immediate priority is to reduce deficits in a sustainable manner below the three percent threshold under the Maastricht criteria. Longer term spending pressures for pensions and health care, given significant demographic pressures, also call for further fiscal effort to reduce deficits.

83. **To address these concerns, the government has adopted a package of fiscal reform measures** to bring the general government deficit below 3 percent by 2008. Key underlying measures include:

- Introduction of a flat rate for the personal income tax at 15 percent in 2008 and 12½ percent in 2009 (from a four-tier progressive schedule of 12, 19, 25 and 32 percent), while broadening the tax base to include social security contributions;
- Phased reduction of corporate income tax from the current 24 percent to 19 percent by 2010;
- Increase in the lower VAT rate from 5 percent to 9 percent;
- Introduction of ceilings on pensions and health insurance contributions at four times the average wage;
- Reduction of social benefits through deindexation and tightening of eligibility criteria, health care reform and a tighter wage bill.

84. **Several proposals are also being debated to address long-term pressures from aging over the coming decades.** A number of these reform proposals envisage a transition to fully funded private pension schemes where workers can divert part of their social security contributions away from the existing pay-as-you-go public pension scheme. In addition, measures to strengthen public pensions through tax increases and alternative ways of

---

<sup>44</sup> Prepared by Dennis Botman (FAD) and Anita Tuladhar (EUR).

financing the pension deficit, along with parametric changes that increase the retirement age and lower benefits, are also under discussion.

85. **This chapter seeks to analyze the macroeconomic effects of the planned reforms and additional reforms needed to restore fiscal sustainability.** Using the two-country version of the IMF's Global Fiscal Model (GFM), calibrated to the Czech economy, it analyzes the impact of the reforms and the alternative proposals for addressing the long-run fiscal sustainability challenges. Specifically, it will address four main questions:

- How will the fiscal impact of the tax and social expenditure reform affect real activity?
- What are the macroeconomic implications of different reform measures in achieving the medium term objective of a 1 percent deficit target by 2012 as stated in the Convergence Program?
- What alternative package of reforms would be most efficient in achieving lower deficits over the medium term?
- What are the long term debt sustainability implications of these reforms? What additional measures, including pension reform measures, will be needed to address the age-related spending pressures and restore fiscal sustainability?

86. The chapter is organized as follows. Section B focuses on the key challenges and longer term demographic pressures facing the Czech economy. Section C briefly describes the analytical framework and calibration of the GFM for the Czech economy, with technical details provided in the appendix. Section D analyses the impact of the tax and expenditure measures, while the final section explores the implications of additional measures for fiscal consolidation, including pension reform options, on debt sustainability.

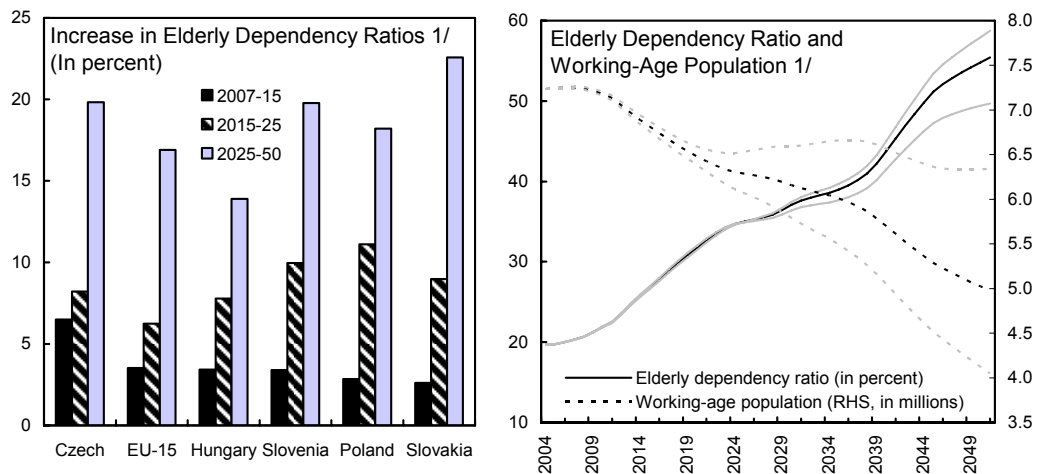
## **B. Fiscal Challenges and Demographic Pressures**

87. **A key near term challenge is to lower deficits in a sustainable manner below the Stability and Growth Pact (SGP) threshold of 3 percent of GDP.** Under the authorities plans, the 2007 general government deficit is budgeted to reach around 4 percent. Given a 'no-policy-change' scenario, deficits are expected to remain above 3 percent at least until 2010, in breach of the Maastricht criterion, adversely affecting euro adoption plans. While the recent fiscal performance suggests that the outturn will be much better than these projections owing to the strength of the economy, a structural improvement in the fiscal balance remains a challenge. The tax burden has been above the regional average to finance the relatively high primary expenditure, particularly social spending. The share of non-

discretionary spending is also relatively high compared to the regional peers.<sup>45</sup> Maintaining budgetary flexibility will be increasingly important for macroeconomic stabilization to ensure success following euro adoption.

88. **Over the longer term, the demographic shift in the Czech Republic is set to change the fiscal position significantly.** Based on Eurostat projections, the working age population is expected to decline starting around 2010 (Figure 1), and the elderly dependency ratio—the ratio of population aged 65 years and above to the population aged 15-64 years—to nearly triple from around 20 percent in 2003 to almost 60 percent in 2050. This change in the share of elderly, which reflects the low fertility rate in the Czech Republic, is much higher than the EU-15 average. The resulting increased demand on pension and long-term care benefits will place significant pressures on age-related spending. Although pension benefits, with a net replacement rate of 58 percent of wages, are relatively less generous than those of regional peers, rapid aging is set to increase pension expenditures by 4 percent of GDP and

Figure 1. Demographic Indicators, 2004-50.



Source: Eurostat.

1/ The ratio of the population aged 65 and above to the population aged 15-64.

health and education spending by an additional  $3\frac{1}{4}$  percent of GDP in 2005-50 (Figure 2).<sup>46</sup> The Czech authorities and the European Commission's Aging Working Group also estimate that age-related spending will increase by around  $7\frac{3}{4}$  percent of GDP by 2050. Combined with a shrinking contribution base, and declining labor force and growth rates, revenues will

<sup>45</sup> See IMF Country Report 07/85.

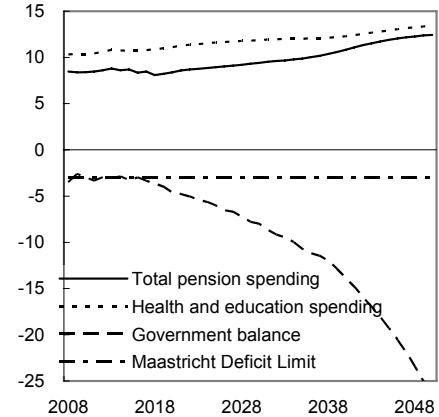
<sup>46</sup> The long term age-related spending projections are based on a Generational Accounting model that assumes the replacement rate for pensions are maintained while health care spending per capita increases at a rate slightly above productivity growth rates. For further details, see IMF Country Report No. 05/275.

also decline, adversely affecting the fiscal balance. In the absence of fiscal consolidation measures, these trends imply an unsustainable debt position. Gross debt is projected to reach over 300 percent of GDP by 2050, with primary deficits climbing from 2 percent of GDP to almost 10 percent by 2050 (Figure 3).

**89. These projections are based on a no-policy-change scenario and are subject to significant uncertainties.**

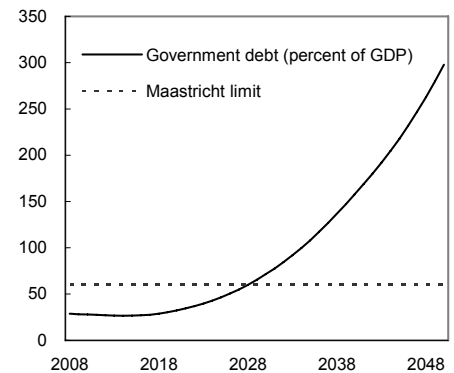
- It is assumed that the labor participation rate rises from around 72 percent in 2007 to almost 77 percent in 2050 and the age profiles underlying the generational accounting of each of the fiscal variables takes into account the increase in retirement age envisaged under the current pension plan. However, these assumptions can vary substantially depending upon the effective retirement age and the increase in the life expectancy over time.
- These projections assume labor productivity growth—to which per capita income, revenues and government spending are linked—to decline from 4½ percent in 2005 to stabilize at around 3 percent. This reflects the Czech economy gradually catching up to EU average income levels with productivity growth flattening out.
- The projections assume the real interest rate at a constant 4 percent. Given rapidly increasing debt, the risk premium can be expected to drive the cost of debt financing significantly higher.
- This scenario does not assume a change in government policy to address the rising debt dynamics. Realistically, given the projected explosive debt path, restoring sustainability will require consolidation through lower spending or higher taxes, in turn affecting output. Fiscal consolidation measures would affect the initial conditions, while pension reform measures could significantly affect the projected debt path.

Figure 2. Long-Term Fiscal Pressures in the Czech Republic (in percent of GDP)



Source: IMF Staff Calculations.

Figure 3. Debt Dynamics From Population Aging in the Czech Republic 1/ (in percent of GDP)



Source: GFM simulations.

1/ Includes the estimated deficit of 4 percent of GDP by end 2007, but not the tax reform and expenditure savings measures. Total increase in pension expenditure until 2050 equal to 4.1 percent which is modeled as an increase in lump-sum transfers. Additional spending on health and education equal to 3.3 percent of GDP until 2050 which is modeled as an increase in government spending (subject to home bias).

90. **Next, we analyze the impact of the fiscal and pension reforms on growth and debt sustainability in comparison to the baseline of a ‘no-policy-change’ scenario.** Three different scenarios are examined. In the first scenario, we assess the growth impact of the 2007 tax and expenditure reform measures. In the second scenario, we evaluate alternative tax and spending proposals for achieving the authorities’ stated medium term goal of a 1 percent of GDP fiscal deficit by 2012. Finally, we consider several pension reform proposals that seek to restore debt sustainability.

### C. Analytical Framework

91. **The GFM is calibrated to capture the key economic and fiscal features of the Czech Republic (see Appendix I).**<sup>47</sup> The model is based on a two-country, two-sector macroeconomic dynamic neo-Keynesian framework. It has a rich fiscal structure with a wide menu of taxes, social security contributions, and government transfers and spending which allows an analysis of various fiscal consolidation measures and their impact on debt sustainability in an endogenous macroeconomic model. The framework ensures a role for fiscal policy—a breakdown in Ricardian equivalence—through both demand and supply channels. On the demand side, fiscal policy has an impact on consumer behavior because consumers are impatient and have a different discount rate than the government. A fraction of consumers are also liquidity constrained with limited access to financial markets which prevents them from saving optimally over time. Supply side effects take place due to distortionary effects of taxes on labor supply and investment.

92. **Several model-specific assumptions play an important role in the transmission channels.** Home bias towards non-tradable goods in government spending is an important channel through which fiscal consolidation affects domestic output. As a small, open economy with full capital mobility, interest rates are determined by the euro area; however, a risk-premium that depends upon the net foreign asset position is introduced in the model driving a wedge between the domestic and foreign interest rates. Despite allowing for an interest rate differential, monetary policy is absent in the model since full nominal wage and price flexibility is assumed. Furthermore, in the absence of an explicit demographic structure in the model, the path for government transfers are imputed exogenously using the microeconomic Generational Accounting model as described above. In addition, GFM is a model without growth. During the catching-up phase, the real growth rate of the economy exceeds the real interest rate implying that debt accumulation is lower than the deficit. To capture this effect of a catch-up economy, the fiscal costs from aging is adjusted in the

---

<sup>47</sup> See Botman, Laxton, Muir and Romanov (2005) for a detailed discussion of the model features. See Bayoumi, Botman and Kumar (2005) for an examination of the impact of tax reform and pension reform in the United States.

simulations and this growth adjustment is the equivalent of the difference between the deficit and debt accumulation.

## D. Assessing the Fiscal Reform Package

### Tax Reform

93. **The analysis of the 2007 fiscal reform package first considers the scenario with only the tax policy measures.** Three key policy measures are included which are compared with the baseline scenario described above. First, a reduction in the personal income tax (PIT) rate to 15 percent from 2008 onwards; second, a decline in the corporate income tax to 21 percent in 2008, 20 percent in 2009 and 19 percent in 2010; and finally, an increase in the lower VAT rate from 5 percent to 9 percent along with increases in selected excise and environmental tax rates. As part of the reform, the lower PIT rate is applied on a broader base that includes the social contribution payments. In addition, there will be a substantial increase in the tax credit for lower income taxpayers. However, the GFM framework does not incorporate such base broadening measures and it is based on effective rather than the statutory tax rates. The model thus uses estimates of the impact of the reform measures which are based on those published by the authorities (Table 1).<sup>48, 49</sup>

Table 1. Estimates of Impact of Key Fiscal Reform Measures

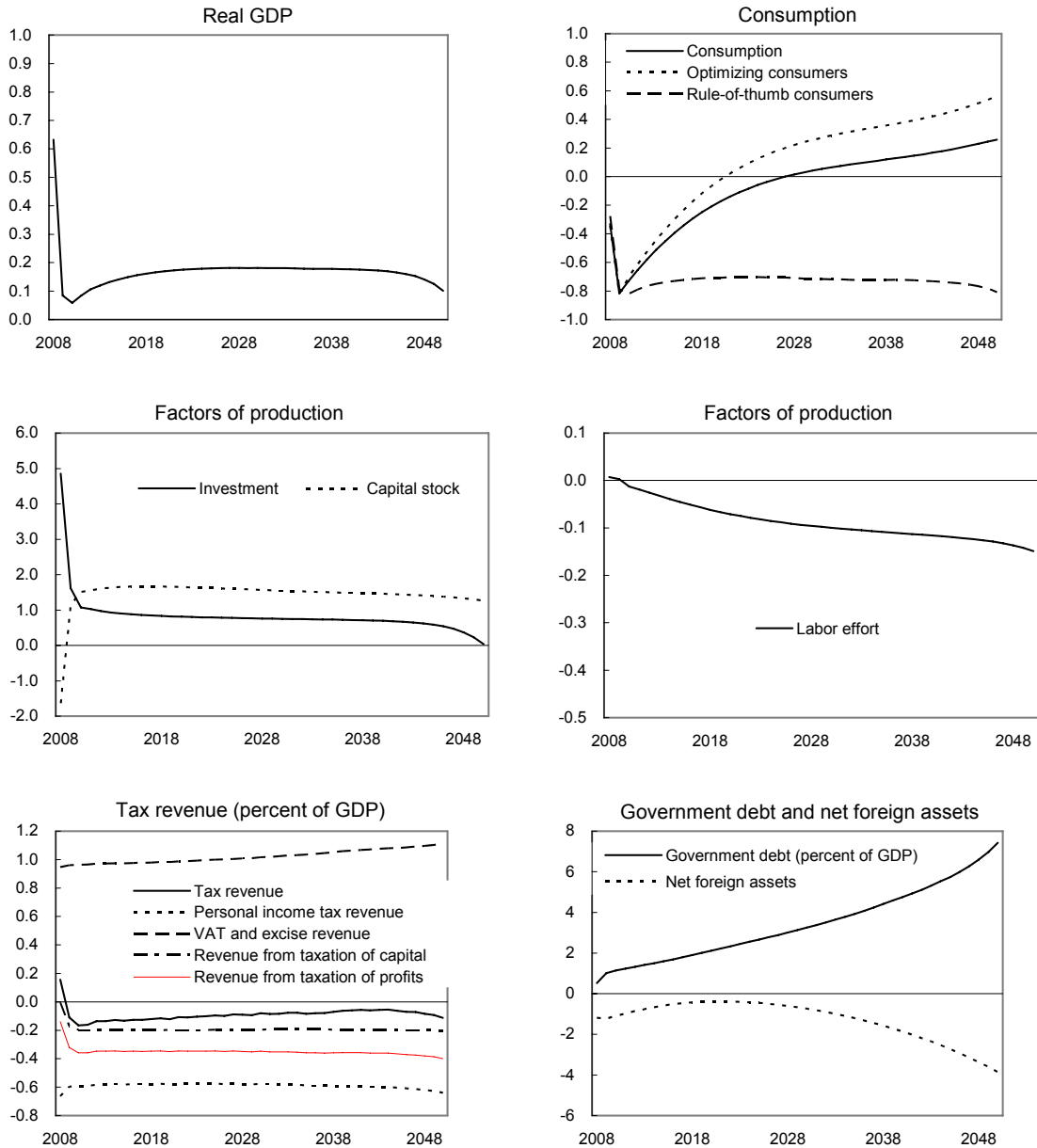
Measures	Fiscal Impact (in percent of GDP)		
	2008	2009	2010
Introduction of a flat rate of personal income tax at 15 percent (while broadening the tax base to include social security contributions and increased tax credits)	-0.6	-0.7	-0.8
Phased reduction of corporate income tax from the current 24 percent to 19 percent by 2010;	-0.2	-0.6	-0.8
Raising the lower VAT rate from 5 percent to 9 percent and increasing excise and environmental taxes	1.0	1.0	0.9
Introduction of a ceiling on social security contributions	-0.2	-0.2	-0.2
Tighter government wage bill	-0.1	-0.2	-0.3
Reduction and streamlining of social benefits, and health care reform	-0.5	-0.7	-0.6
<b>Total</b>	<b>0.6</b>	<b>0.4</b>	<b>0.1</b>

<sup>48</sup> These estimates differ from the authorities estimates (October 2007 Fiscal Outlook) due to adjustments made to exclude savings accruing from the postponement of some laws such as the casualty and sickness insurance.

<sup>49</sup> The estimates used in the simulations, which are based on an earlier government proposal, differ from the above as they do not take into account some additional measures incorporated in the final version approved by the Parliament such as the reduction of personal income tax to 12.5 percent in 2009 and faster reduction of corporate income tax in 2008. Thus, the tax reform scenario in the simulations presents a more favorable impact than is foreseen in the approved package. The simulations also provide a more optimistic scenario given that certain expenditure measures for 2009/10 (such as health care) that have been included are not yet fully identified and approved.

94. **In the near term, consumption is expected to decline (Figure 4).** This behavior reflects the combined effect of the higher VAT rates, the increase in disposable incomes from

Figure 4. Czech Republic: Macroeconomic Effects of Tax Reform  
(Deviation from "no-policy change" scenario in percentage points, unless noted otherwise)



Source: Staff calculations.

the personal income tax cuts, and the increase in the real interest rate.<sup>50</sup> A higher VAT would lead to a permanent decline in consumption. On the other hand, lower income taxes would stimulate consumption; but the net impact is subject to several sources of uncertainty: optimizing consumers would increase consumption only modestly (depending upon their planning horizon) as they seek to smooth their lifetime consumption by saving part of the higher income while the ‘rule-of-thumb’ consumers who have no access to financial markets and do not save—assumed to be 40 percent of the population—would instead consume the entire increase in income. Overall consumption declines by 0.8 percent of GDP.<sup>51</sup> Subsequently, consumption rises as the optimizing consumers gradually consume their higher wealth, more than offsetting the impact of the higher consumption tax. By raising the price of consumption, the consumption-leisure tradeoff faced by the consumer also implies that labor supply will decline.

**95. The combination of reduced corporate and labor income taxes with an increase in indirect taxes would be growth-enhancing.** The main channel of increased output would be through higher investment. Investment would rise by nearly 5 percentage points in 2008 relative to the baseline and by nearly 1 percent of GDP over the medium term. On net, the shift to a less distortionary tax base such as VAT from direct taxes would create incentives for increased investment and labor and thus lead to an expansion of output. In an aging society, the shift to indirect taxation is also appealing as it would increase reliance on a more stable tax base rather than a gradually shrinking direct tax base.

**96. Despite the favorable impact on growth, the tax package would result in a higher government debt.** Since the tax reform package is revenue-losing from 2009 onwards, the resulting increase in fiscal deficits would push debt up further by nearly 8 percent of GDP relative to the baseline scenario. This estimate, however, does not take into account the reduction of personal income taxes to 12.5 percent that was incorporated in the final version of the reform package.

---

<sup>50</sup> Since the model assumes a small open economy, the interest rate is predominantly determined by the euro area interest rate. Deviations from this rate reflect the presence of a risk premium that depends on the size of external borrowing. The sensitivity of the premium is set at a relatively low level in the model, while external indebtedness increases substantially only in the medium term under the no-policy-change scenario. Since the model does not incorporate nominal rigidities, monetary policy is absent. In reality, monetary policy would be expected to offset such a rise in interest rates, mitigating the impact on consumption. For further details, please see chapter 3 on monetary policy implications of the fiscal reform program.

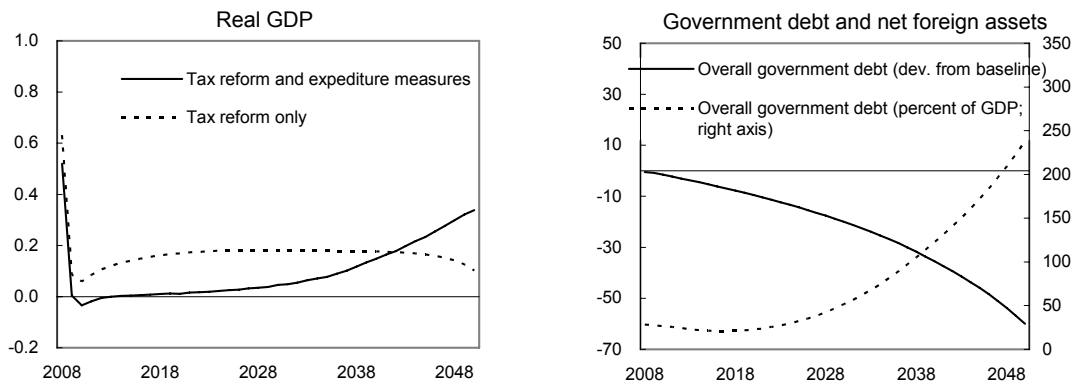
<sup>51</sup> In the absence of consumer durables, the model does not predict a decline in consumption in 2008 from anticipation effects from the VAT hike in 2008, that would lead to higher consumption towards the end of 2007. Furthermore, the increase in the lower VAT rate generally applies to non-durables such as food, education materials, for which forward buying would be limited.



## Tax and expenditure reform

97. **In combination with a successful implementation of expenditure-savings measures, the tax reform would reduce debt and expand output (Figure 5).** The authorities' plan targets a reduction of expenditures on average of around 0.7 percent of GDP from 2008 onwards. The model predicts that the combination of tax and expenditure measures are less growth friendly over the medium term than the tax measures alone as permanently lower transfers reduce consumption. Nevertheless, longer-run growth is higher

Figure 5. Czech Republic: Macroeconomic Effects of Tax Reform and Expenditure Restraint (Deviation from "no-policy change" scenario in percentage points, unless noted otherwise)



Source: Staff calculations.

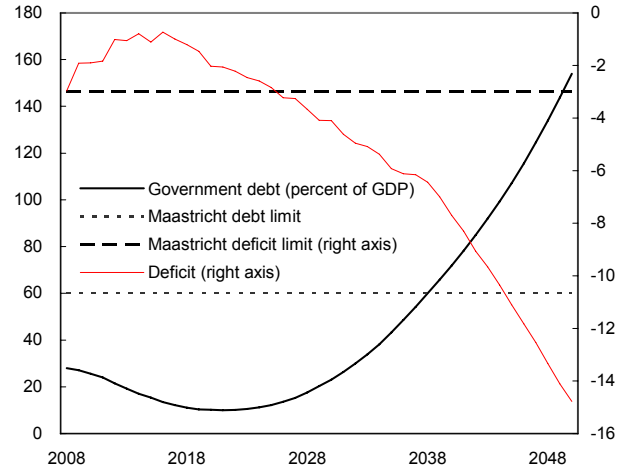
owing to the more favorable debt dynamics that is supportive of a lower real interest rate. The model predicts debt to be lower by 60 percent of GDP compared to the baseline scenario so that the gross debt level approaches 250 percent of GDP. Thus, the challenge of long-run debt sustainability is not addressed by this reform package. Nevertheless, the reform package is growth-enhancing and reduces debt relative to the no-policy-change scenario although, it should be borne in mind that since these expenditure measures have not yet been fully identified, these estimates represent an optimistic assessment of the fiscal reform package.

98. **These results are also robust to alternative specifications of the parameters as shown by the sensitivity tests** (Appendix II). We consider scenarios with more patient consumers who have a longer planning horizon, fewer rule-of-thumb consumers that are subject to credit constraints, less elastic labor supply and a lower intertemporal elasticity of substitution. Among these, only in the case with a longer planning horizon of consumers, consumption smoothing leads to a more limited decline in consumption relative to the baseline which contributes to higher output. In other cases, the economic impact relative to the baseline is broadly similar, although the baseline level itself is affected more significantly under these scenarios.

## E. Adjustment Strategies to Achieve the Medium Term Objective

99. **Additional adjustment measures necessary to meet the authorities' medium term objective are also considered.** In the Convergence Program, the authorities have targeted a medium term deficit target of 1 percent in 2012, requiring a further reduction in deficit of about 1½ percent of GDP over 2010-2012. To achieve this adjustment, we consider alternative packages of revenue-based and expenditure-based measures. We consider alternative revenue proposals of: (i) a higher VAT and income tax base-broadening measures; (ii) increases in social security contributions. On the expenditure side, we simulate the impact of (iii) lower government spending; and (iv) reduced government transfers. In addition, the impact of a combination of these measures is also assessed. The simulations examine the relative impact of these measures on debt and growth and whether they are sufficient to address the long-run debt sustainability challenges with a no-policy-change scenario from 2012 onwards.

Figure 6. Deficit and Debt Dynamics With 1 Percent of GDP Deficit in 2012 1/ (in percent of GDP)

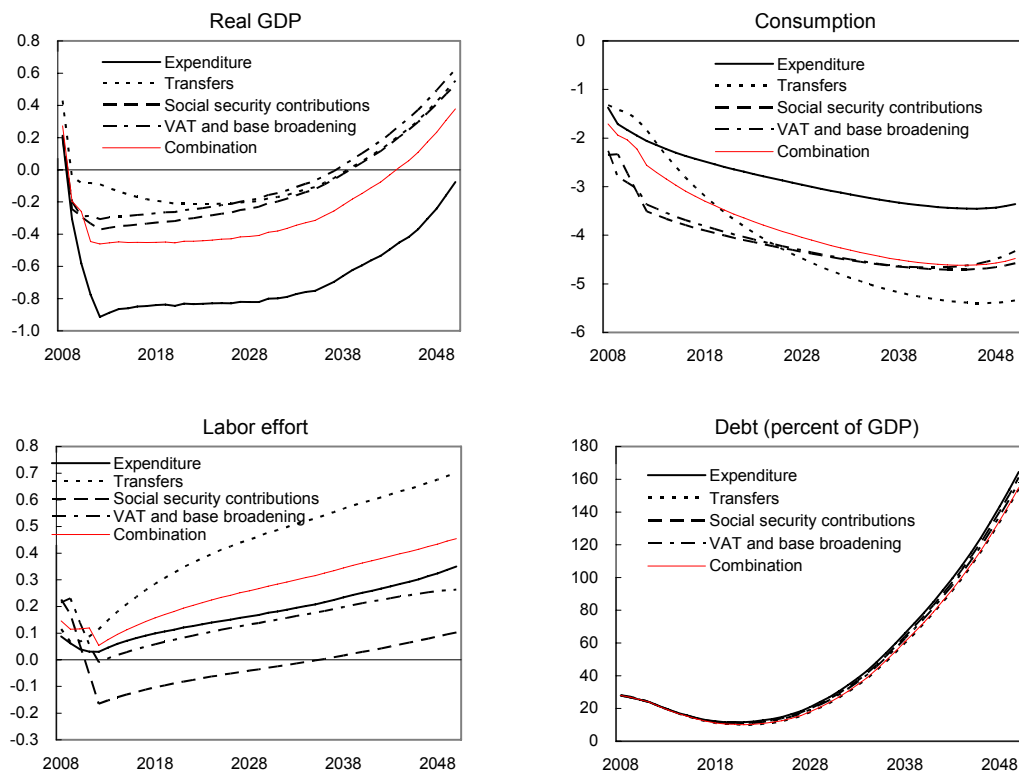


Source: GFM simulations.

1/ The simulation includes, in addition to the baseline no-policy-change scenario, the effects of tax reform proposals and expenditure restraint and further deficit reduction between 2010-12 to reach the intended goal of a 1-percent of GDP deficit by 2012.

100. **Fiscal consolidation through lower government transfers has a relatively minimal impact on growth compared to other revenue-enhancing measures (Figure 7).** Since lump sum government transfers are non-distortionary and the decline in consumer demand also impacts imports, the net effect on growth in the near term is limited. In contrast, a reduction in government consumption which is assumed to fall entirely on non-tradables due to the home bias in the model, has the most significant contractionary impact on growth. In line with the discussion in section D, an increase in VAT has the smallest negative impact on growth relative to other revenue measures as it is the least distortionary tax applied—it has a larger base that includes accumulated savings. Irrespective of these measures, debt still climbs to almost 150 percent of GDP, suggesting the need for further measures that directly address age-related spending pressures.

Figure 7. Comparing Alternative Measures to Reach 1 Percent of GDP Deficit by 2012 1/ (Deviation from baseline no-policy-change scenario, in percentage points, unless noted otherwise)



Source: Staff calculations.

1/ Includes the effects of tax reform and expenditure restraint. Further deficit reduction between 2010-12 to reach the intended goal of a 1-percent of GDP deficit by 2012.

101. **In practice, a combination of the revenue and expenditure measures can be expected to achieve the medium term objective, rather than relying on large changes in any specific tax or expenditure measure alone.** Such a package of measures also compares favorably to individual measures in terms of output and consumption losses. Henceforth, the paper assumes that this combination package of measures will be implemented and further measures to restore debt sustainability built upon it.

## F. Achieving Long Term Sustainability: Pension Reform Proposals

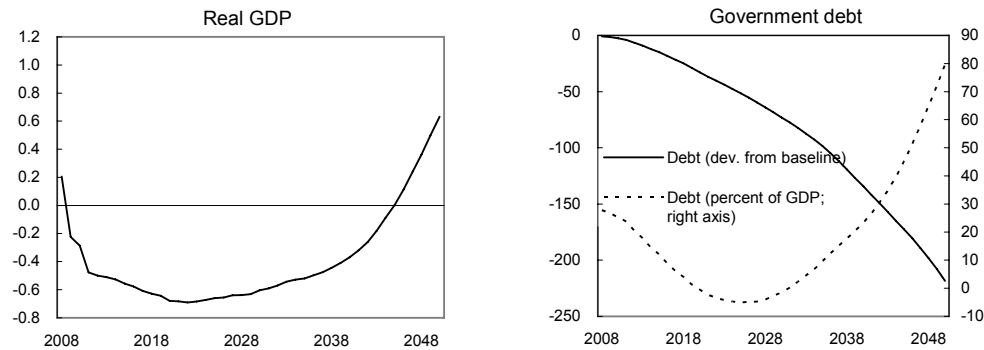
102. **To achieve long term fiscal sustainability in the face of age-related spending pressures, several key pension reform proposals are examined.** In particular, three proposals under discussion by the authorities are simulated: (i) extension of the retirement age to 65 years (ii) prefunding of reserves through fiscal consolidation measures and (iii) a default option of increased social security contributions to achieve debt sustainability. The criteria for sustainability is based on fulfillment of the SGP threshold of 60 percent debt to GDP ratio and the 3 percent deficit to GDP ratio. These proposals are simulated as incremental to the medium term consolidation through a package of measures described

above. As an alternative, a voluntary opt-out of the mandatory public pension system is also considered.

### Extension of retirement age

103. **Extending the retirement age would relieve fiscal pressures, although not sufficiently to attain debt sustainability over the longer term (Figure 8).** The simulation considers increasing the statutory retirement age from 63 to 65 years phased in by 2018. The reduction in government transfers would contribute to a further decline in output. But, in addition to reducing the burden on future pension benefits, increasing the statutory retirement age would increase labor supply with associated gains in social contributions and tax revenues. The resulting impact in lowering the deficit would reduce gross debt and even lead to a small build-up of reserves.<sup>52</sup> Nevertheless, this measure is not significant enough to compensate for the increase in the old-age-dependency ratio and deficits still rise, crossing the 3 percent of GDP threshold by 2039.

Figure 8. 1-Percent of GDP Deficit by 2012 Through Reform Package and Raising Retirement Age (Deviation from "no-policy change" scenario in percentage points, unless noted otherwise)



Source: Staff calculations.

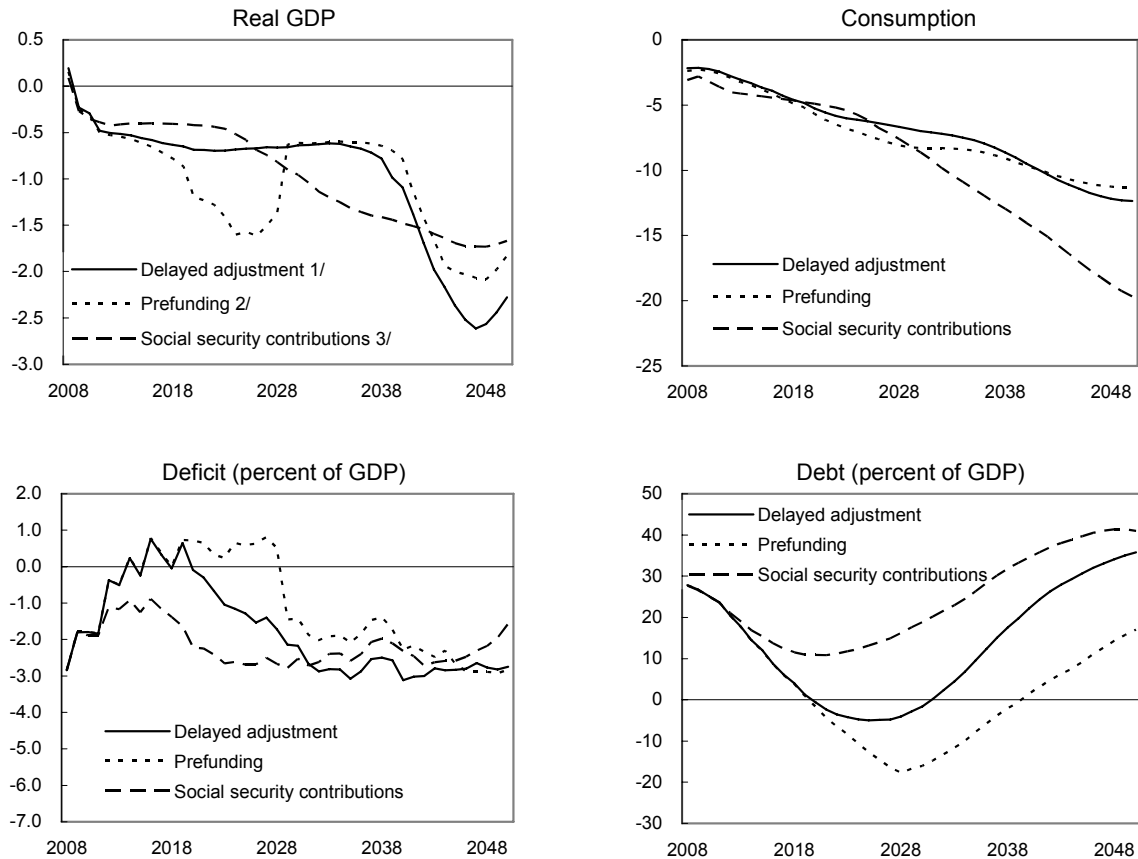
### Delayed fiscal consolidation

104. **To fulfill the debt sustainability criteria through 2050, an additional combination of fiscal measures is considered (Figure 9).** In the delayed consolidation scenario, further yearly measures comprising VAT, base broadening and expenditure savings are undertaken from 2039 onwards to keep the deficit below 3 percent, while also maintaining debt below 60 percent of GDP. These measures prevent the current steep increase in debt towards 2050 but also lead to a substantial decline in consumption and

<sup>52</sup> Since GFM does not endogenously model the direct effect on labor supply from increasing the retirement age, the impact on the working age population and revenue is estimated exogenously using a microeconomic model. The macroeconomic effects of this projected deficit are then simulated using the GFM.

output during this period, implying a significant shift of the fiscal burden to future generations.

Figure 9. Comparing Alternative Strategies to Achieve Debt Sustainability  
(Deviation from baseline no-policy-change scenario, in percentage points, unless noted otherwise)



Source: Staff calculations.

1/ Includes the effects of tax reform and expenditure restraint and raising the retirement age. Further deficit reduction between 2010-12 to reach a 1-percent of GDP deficit by 2012 through a combination of measures. Subsequent adjustment: higher VAT rate (2041-45; 2.5 percentage points in effective terms), base broadening (2046-47), and lower current government spending and transfers (2039 onwards).

2/ Includes the effects of tax reform and expenditure restraint and raising the retirement age. Further deficit reduction between 2010-12 to reach a 1-percent of GDP deficit by 2012 through a combination of measures. Subsequent adjustment: higher VAT rate (2020-24; 0.5 percentage points in effective terms), base broadening (2025-27), and lower current government spending and transfers (2020 onwards).

3/ Includes the effects of tax reform and expenditure restraint, but no increase in the retirement age. Further deficit reduction between 2010-12 to reach a 1-percent of GDP deficit by 2012 through higher social security contributions on workers or employers. Subsequent yearly adjustment in the social security contribution rate to remain within Maastricht debt and deficit limits.

## **Prefunding through upfront consolidation**

105. **Prefunding of the deficits would help ensure inter-generational equity.** We examine the impact of frontloading the measures mentioned above as early as 2020 such that deficits remain below the 3 percent of GDP threshold through 2050. These measures lead to a decline in gross debt sufficiently to build up fiscal reserves from 2020. This comes at a higher output cost and decline in consumption over the medium term as government transfers are reduced and VAT is increased. However, prefunding would allow for higher output in the longer run than would be the case otherwise. Prefunding thus provides several advantages. By ensuring that the output costs are borne primarily by the beneficiaries of the government transfers, greater generational equity is achieved. Early consolidation is also attractive as it ensures that output losses occur at a time when the economy is still experiencing the gains from income convergence. Prefunding could be achieved by reducing gross debt or by building up a separate pension reserve fund: the two would be equivalent if the costs of borrowing is equal to the return on the reserve assets.

106. **If consolidation efforts are smoothed across generations, output costs for future generations could be minimized.** In this scenario, although long run debt and output levels would be similar, the transition path would vary considerably. The early fiscal surplus and lower initial debt levels cushions the impact of rapidly rising pension deficits, preventing a rise in interest rates. This allows for a relatively higher levels of capital accumulation and output growth over the medium term.

## **Increase in social security contributions**

107. **In the absence of pension reforms, social security contributions would need to rise to offset the age-related spending pressures and maintain debt within the Maastricht limits until 2050.** Social security contributions would thus begin rising from 2010 to achieve the 1 percent of deficit by 2012.<sup>53</sup> Subsequently, the social security contribution rate adjusts annually to ensure deficits remain below the 3 percent of GDP limit and debt is maintained within the 60 percent threshold in 2050.

108. **The rise in the social security contributions would adversely impact labor supply and consumption.** In this scenario, the distortionary effect of the labor tax leads to a decline in labor supply. The increase in taxes would offset the higher age-related spending. Compared to the alternative consolidation scenarios described above, output costs are more limited as it does not involve a reduction of government spending—which is subject to home bias in the model—thereby limiting the decline in domestic demand. Since the three

---

<sup>53</sup> It is assumed that the higher social security contributions are applied on employees. In GFM, the impact would be identical if instead social security contributions paid by employers would increase.

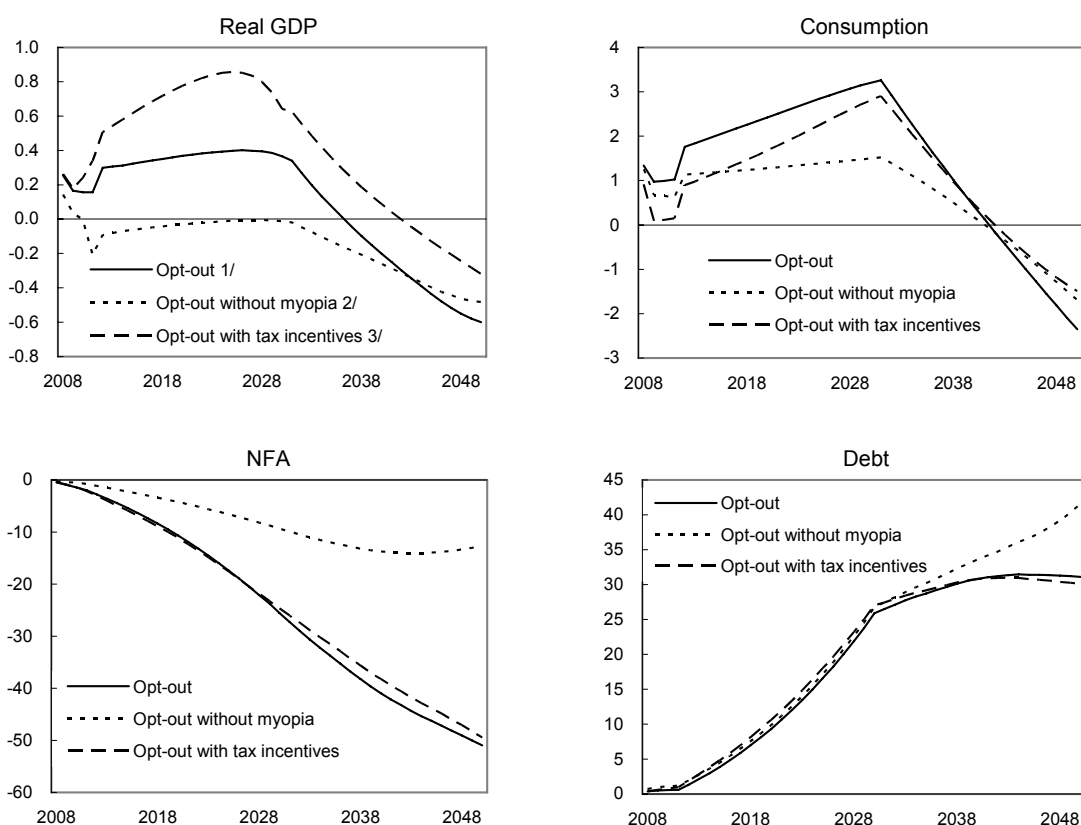
measures are quite equivalent from the GDP perspective, given the detrimental effect on consumption of increasing social security contributions, the option of prefunding appears preferable to the other measures.

### **Voluntary transition to private pensions**

109. **Following some of the reform proposals under discussion, we consider an alternative proposal to allow workers to voluntarily divert part of their social security contributions to private pension funds (Figure 10).** To illustrate the effects of this policy, we have to make a number of simplifying assumptions. In particular, it is assumed that 4 percentage points ( $1/3^{\text{rd}}$  of the current social security contributions paid by the worker) of wage incomes are transferred to private accounts. Workers up to the age of 46—the assumed average age of workers—have the option to participate from 2012 onwards and it is assumed that all of those eligible will opt out, which thus amounts to half the labor force. The government thus loses 2 percent of the social security contributions in 2012 and, assuming workers start working at the age of 27 years, the revenue loss will gradually rise until it reaches 4 percent in 19 years, i.e. 2031. It is also assumed that everyone retires at age 65 so that private pensions start paying benefits after 19 years (2031). Benefits under the public pension system are unchanged till then, driving up the transition deficits and debt. Subsequently, benefits will start declining and debt will stabilize. The model does not allow for higher investment returns from the private pension funds.

110. **The macroeconomic impact of voluntary private pension contributions depends to a large extent on consumer myopia.** Given this option, consumers who are liquidity constrained and those that are impatient do not fully save the surplus that accrues from the reduction in social security taxes. Effectively, the myopic consumers discount the lack of traditional social security benefits in the future. Consumption and output increase in the short run at the expense of a large long run decline. In the long run, consumption falls due to a decline in the traditional social security benefit payments. If consumers have longer planning horizons—making them more Ricardian—there is less of an initial consumption boom as they factor in the loss of traditional pension benefits in the long run. Consumers save more in

Figure 10. Pension Reform From 2012 Onwards After 1-Percent of GDP Deficit Through Package (Deviation from 1-percent of GDP deficit by 2012 only, in percentage points)



Source: Staff calculations.

1/ Includes the effects of tax reform and expenditure restraint and further deficit reduction between 2010-12 to reach a 1-percent of GDP deficit by 2012 through a combination of measures. From 2012 onwards, 4 percentage points (in effective terms) of social security contributions can be diverted to private pension savings accounts effective terms. All workers younger than 46 in 2012 are assumed to participate. Revenue loss to the government peaks in 2031, but savings on public pensions also start to accumulate from 2031 onwards.

2/ Same as in Footnote 1, except that the planning horizon of optimizing consumers is equal to 100 years ( $q = 0.99$ ).

3/ Same as in Footnote 1, but incorporates incentives to save and invest through a revenue neutral tax reform from direct (corporate income) to indirect (VAT), which gradually increase from 2012 onwards to reach 1.25 percent of GDP by 2031.

the form of private pension contributions which results in higher capital accumulation, output and consumption over the long run. To offset the consumer myopia, a revenue neutral tax incentive could be considered that increases voluntary incentives to save. For example, if there is a reduction in corporate income tax that encourages capital accumulation, with an offsetting shift towards indirect taxation (VAT), private savings would increase leading to higher output over time.

111. **Given the output costs associated with consolidation measures needed for restoring fiscal sustainability, strong emphasis should be laid on complementary structural reform measures that improve productivity and labor supply.** Micro-level incentives generated by the tax and welfare reform discussed in this paper will be important



in this regard, both for increasing the effective retirement age as well as through minimizing welfare traps created by the marginal effective tax rates. Furthermore, in line with the Lisbon agenda, reform policies will need to focus on enhancing investment in research and development; and increasing the flexibility of the labor and the product markets.<sup>54</sup>

## G. Conclusions

112. **The Czech government has recently adopted a package of fiscal reform measures that seeks to address a number of challenges.** As an EU member, an immediate priority for Czech fiscal policy is to reduce deficits in a sustainable manner below the three percent of GDP threshold. The fiscal consolidation also needs to improve incentives to work and enhance competitiveness. Longer term spending pressures stemming from pensions and health care, given significant demographic pressures, also call for early reform efforts to put public finances on a sustainable path.

113. **In this context, the recently approved fiscal reform package is assessed in terms of its macroeconomic impact on growth and long run debt sustainability.** The main findings are as follows:

- The tax and expenditure reform package is efficiency-enhancing: it supports growth as the tax system becomes less distortionary. The debt burden is also lowered slightly, assuming the expenditure measures are fully implemented. However, debt dynamics remain unsustainable over the long run.
- A ranking of an alternative set of consolidation measures to achieve the medium term objective of 1 percent of GDP deficit target suggests that a combination of reducing government transfers and spending and further increasing indirect taxation has the lowest output and consumption costs.
- Given the aging pressures, restoring debt sustainability will require additional reforms above and beyond the measures described above. A further increase in the retirement age is desirable, but will also not suffice.
- The choice of the pension reform measures will depend on additional considerations such as intergenerational equity and consumer myopia. Upfront consolidation that allows for prefunding of pension reserves would promote generational equity in sharing the fiscal burden of aging. Opting out of the public pension system would

---

<sup>54</sup> See Botman and Kumar (2007) for an analysis of the impact of structural reforms on alleviating Germany's fiscal sustainability pressures. Also see chapter 1 for a discussion of the microeconomic impact of the Czech fiscal reform package on work incentives.

limit output costs over the medium term, but at a cost of sizable transition deficits and long-term output loss, depending upon the degree of myopia of consumers.

## References

- Bayoumi, T., D. Botman, and M. Kumar, 2005, "Effects of Social Security and Tax Reform in the United States," *United States-Selected Issues*, IMF Country Report No. 05/258 (Washington D.C.: International Monetary Fund).
- Bičáková, A., J. Slačálek, and Slavík, M. 2006, "Fiscal Implications of Personal Tax Adjustment in the Czech Republic," Czech National Bank Working Paper No. 7 /2006, (Prague: Czech National Bank).
- Botman, D., D. Laxton, D. Muir, and A. Romanov, 2006, "A New-Open-Economy-Macro Model for Fiscal Policy Evaluation," IMF Working Paper 06/45 (Washington DC: International Monetary Fund).
- Botman, D., and M. Kumar, 2007, "Global Aging Pressures: Impact of Fiscal Adjustment, Policy Cooperation and Structural Reforms," IMF Working Paper 07/196 (Washington D.C.: International Monetary Fund).
- Botman, D., and D. Iakova, 2007, "Policy Challenges of Population Aging in Ireland," IMF Working Paper 07/247 (Washington D.C.: International Monetary Fund).
- European Commission, 2006a, "The Impact of Ageing on Public Expenditures: Projections for the EU25 Member States on Pensions, health Care, Long-Term Care, Education and Unemployment Transfers (2004-2050)," (Brussels: European Commission).
- European Commission, 2006b, "Long-term Sustainability of Public Finances in the European Union," (Brussels: European Commission).
- Mattina, T., 2007, "Efficiency and Flexibility of Public Spending," *Czech Republic Selected Issues*, IMF Country Report No. 07/85 (Washington D.C.: International Monetary Fund).
- Ministry of Labor and Social Affairs, 2004, *Actuarial Report on Social Insurance* (Prague: Ministry of Labor and Social Affairs).
- Tuladhar, A., 2005, "Impact of Aging on Fiscal Sustainability," *Czech Republic—Selected Issues*, IMF Country Report 05/275 (Washington D.C.: International Monetary Fund).

## **Appendix I. Analytical Framework**

**The GFM is a general equilibrium New Open Economy Macroeconomics model designed to address fiscal issues in an interdependent world economy.** To allow a role for fiscal policy, specific model features are introduced which leads to a breakdown of Ricardian equivalence in this intertemporal model. In particular, the private sector has finite horizons and is more impatient than the government. Consumers discount government's fiscal policy actions more heavily, thus affecting the national savings rate. In addition, some of the consumers (rule-of-thumb consumers) lack access to capital markets and are liquidity constrained. Finally, the monopolistic power of firms creates a wedge in prices and wages compared to the perfectly competitive outcome, which reduces the distortionary effects of tax policy.

Other key features of the model are:

- Three agents: a representative agent with perfect foresight, firms producing final consumer goods and government;
- Two sectors: tradables and non-tradables;
- Two factors of production: capital and labor, which are mobile across sectors;
- Two country setup: home and foreign, across which goods and capital are also perfectly mobile;
- Two types of assets: an international tradable government bond and domestic equity;
- Consumption and output are based on constant elasticity of substitution utility and production functions;
- Investment is determined by a Tobin's Q relationship – a discounted value of future profits and capital stock;
- Flexible prices and wages;
- Four types of taxes: social security contribution tax on wages, corporate income tax on accounting profits of firms, personal income tax on labor income, interest income, accounting profits, and government transfers; and value added tax on consumption;
- Government spending which falls on (i) non-traded goods (ii) debt servicing and (iii) lump sum transfers to consumers.

### **Model Parameters**

**The model parameters are calibrated to fit Czech macroeconomic data.** The steady state macroeconomic variables—consumption, investment, government spending, labor and capital income to GDP—are the end-2006 data for the Czech economy. Fiscal variables—social security contributions, capital and personal income tax, and debt to GDP ratios—also reflect end-2006 data. As a small economy—the Czech Republic is assumed at about 2.5 percent the size of the world GDP—interest rates are largely determined by euro area monetary policy.

**The model parameterization for consumer and firm behavior is based on microeconomic estimates in the literature.** For simplicity, it is assumed that these parameters are the same for the home and foreign economies. The effective planning horizon parameter is set at 0.9, which translates to a planning horizon of 10 years. Since this value is lower than the probability of survival, this captures consumer myopia in the model. The elasticity of labor supply to real wages, is set to 0.92. The elasticity of intertemporal substitution is set at 0.33. This is slightly lower than econometric estimates, but these estimates are based on models with habit formation, which is not a feature of this model. The intratemporal elasticity of substitution between labor and capital is set at 0.75 for the baseline case; in the Cobb Douglas case, this would be close to 1. About 40 percent of consumers are assumed to be liquidity constrained. Details on the steady state values and parameters are presented below:

---

**GFM Parameterization**


---

	Czech Republic
Elasticity of Substitution	
for holding money ( $\rho$ )	3
between consumption and leisure ( $\eta$ )	0.92
for the production of the final good	
between tradables and nontradables ( $\epsilon$ )	0.6
between domestic tradables and imports ( $\omega$ )	2.5
between imports from differing countries ( $\omicron$ )	1.5
Bias in	
the production of	
tradables over non-tradables ( $\gamma$ )	0.75
domestically produced tradables over imports ( $\alpha$ )	0.16
imports from ( $\nu$ )	
Czech Republic	...
Rest of the world	0
Production Functions	
Tradables	
Elasticity of factor substitution ( $\xi$ )	0.75
Bias towards	
Labor ( $1-\mu$ )	0.23
Capital ( $\mu$ )	0.78
Non tradables	
Elasticity of factor substitution ( $\xi$ )	0.75
Bias towards	
Labor ( $1-\mu$ )	0.23
Capital ( $\mu$ )	0.78
Real Rigidities	
Investment ( $\psi$ )	1
Markups over marginal cost	
for tradables ( $\theta$ )	14.3
for nontradables ( $\theta$ )	14.8
Probabability of survival ( $q$ )	0.9
Share of rule-of-thumb consumers ( $s$ )	0.4

---

---

**Initial Steady-State Ratios**


---

Czech Republic

Sectoral Shares as a Ratio to Nominal GDP	
tradables sector	54.5
non tradables sector	45.5
Labor Income Shares as a Ratio to Nominal GDO	50.91
tradables sector	27.74
non tradables sector	23.17
Consumption to Nominal GDP Ratio	49.6
forward looking	38.65
rule of thumb	10.96
Government consumption to Nominal GDP Ratio	24.2
Investment to Nominal GDP Ratio	26.19
domestic	9.28
imported	16.92
Exports to Nominal GDP Ratio	45
Imports to Nominal GDP Ratio	45
NFA to Nominal GDP Ratio	0
Real Interest Rate	3
Terms of Trade	1.17
Real Exchange Rate	0.92
CPI Inflation	2

---



---

**Initial Steady-State of Fiscal Variables**


---

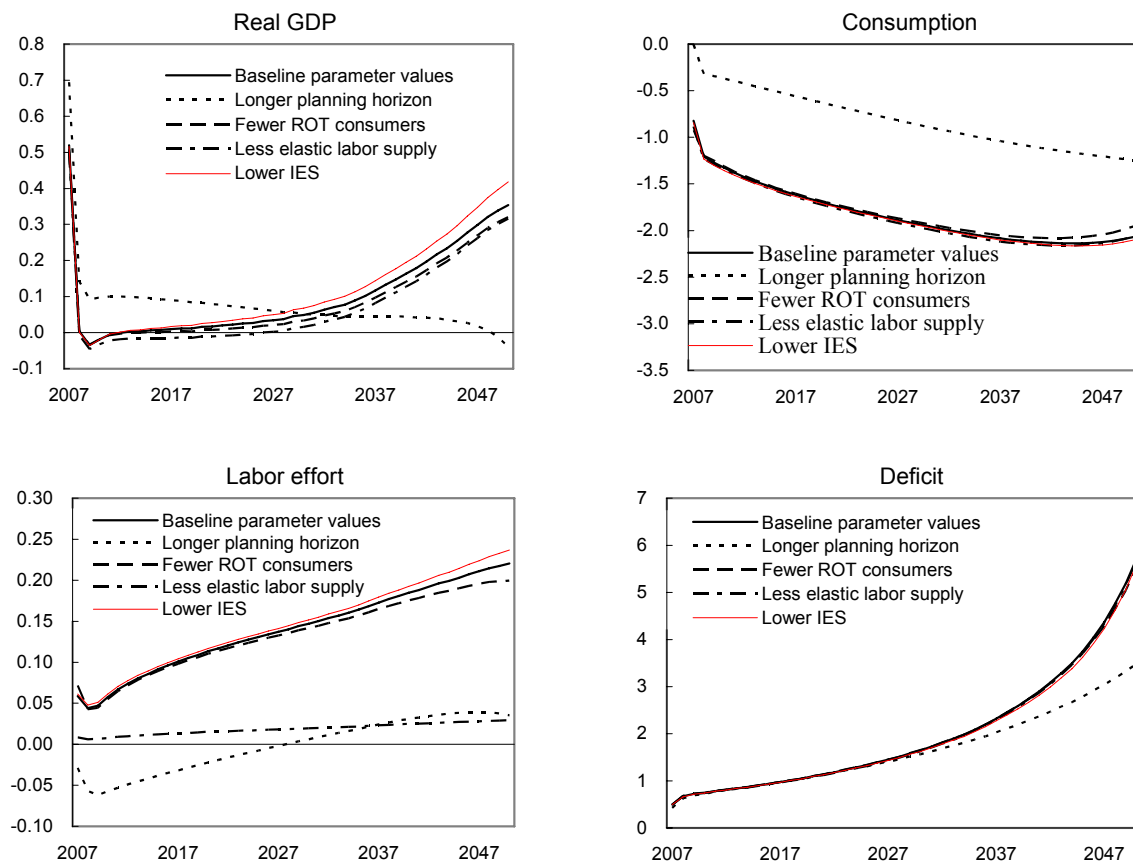
Government Debt to GDP	27.3
Tax Rates	
Corporate Income Tax Rate	20.4
as a percent of total income	4.3
Personal Income Tax Rate	6.18
as a percent of total income	4.34
Labor Income Tax Rate (employees)	8.69
as a percent of total income	3.61
Labor Income Tax Rate (employers)	25.76
as a percent of total income	10.4
VAT and excise tax	13.1
as a percent of total income	6.53
Transfer Rate as a Share of Income	7.75

---

## Appendix II. Sensitivity Analysis

**Sensitivity analysis shows that the conclusions are robust to alternative parameterization of the model.** If consumers had longer planning horizons (of 100 years instead of 10 years as assumed in the above simulations), they would lower consumption in anticipation of the longer run fiscal consolidation, increasing capital accumulation and longer run output gains. Similarly, if all consumers had complete access to capital markets, there would be less of an increase in consumption following the tax cuts, increasing savings and long run output. The more elastic the labor supply, the more distortionary would be raising social security contributions and VAT.

A 1. Sensitivity Analysis: Macroeconomic Effects of Tax Reform and Expenditure Restraint 1/  
(Deviation from baseline in percentage points)



Source: Staff calculations.

1/ Baseline parameters values are reported in Table 3. Alternative simulations consider: (i) longer planning horizon ( $q = 0.99$ ; 100 years); (ii) fewer rule-of-thumb consumers (10 percent of consumers); (iii) less elastic labor supply ( $\eta = 0.99$ ; almost completely inelastic labor supply); and (iv) a lower intertemporal elasticity of substitution ( $\rho = 0.25$ ). Results reported are deviations from the baseline with alternative parameter values.



### III. CHALLENGES TO MONETARY POLICY—AN INTEGRATED MONETARY AND FISCAL MODEL-BASED ANALYSIS<sup>55</sup>

114. **The economic environment for the conduct of monetary policy in the Czech Republic has changed significantly over the past year.** Until recently, demand-driven inflation had remained subdued despite acceleration in economic growth, and increases in regulated prices had been the main drivers of headline inflation. Moreover, continued robust productivity gains, wage moderation, a strong koruna, and an increasingly competitive retail environment were helping to keep underlying inflation at a low level. However, more recently, sources of growth have shifted toward domestic demand, fuelled by rising employment and real wages, rapid credit creation and a temporary cessation of the koruna appreciation.

115. **This chapter uses the IMF's *Global Integrated Monetary and Fiscal Model (GIMF)* to analyze monetary policy challenges lying ahead.** These challenges will be assessed on the backdrop of the changing context of rising inflation pressures, the impact of the recently-announced fiscal reform package and the planned reduction in the inflation target from 2010 onwards from 3 percent to 2 percent.

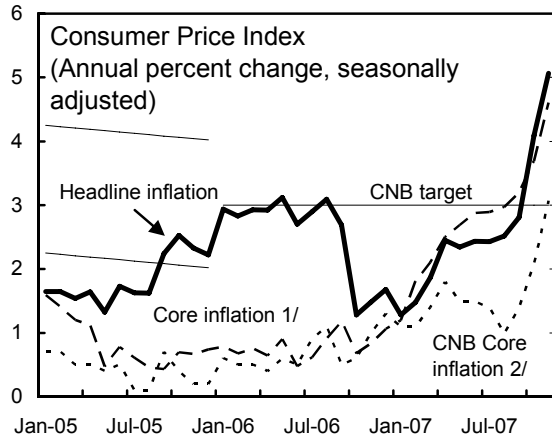
116. The chapter is structured as follows. Section A reviews the current environment facing the Czech National Bank (CNB) in the formulation and conduct of monetary policy. Section B provides a brief description of the GIMF model. Section C attempts to assess the monetary implications of the fiscal reform package, while section D examines the monetary effects of the remaining current macroeconomic challenges. Section E explores the implications of the reduction of the inflation target from 2010 onwards. Section F concludes.

#### A. Challenges for Monetary Policymaking

117. **Rising domestic demand pressures are increasingly reflected in core inflation.** Although increases in regulated prices and indirect taxes led to an increase in headline inflation in 2006, core inflation remained subdued most of the year, at around 1 percent. Since late 2006 however, core inflation has risen steadily, supported by strong domestic demand, particularly private consumption, and reached over 4½ percent in November 2007. The output gap is estimated to have turned positive in 2006 and to have increased steadily during 2007.

---

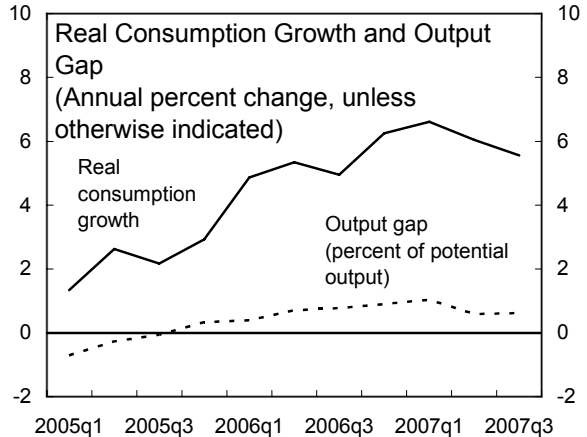
<sup>55</sup> Prepared by Céline Allard and Sònia Muñoz (EUR).



Source: Sources: Czech Statistical Office; Eurostat; and IMF staff estimates.

1/ Harmonized CPI excluding energy and seasonal food.

2/ Headline inflation excluding indirect tax changes, regulated prices, food and fuels.



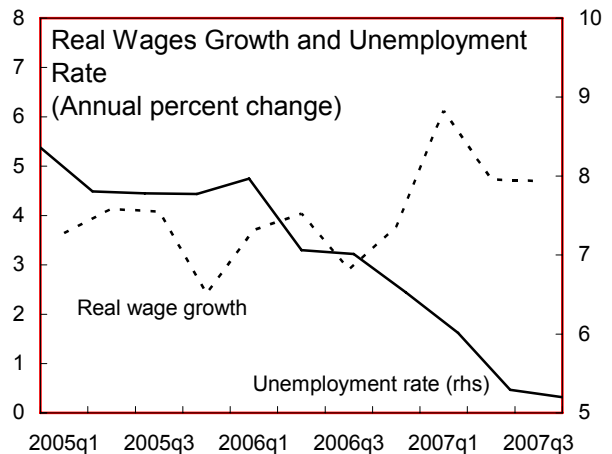
Source: Sources: Czech Statistical Office; and IMF staff estimates.

#### 118. Pressures on wages are emerging in the wake of declining unemployment.

Productivity gains exceeding nominal wage growth helped moderate inflation over the last few years. However, nominal and real wage growth picked up sharply, the latter reaching 6 percent in the first quarter of 2007. The acceleration reflected a tighter labor market, with the rate of unemployment reaching a record low level below 6 percent.

#### 119. Despite increasing immigration, labor shortages seem to be on the rise.

On the one hand, the number of foreign workers has been increasing since the beginning of 2005, mainly driven by strong demand of labor and GDP growth. Most of them are Slovaks (47 percent), Ukrainians (25 percent), and Poles (10 percent). Indeed, immigration of low-skill workers has soared.<sup>56</sup> But on the other hand, labor shortages are emerging in more skilled jobs in the IT and automotive sectors, reflecting growing skill mismatches. Shortages also exist in the construction sector. These scarcities are exacerbated by the fact that younger generations

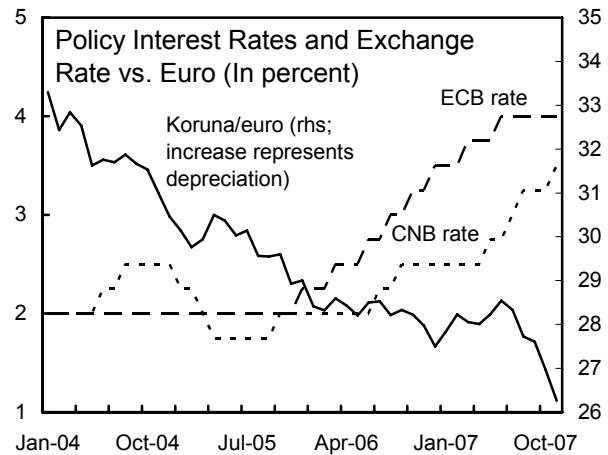


Source: Sources: Czech Statistical Office; and IMF staff estimates.

<sup>56</sup> This is particularly apparent for Ukrainian nationals while Slovaks can also get employment in skilled jobs, presumably due to the lack of a language barrier. See Šnobl (2007) for details.

exhibit lower labor participation rates and unemployment in neighboring countries has also been declining.

120. **The trend of koruna appreciation abated in the first half of the year.** The appreciation trend exhibited by the koruna over 2004-06 reversed in 2007, as the currency depreciated by 4 percent against the euro in the first half of the year. The use of the koruna as funding currency for carry trade operations explained most of this turnaround: as the European Central Bank (ECB) started tightening monetary policy from 2006 onwards, relatively low interest rates in the Czech Republic led investors to borrow in koruna to finance the purchase of debt instruments in higher-yielding currencies. The subsequent tightening by the CNB and the financial turmoil, arising from concerns over the US sub-prime mortgage market, resulted in the unwinding of the koruna carry trade by mid-August and the reversal of the depreciation. Toward the end of the year, the koruna was on the stronger side, appreciating by about 5 percent against the euro in about two months and posing a significant source of uncertainty for monetary policy.



Sources: Czech National Bank; and European Central Bank.

121. **The fiscal reform package approved by Parliament in August includes measures that will have direct impact on inflation.** The package includes the introduction of a 15 percent flat tax rate on personal income (PIT),<sup>57</sup> an increase of the lower value added tax (VAT) rate from 5 to 9 percent in 2008, a phased reduction in the corporate income tax (CIT) rate from 24 to 19 percent by 2010, and a cut in social spending by about 0.7 percent of GDP in 2008-10, as well as an increase in excises. The direct pass-through of VAT hikes to inflation could be compounded by second round effects in the current environment of rising demand-side inflation pressures. Conversely, the decline in both PIT and CIT rates could moderate price pressures.

122. **The CNB announced in March 2007 that it would lower its annual CPI inflation target from 3 to 2 percent effective January 2010.** Moreover, it announced that it would allow inflation to descend gradually to the new inflation target far enough in advance so that

<sup>57</sup> It is envisaged that the flat rate will be reduced to 12.5 percent in 2009, but these plans—and their financing—are uncertain and hence not considered in the analysis.

inflation is close to the new target by the date that the new target takes effect. However, at this stage, it has not provided a benchmark path envisaged to achieve the new target.

**123. Monetary policy will face additional challenges in the transition into the euro area.** The earlier target date of 2010 for euro adoption has been pushed back. Under the Convergence Program Update published in March and the updated Euro-area Accession Strategy adopted in August, the earliest date feasible would now be 2012, which implies that the Czech Republic would have to join ERM II in 2010. Given the tradeoff between exchange rate and price stability during the transition period in ERM II, major indirect tax hikes would complicate the CNB's task. Moreover, in the context of looming long-term spending pressures from population aging, delays in achieving substantial fiscal consolidation could also pose a threat to the fulfillment of the price stability criterion by generating additional demand pressures.

### **B. Brief Description of the Model**

**124. This paper attempts to exploit the features of GIMF, a multi-country non-Ricardian model, to evaluate jointly the impact of monetary and fiscal policies in the Czech Republic.** GIMF is a large scale version of the new open-economy macroeconomic models, with microeconomic foundations based on optimizing consumers and producers under sticky prices, real and nominal rigidities as well as monopolistic competition.<sup>58</sup> Agents are forward-looking but non-Ricardian. Fiscal policy is countercyclical and the monetary policy reaction reflects the inflation targeting regime in place in the Czech Republic.<sup>59</sup> These features allow for the analysis of both monetary business cycles and the medium and long term effects of fiscal policies on inflation (Kumhof and Laxton, 2007b). We used here a two-country version of the model, where the “home” country is the Czech Republic, and the “rest of the world” is represented by the euro area. Because we are particularly interested in assessing monetary policy reactions to shocks, we relied on a quarterly version of the model.

**125. The calibration is based on data averages for the past decade consistent with impulse responses of the model.**<sup>60</sup> Because GIMF is a general equilibrium model, its steady state needs to be calibrated before any shock can be run to assess the impact of various policies. To that effect, the steady state GDP ratios and other macroeconomic variables are

---

<sup>58</sup> A full description of the theoretical underpinnings of the model can be found in Kumhof and Laxton, 2007a.

<sup>59</sup> GIMF reproduces the features of an earlier model developed by the IMF, the Global Economy Model (GEM) but adds to it a full-fledged fiscal policy, which allows for the joint evaluation of monetary and fiscal policies. GEM has already been applied to the Czech Republic to assess the effectiveness of Taylor rules and inflation-forecast-based rules in stabilizing variability in output and inflation (Laxton and Pesenti, 2003) and the monetary policy implications of capital account volatility (Karam, Laxton, and Tamirisa, 2005), but this study is the first application of GIMF to the Czech Republic.

<sup>60</sup> Appendix I lists the variables used for the calibration and their value.

derived from the national accounts averaged over 1995-2005/6 (latest observation for the fiscal ratios); while structural parameters are largely adapted from the literature on Czech Republic (Laxton and Pesenti, 2003), and Western Europe or the United States (Bayoumi, Laxton, and Pesenti, 2004 and Everaert and Schule, 2006), or Chile (Kumhof and Laxton, 2007c), when no such parameters have yet been estimated for the Czech Republic.

**126. The government’s tax and expenditure decisions affect the country’s public sector balance and debt.** In the model, the government collects taxes on consumption, labor and capital as well as lump sum taxes, and spends on both public consumption and investment, as well as on transfers to households. During the period of study, the fiscal parameters—tax rates and the level of public expenditures—are set exogenously, therefore allowing for automatic stabilizers. Long term stability is ensured through a government-set budget balance target that stabilizes debt to GDP, a stability requirement for the model to converge. However, given our focus on the short to medium-run impact of the fiscal package, the period after which the sustainability criterion kicks in has been pushed to beyond the horizon of interest here.

**127. The CNB credibly targets an inflation rate of 3 percent.** The monetary policy reacts to any deviation to the 3 percent target by adjusting nominal interest rates. The sacrifice ratio—how much GDP is lost when inflation is lowered by 1 percentage point—hovers around 1.5, as opposed to 1.1 in earlier calibrations of the Czech Republic using GEM, but still below the level of the euro area at 2.1 (Laxton and Pesenti, 2003). This result should not be surprising: during the initial period of disinflation, inflation was transitorily decelerating without excessive output loss. Now that the disinflation process is more advanced, the sacrifice ratio has naturally risen closer to levels seen in Western Europe. The credibility of the CNB is assumed to guarantee that all economic agents incorporate this target in their forward-looking behavior.<sup>61</sup>

---

<sup>61</sup> The monetary policy rule is set consistent with the Czech FPAS (Beneš and others, 2003). The interest rate smoothing coefficient value is set at  $\mu_i = 0.75$ , the response to the inflation forecast gap is  $\mu_\pi = 1.4$ , and the response to output growth features  $\mu_{gdp} = 0.4$ . (We use output growth instead of output gap in the Inflation-Forecast Based rule because the level of potential output is dependent on fiscal policy while the output gap in the GIMF model is derived from the steady state and therefore does not reflect tax rate changes). Regarding the Euro area we use the ECB parameters ( $\mu_i = 0.5$ ;  $\mu_\pi = 2$ ;  $\mu_{gdp} = 0.5$ ).

### C. Impact of the Fiscal Package

128. **This section analyses the effects of the fiscal package focusing on the changes in the PIT, VAT, CIT rates, and the announced decline in social spending.**<sup>62</sup> We assume that the fiscal package would get implemented starting in the first quarter of 2008, but that, since it has already been announced, agents would begin adjusting their behavior and expectations as early as 2007. The increase in the lower VAT rate by 4 percentage points—from 5 to 9 percent—is assumed to raise the effective VAT tax rate by 1.1 percentage point, as these goods weigh 28 percent in the consumption basket; the introduction of the flat PIT would imply that the effective rate decreases by 1.1 percentage point while the gradual CIT reform would generate a decline in the tax rate by 1.2 percentage points in 2008 and by an additional 0.4 percentage point in 2009 and 2010.<sup>63</sup> Moreover, we retain the authorities' original assumption that social transfers to households would be cut by 0.6, 0.7, and 0.8 percentage point of pre-shock GDP in 2008, 2009, and 2010 respectively.<sup>64</sup>

129. **The first round effects of the VAT hike could push headline inflation by about 1 percentage point.**<sup>65</sup> Because we did not assume any special margin behavior from retailers, headline inflation would be impacted one-to-one by the increase in the lower VAT rate. However, the direct price effect could be spread over a more protracted period if retailers temporarily squeeze their margin to smooth the price increases, as has recently been witnessed in Germany where VAT rates were hiked in January 2007 (Carare and Danninger, 2007). The impact could even be minimized by the existence of low-cost, high-efficiency international retailers, the so-called “Wal-Mart Effect” (Igan and Suzuki, 2007).

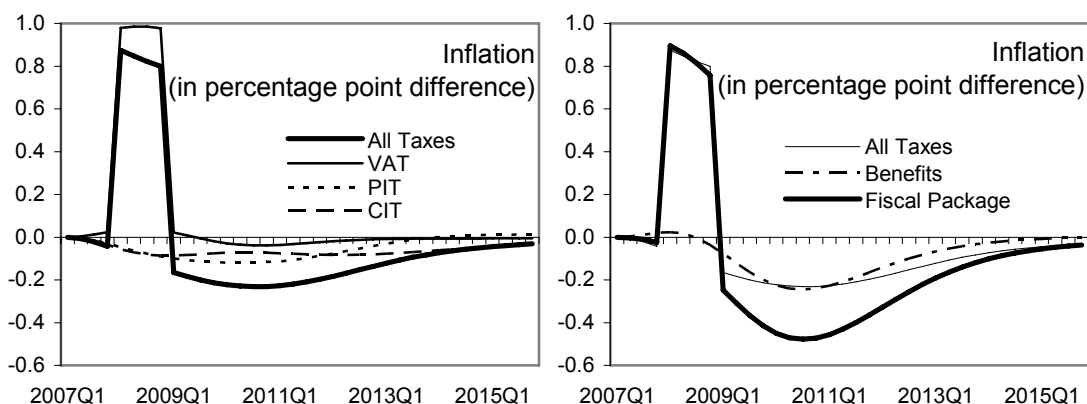
---

<sup>62</sup> The fiscal package also include increases in excises that are not considered in this analysis. See *Selected Issues* paper on “Tax and Welfare Reform in the Czech Republic—Structural Implications and Challenges.”

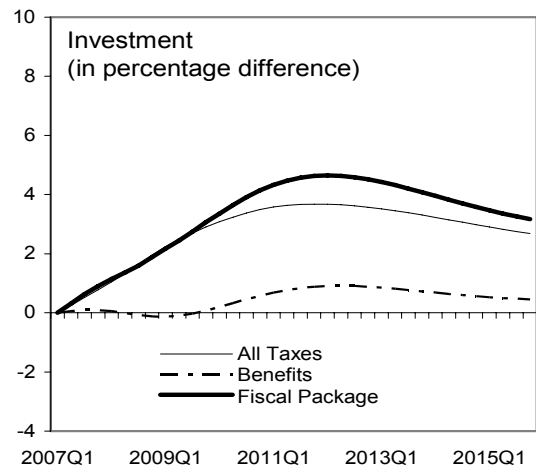
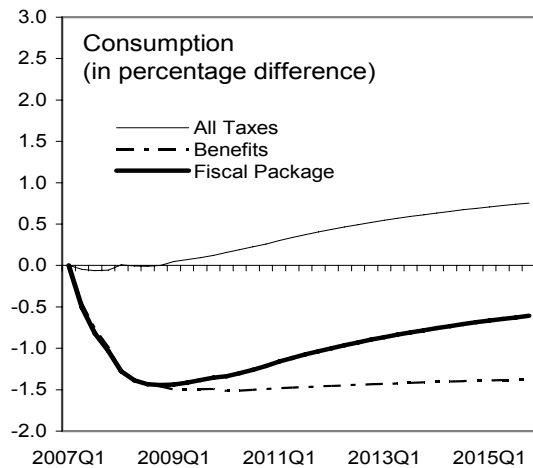
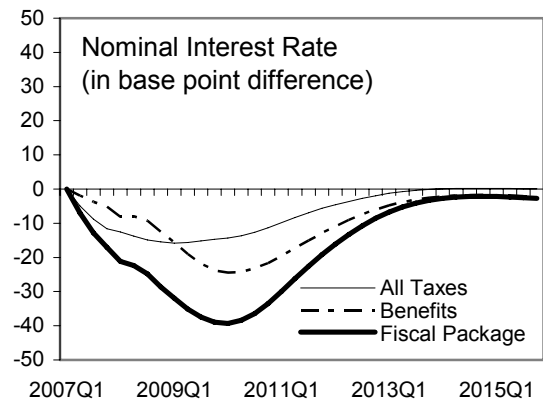
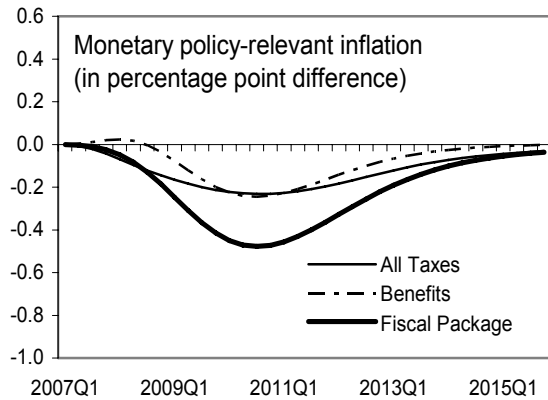
<sup>63</sup> Given that CIT payments made in the second half of the year and the first half of the following year depend upon the tax liability in the previous year(s) and the amount of over/under payment when the tax payment is settled in the middle of the year, the tax rebate effect would be mainly felt the following year.

<sup>64</sup> For the sake of the exercise, we assume that tax rates do not change after the reform and benefit cuts are permanent.

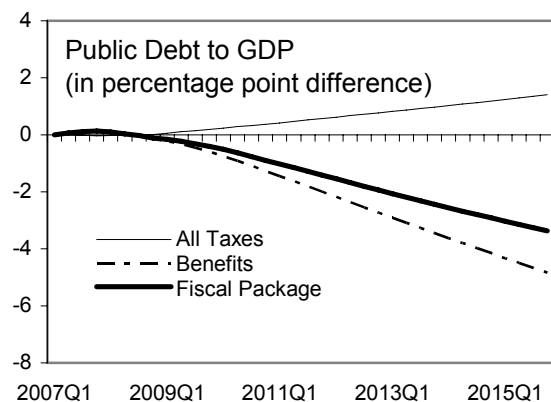
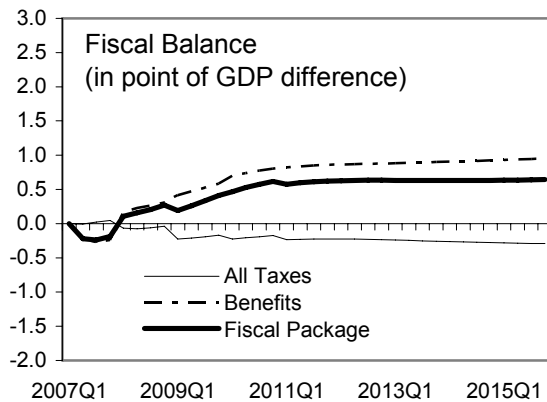
<sup>65</sup> First round effects are included in the headline inflation shown in the graphs. However, they are not included in the inflation indicator taken into account by monetary policy and therefore in the rest of the figures that follow.



130. **If the fiscal measures are implemented as originally announced, the model suggests that supply-side effects are likely to dominate demand-side effects, dampening inflationary pressures.** Monetary policy-relevant inflation (inflation excluding the first-round effects of indirect taxes, to which monetary policy is not mandated to react) will decrease by about 0.5 percentage point over the next two to three years and will allow a fall in nominal interest rate, estimated at 40 basis points in GIMF. In fact, the tax cuts would boost supply, both through a lift in investment of up to 5 percent over the next three years (see Appendix Figure 1b) due to the CIT cut, and through an increase in labor supply coming from the PIT cut. Moreover, the PIT cuts, by increasing households' take-home pay will moderate wage increases since unions are more willing to accept less favorable gross wage raises. Household demand pressures triggered by the cut in PIT would be more than offset by the dampening effect of the VAT hike. The ensuing slowdown in consumption would be compounded by the decrease in social expenditures. One caveat to bear in mind is that households are expected in the model to refrain from demanding wage hikes following the hike in VAT, because they fully anticipate that real income gains cannot be derived as the central bank ensures that the inflation target is met. To the extent that this assumption does not hold, the risk is that second round effects could start to emerge. It also must be kept in mind that the model does not capture the distributional impact of tax cuts and hence their impact on the aggregate propensity to consume and the timing and strength of supply effects.

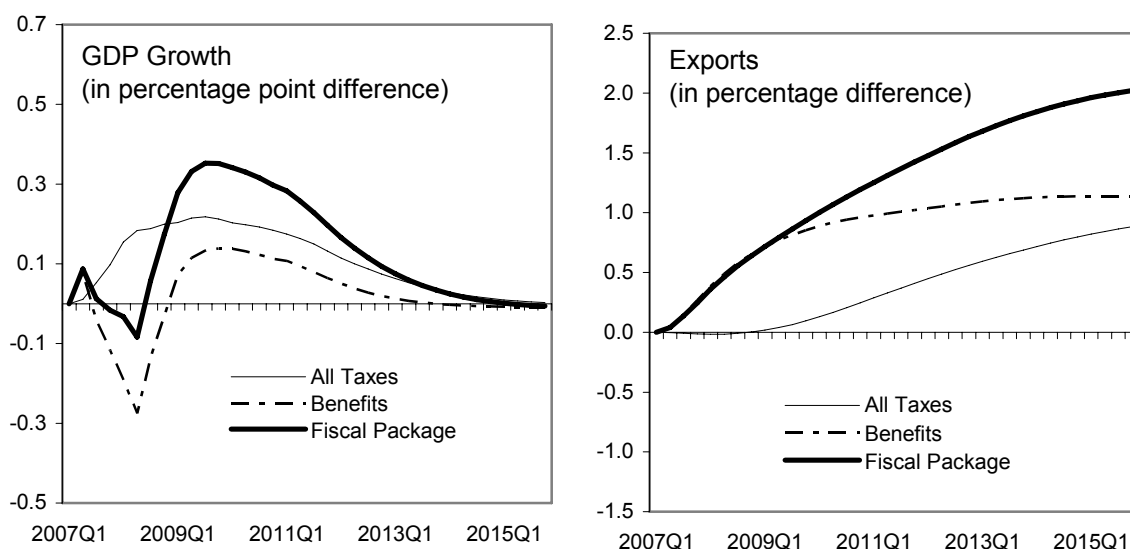


131. **This exercise is consistent with the authorities' estimation that the fiscal package would be broadly neutral in its effects on the fiscal balance.** The reduction in social expenditures would in fact more than compensate for the loss in tax revenues. The fiscal balance would improve by  $\frac{1}{2}$  percentage point of GDP over the whole period but would fall short of any significant fiscal consolidation.





132. **The fiscal package would also be moderately expansionary.** Annual growth could be spurred by over  $\frac{1}{4}$  percentage point in 2009-10. Besides boosting investment through the cut in corporate income tax, the fiscal package would also spur labor participation as social transfers are curtailed and personal income taxes cut. In addition, the combination of a negative consumption demand shock and a positive supply shock would lead to a  $\frac{1}{2}$  percentage koruna depreciation, thereby boosting net exports. These effects would more than offset the dampening impact of the package on private consumption.

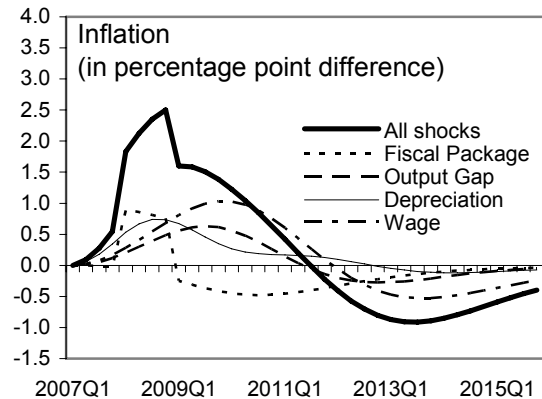


#### D. Prospects for Monetary Policy in the Period Ahead

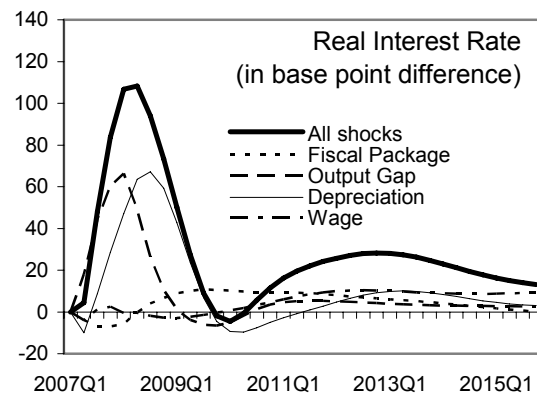
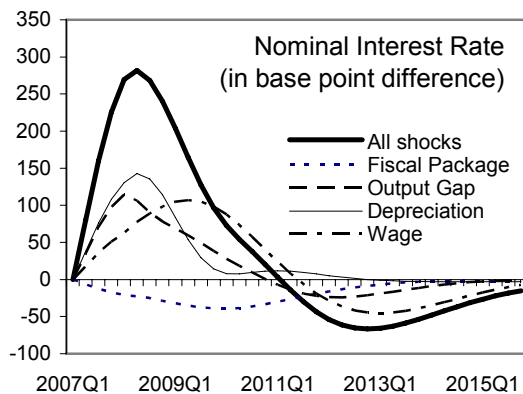
133. **Apart from any impact of the fiscal package, formulation of monetary policy would need to also take account of the positive output gap, wage trends, and the course of the exchange rate.** To that effect, we looked at the additional impact on the economy of a positive output gap of about  $\frac{1}{2}$  percent (triggered by a temporary boost in consumption) and of an increase in wages of about  $1\frac{1}{2}$  percentage points generated by the current labor shortages. Moreover, we simulated a depreciation of the koruna by 2 percent in 2008, a range that is consistent with carry trade movements observed in 2007, given the uncertainty in the behavior of the exchange rate.<sup>66</sup> These factors have been examined on top of the fiscal package shock to assess the full burden that could fall on monetary policy in the near future.

<sup>66</sup> Technically, the output gap shock is engineered through a temporary decrease in the households' discount factor: with a lower rate of time preference, households get more impatient and bring forward their consumption. The wage increase follows a temporary decline in the elasticity of substitution between the different type of labor provided: such a shock enhances the bargaining power of unions, who can then secure higher wages. The carry trade depreciation follows a hike in the foreign exchange risk premium of the Czech currency, which triggers de facto increase in the foreign nominal interest rate relative to the domestic one.

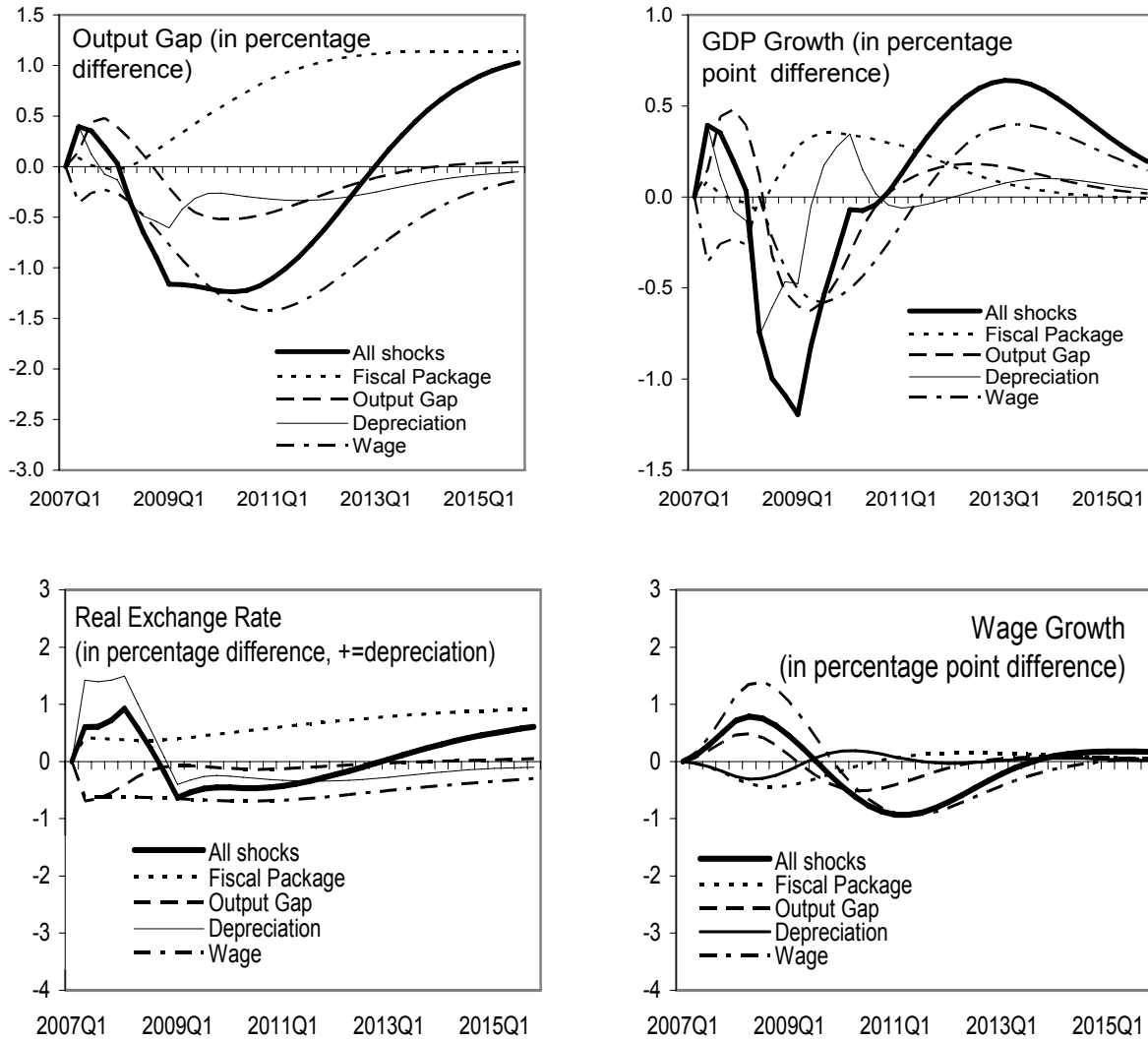
134. **The various shocks add up to substantial inflation pressures.** Overall inflation could be boosted by as much as 2½ percentage points above the target during 2008, out of which only 1 percentage point derives directly from the VAT hike. Koruna depreciation would generate close to ¾ percentage point additional inflation, as imports would become more expensive. An appreciation would have the opposite result. The positive output gap and wage increases impact inflation more gradually—through higher demand pressures and higher production costs, but each would still contribute ½ percentage point in 2008.



135. **To counteract the projected pick-up in inflation, monetary policy would need to be significantly tightened.** While, as mentioned earlier, the reaction of monetary policy to the fiscal package would be muted because the monetary authorities would not react to the increase in indirect taxes, the reaction to each of the other shock would range from 100 to 150 basis points in 2008, with an overall hike of as much as 250 basis points. This sharp tightening would successfully curb inflation over 2009-10, with a return to target in 2011, but at the cost of a rise in real interest rate of close to 100 basis points at its pick.



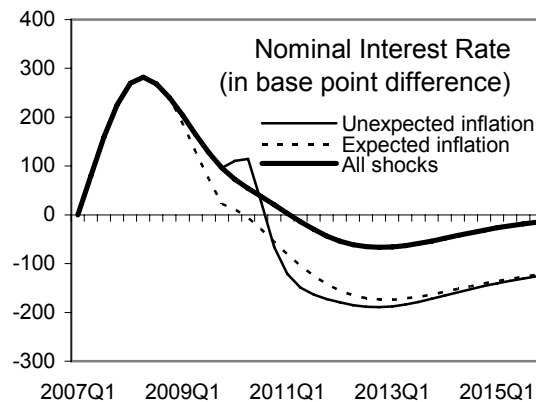
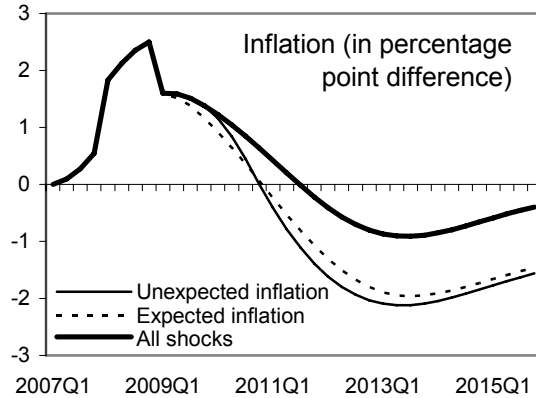
136. **The monetary tightening would also trigger a sharp reversal in the cycle by the end of the decade.** While the temporary boost in consumption and wages would abate, the delayed effects of the monetary tightening would be felt throughout 2010, sending the output gap into negative territory by the end of the decade. The wage shock would be particularly detrimental to activity, as it would reduce corporate profitability. The real appreciation of the exchange rate and ensuing loss in competitiveness would further dampen growth. Following the correction, wages would adjust downwards, further reducing consumption.



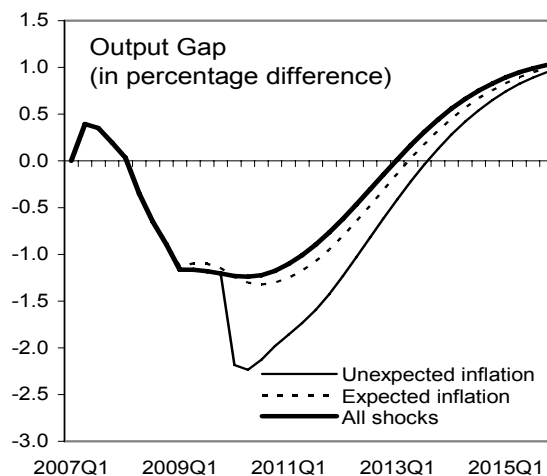
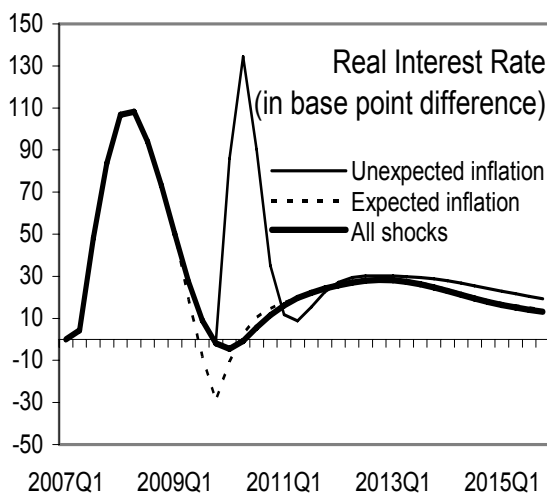
### E. Effects of Reducing the Target Rate of Inflation

137. **The intention to lower its inflation target to 2 percent would also affect the conduct of monetary policy.** The CNB has announced that the target would be lowered from 3 to 2 percent from January 2010 onwards. A lot will depend on how agents incorporate this news in their behavior. If they consider the CNB fully credible in that move, they would adjust their expectations automatically. Otherwise, the CNB may have to initially push inflation down sharply for economic agents to fully believe in the lower target. Whether the first or second scenario prevails would have a very different impact on the adjustment costs.

138. **If not fully anticipated by households, the permanent reduction in the inflation target in 2010 could have significant adverse impact on the real economy.** A scenario where households would only start to adjust their expectations at the time the new target is in place (“unexpected inflation” in the figures), the model suggests that stickiness in the inflation adjustment might require an increase in the nominal interest rate of 75 basis points, on top of the earlier hikes discussed in the previous section. Furthermore, with inflation falling, real interest rates would skyrocket, resulting in a further deterioration of the output gap by some 1½ percentage points: Investment would be further hit, while the real exchange rate appreciation deriving from lower domestic inflation would weigh on exports.



139. **However, if the public incorporates the reduction in the inflation target in their behavior fully in advance, the real effects will be negligible—highlighting the critical importance of communication from the CNB early on.** That scenario, reflected under the heading “expected inflation” in the figures, would require no action from the monetary policy authorities, and in fact, inflation would start adjusting downwards as early as 2009. But such a scenario will require that the communication strategy of the CNB be fully successful.



## F. Conclusions

140. **An assessment based on the model suggests that the fiscal package by itself does not put pressure on inflation, excluding first-round tax effects, but it does not help monetary policy to cool down the other shocks affecting the economy.** Although the fiscal package is relatively neutral on monetary policy-relevant inflation—that is, excluding the first-round effects of the VAT hike—, it still runs the risk of putting additional pressure on prices in the context of resource constraints, and a tightening labor market. A further reduction on the fiscal deficit will go a long way in easing the task of monetary policy of keeping inflation within target in an environment of demand-driven pressures.

141. **Monetary policy may have to tighten again if the reduction in the inflation target in 2010 is not fully incorporated in the public behavior and inflation is above the target at that time.** Strengthening the CNB’s communication strategy will help avoid short-run negative effects on the real economy and quickly anchor expectations to the new target.

142. **Fiscal policy will need to play a greater supportive role to monetary policy on the route to euro adoption.** Inflation pressures in the medium term are likely to require monetary tightening. However, nominal convergence with the euro area will make it more difficult to ensure that the price stability criterion is fulfilled by means of monetary policy alone.

## References

- Bayoumi T., D. Laxton, and P. Pesenti, 2004, “Benefits and Spillovers of Greater Competition in Europe: A Macroeconomic Assessment,” ECB Working Paper No. 341.
- Beneš, J., T. Hlédik, D. Vávra and J. Vlček, 2003, “The Quarterly Projection Model and its Properties” in *The Czech National Bank’s Forecasting and Policy Analysis System*, ed. by W. Coats, D. Laxton and D. Rose (Prague: Czech National Bank).
- Carare, A. and S. Danninger, 2007, “Inflation Smoothing, Competition, and Rent Extraction,” mimeo (Washington: International Monetary Fund).
- Everaert L. and W. Schule, 2006, “Structural Reforms in the Euro Area: Economic Impact and Role of Synchronization Across Markets and Countries,” IMF Working Paper No. 137 (Washington: International Monetary Fund).
- Igan, D. and J. Suzuki, 2007, ““Wal-Mart Effect” in Central and Eastern Europe: What Does it Imply for Czech Inflation?,” mimeo (Washington: International Monetary Fund).
- Karam, P., D. Laxton, and N. Tamirisa, 2005, “Monetary Policy Implications of Capital Account Volatility under an Inflation Targeting Regime,” IMF Country Report No. 275 (Washington: International Monetary Fund).
- Kumhof, M. and D. Laxton, 2007a, “A Party without a Hangover? On the Effects of U.S. Government Deficits,” IMF Working Paper No. 202 (Washington: International Monetary Fund).
- Kumhof, M. and D. Laxton, 2007b, “The Global Integrated Monetary and Fiscal Model (GIMF),” mimeo (Washington: International Monetary Fund).
- Kumhof, M. and D. Laxton, 2007c, “Chile’s Structural Fiscal Surplus Rule: A Model-Based Evaluation,” Chile—Selected Issues Paper, SM/07/221 (Washington: International Monetary Fund).
- Laxton, D. and P. Pesenti, 2003, “Monetary Rules for Small, Open, Emerging Economies,” *Journal of Monetary Economics*, No. 50, pp. 1109-1146.
- Šnobl, R., 2007, “International Labour Mobility”, mimeo (Prague: Czech National Bank).

## APPENDIX I: CALIBRATION PARAMETERS

	Czech Republic	Euro Area
<b>Ratios to GDP</b>		
Labor Income Share		
In Total Economy	52.8	59.1
In Non Tradable Sector	55.6	63.9
Investment Share	28.0	18.8
Exports of Final Goods	22.4	-
Exports of Intermediate Goods	33.2	-
Imports of Final Goods	22.1	-
Non Tradable Production	61.6	71.1
Net Financial Asset Position	-15.9	-
<b>Fiscal And Monetary Parameters</b>		
	(in percent of GDP)	
Government Expenditures	25.9	22.2
Government Consumption	19.8	19.6
Government Investment	6.1	2.6
Government Social Transfers	20.9	25.1
Government Debt	30.4	70.6
	(in percent)	
Share In Total Revenue of ... 1/		
Consumption Tax	21.8	24.1
Capital Tax	10.5	7.0
Labor Tax	25.4	24.5
Lump-Sum Tax	42.3	44.4
Share of Cyclical Revenue Saved 2/	100.0	100.0
Inflation Target (annual)	3.0	2.0
	(in level)	
Coefficients In The Monetary Policy Reaction Function		
Lagged Nominal Interest Rate	0.75	0.5
Inflation	1.4	2.0
GDP Growth	0.4	0.5
Output-Gap	0.0	0.0
Exchange Rate	0.0	0.0

1/ These ratios were calibrated to yield average effective tax rates observed in the Czech Republic and the euro area.

2/ This corresponds to a fiscal rule that stabilizes the structural fiscal balance.

	Czech Republic	Euro Area
<b>Households' parameters</b>		
Share of Liquidity Constrained Consumers	0.5	0.35
Population Growth Rate (annual)	0.75	0.75
Population Ratio	1	30.8
Habit Persistence	0.7	0.7
Probability of Surviving (quarterly) 1/	0.989	0.989
Income Decline Rate (quarterly) 2/	0.98125	0.98125
Coefficient of Relative Risk Aversion	5	5
<b>Rigidities And Competition Parameters</b>		
Price Adjustment Costs (quarterly)	350	350
Unions	350	350
Distributors	350	350
Non Tradable Sector	350	350
Tradable Sector	350	350
Imported Final Goods	100	100
Imports Intermediary Goods	100	100
Quantity Adjustment Costs		
Retail Sector	2	2
Trade Flows of Final Goods	1	1
Trade Flows of Intermediary Goods	1	1
Capital Stock	0	0
Investment	10	10
Elasticities Of substitution Between Varieties 3/		
Non tradable Sector	11	11
Tradable Sector	11	11
Retail Sector	21	21
Distribution Sector	21	21
Unions	11	11
Importers of Final Goods	41	41
Importers of intermediary Goods	41	41

1/ Corresponds to a 50 percent probability of surviving 15 years

2/ This parameter captures the decline in revenue at the end of the life cycle

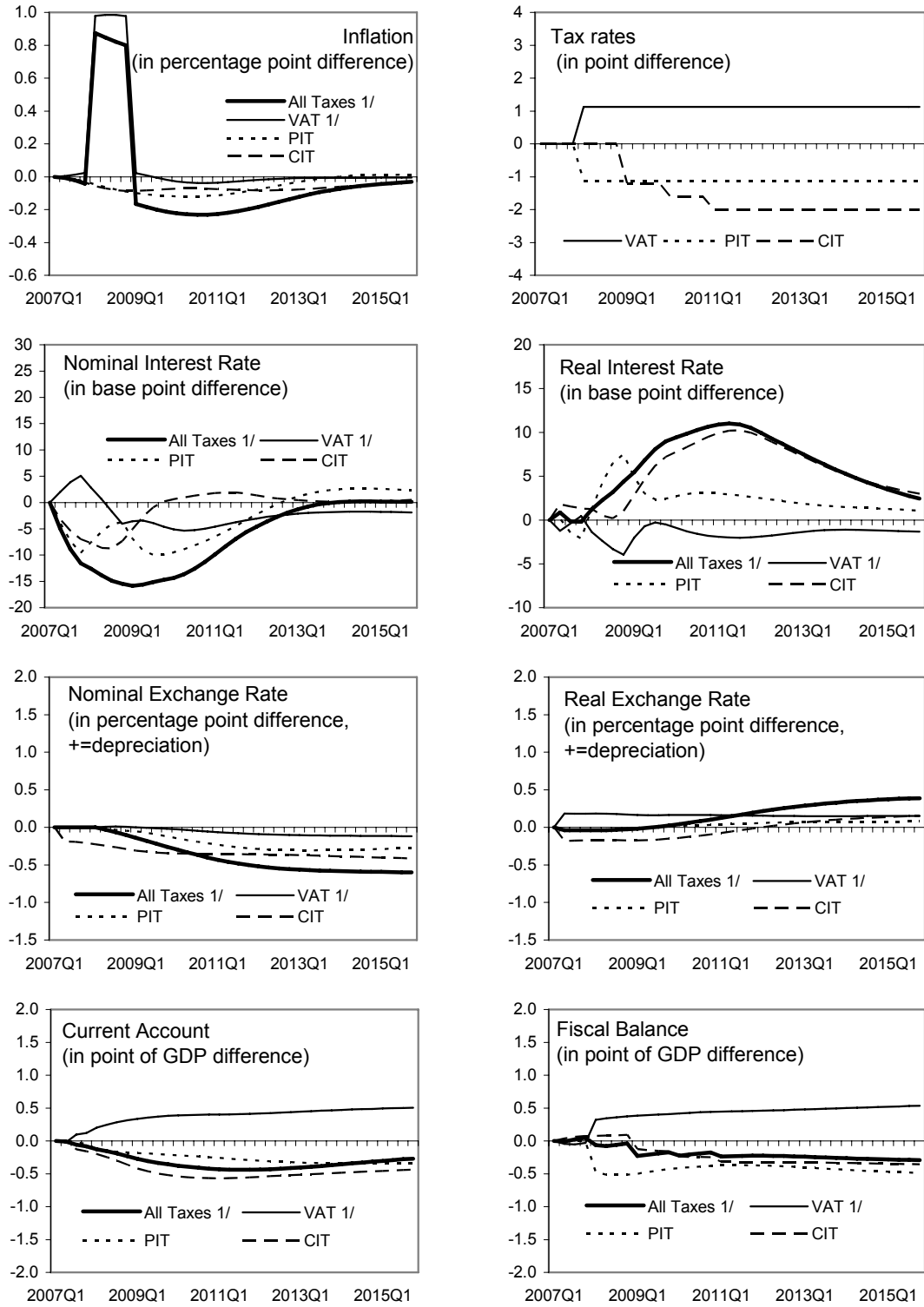
3/ The larger the elasticity (s) the smaller the market power of agents, and the lower the mark-up of prices charged over marginal costs ( $s/(s-1)$ ). An elasticity of 11 corresponds to a mark-up of 10 percent, an elasticity of 41 to a mark-up of 2.5 percent.



	Czech Republic	Euro Area
<b>Production parameters</b>		
	(in percent)	
Real Growth Rate (annual)	-	2.0
Real Interest Rate (annual)	-	2.2
Depreciation Rates of... (annual)		
Private Capital Stock	10	10
Public Capital Stock	4	4
Public Consumption Stock	4	4
	(in level)	
Elasticity of GDP to ...		
Public Capital Stock 1/	0.1	0.1
Public Consumption Stock 1/	0.01	0.01
Elasticity of Substitution Between ...		
Private Output and Public Capital	1.5	1.5
Domestic and Foreign Goods	1.5	1.5
Labor and Capital in the Tradable Sector	0.99	0.99
Labor and Capital in the Non Tradable Sector	0.99	0.99
Domestic Tradable and Non Tradable Goods	0.8	0.8
Foreign Intermediary Goods from Different Countries	0.75	0.75
Foreign Final Goods from Different Countries	0.75	0.75

1/ A 10 percent rise in public capital (resp. consumption) stock would increase GDP by 1 (resp. 0.1) percent.

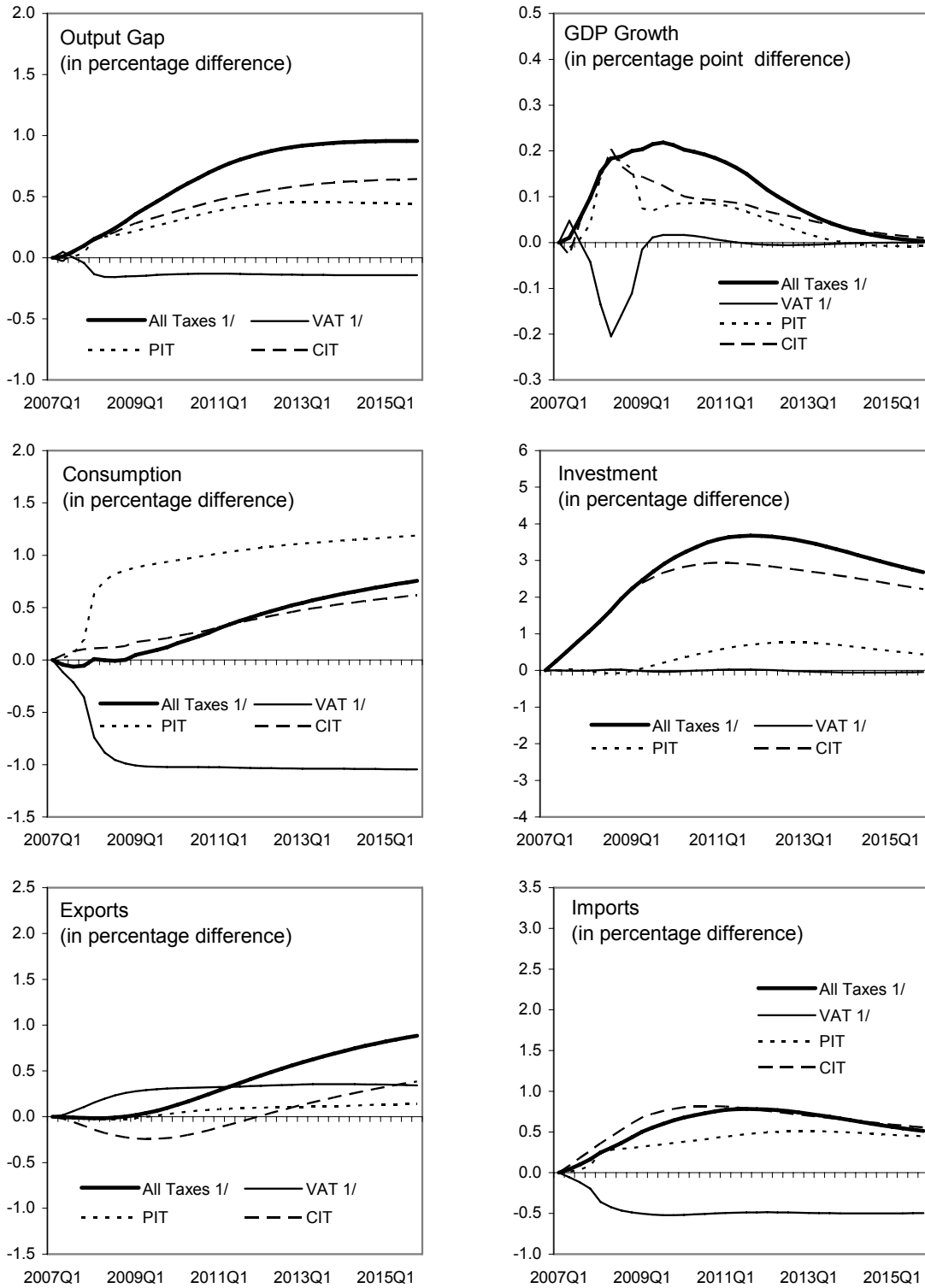
Appendix Figure 1a. Czech Republic: Tax shocks, 2007-15



Source: IMF staff estimates.

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

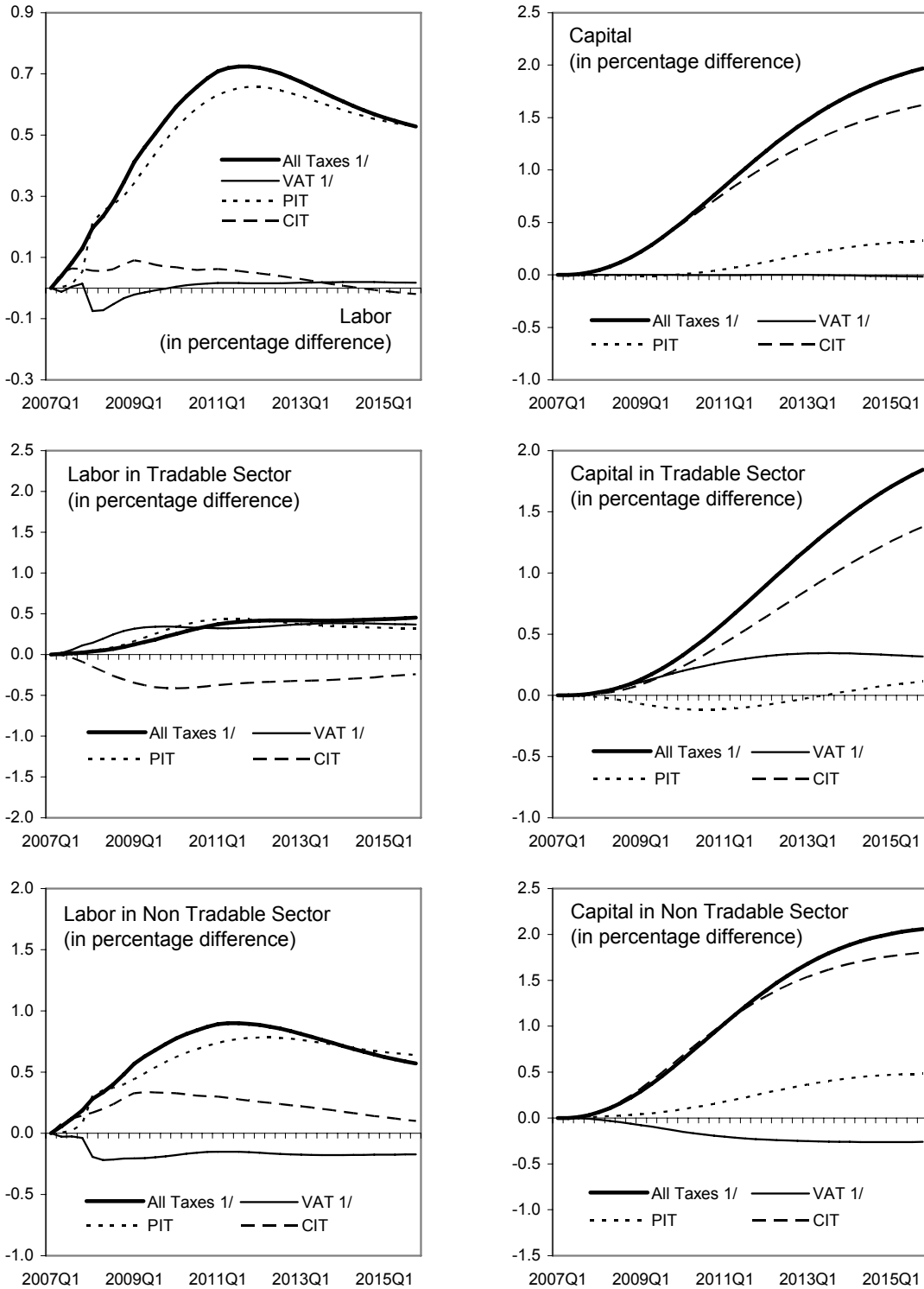
Appendix Figure 1b . Czech Republic: Tax shocks, 2007-15



Source: IMF staff estimates.

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

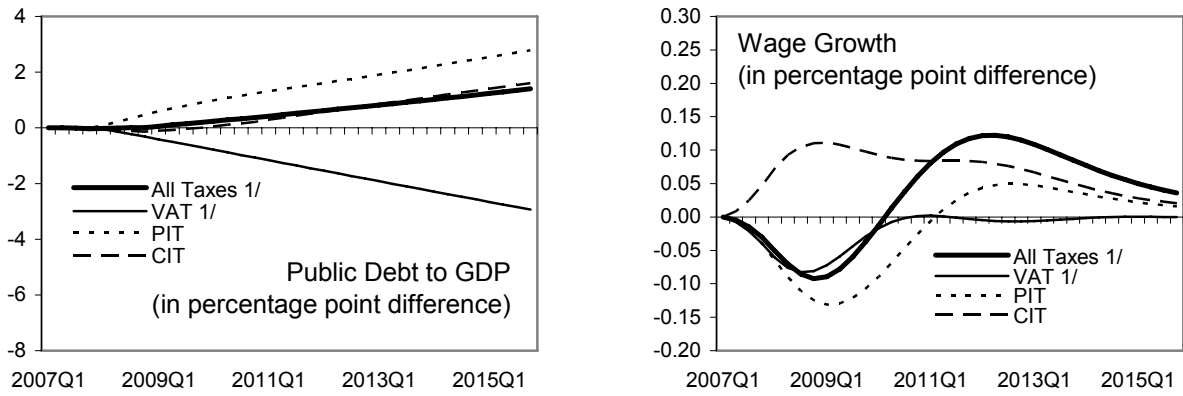
Appendix Figure 1c. Czech Republic: Tax shocks, 2007-15



Source: IMF staff estimates.

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

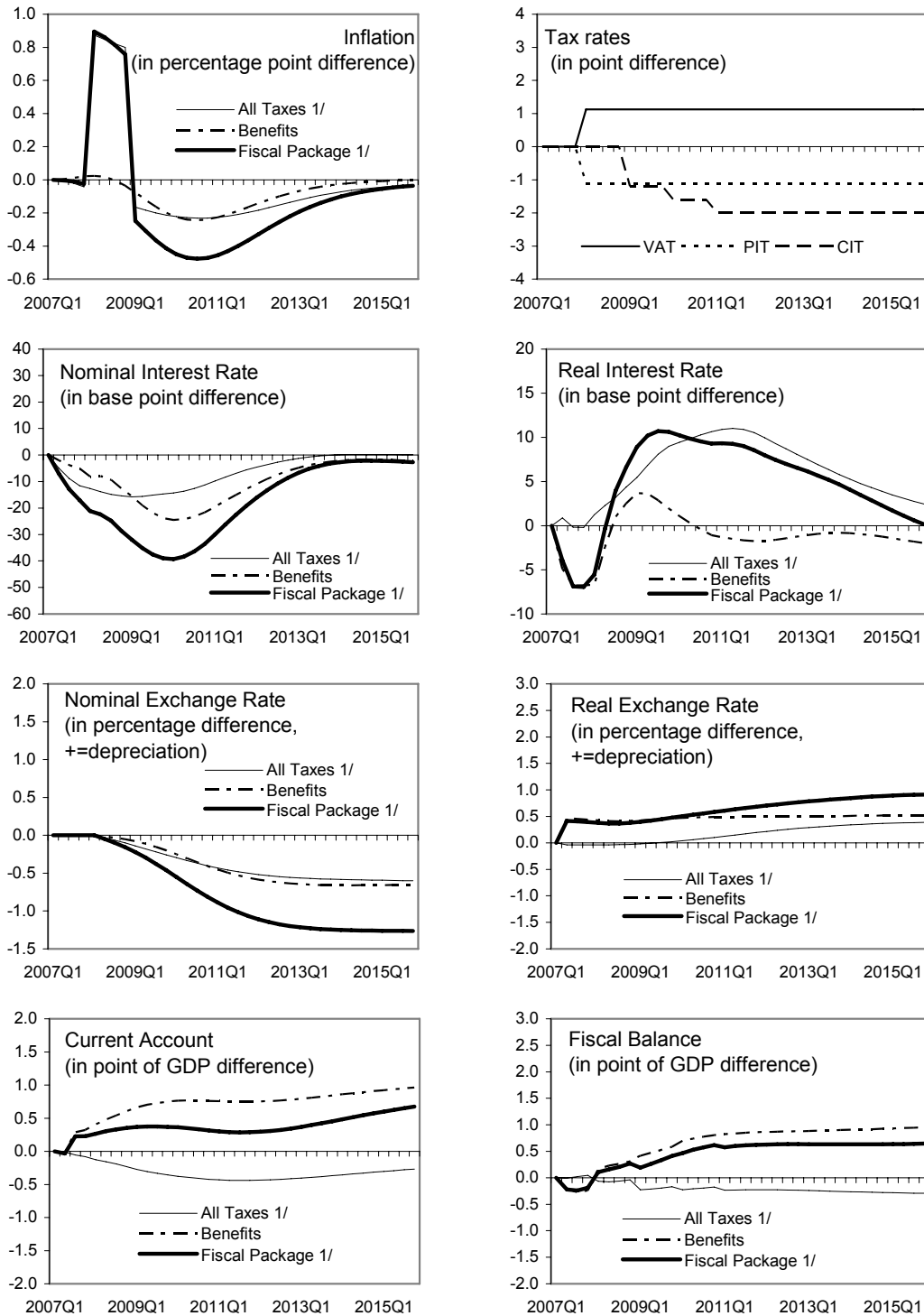
Appendix Figure 1d . Czech Republic: Tax shocks, 2007-15



Source: IMF staff estimates.

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

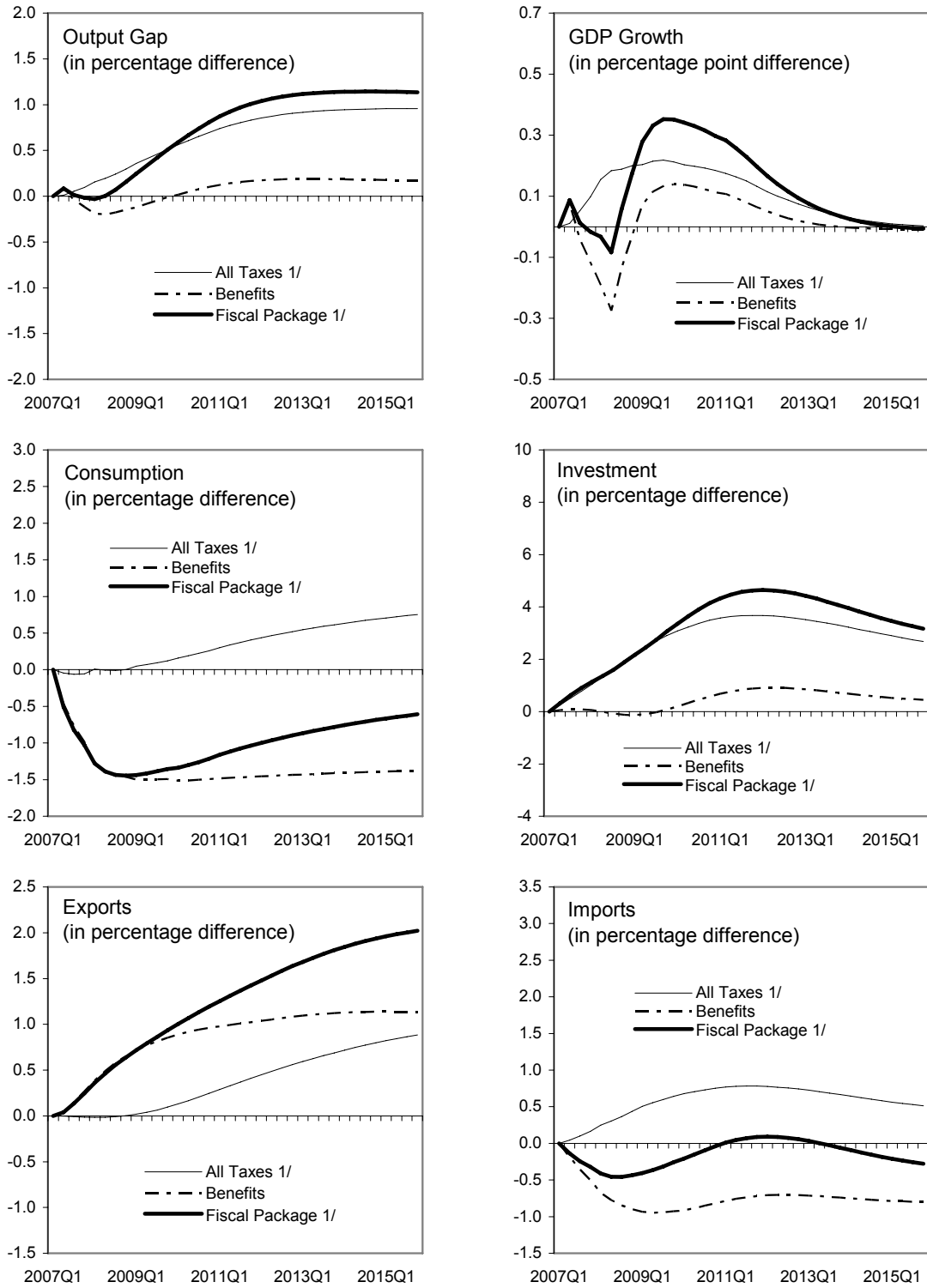
Appendix Figure 2a . Czech Republic: Fiscal shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

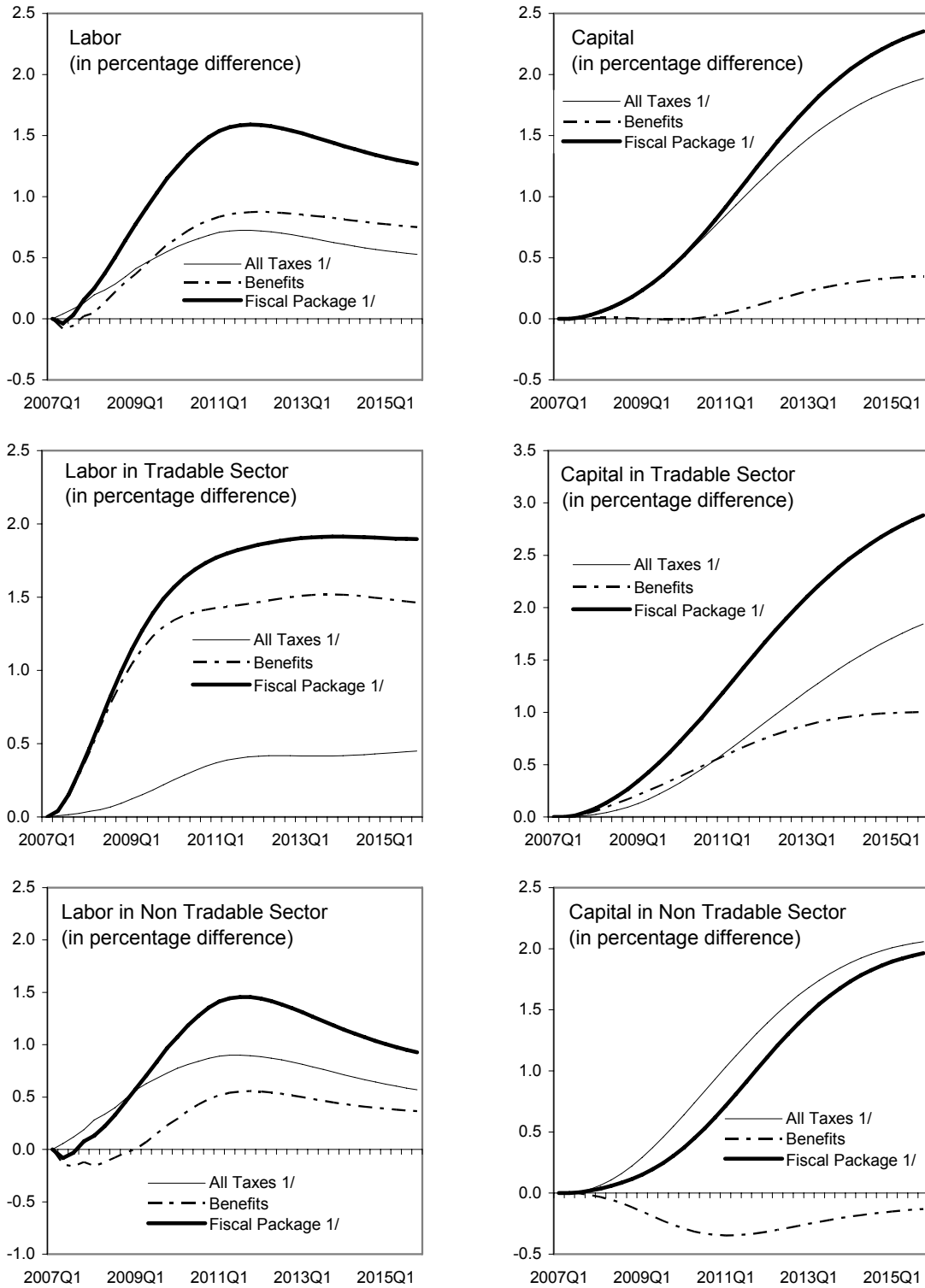
Appendix Figure 2b. Czech Republic: Fiscal shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

Appendix Figure 2c. Czech Republic: Fiscal shocks, 2007-15

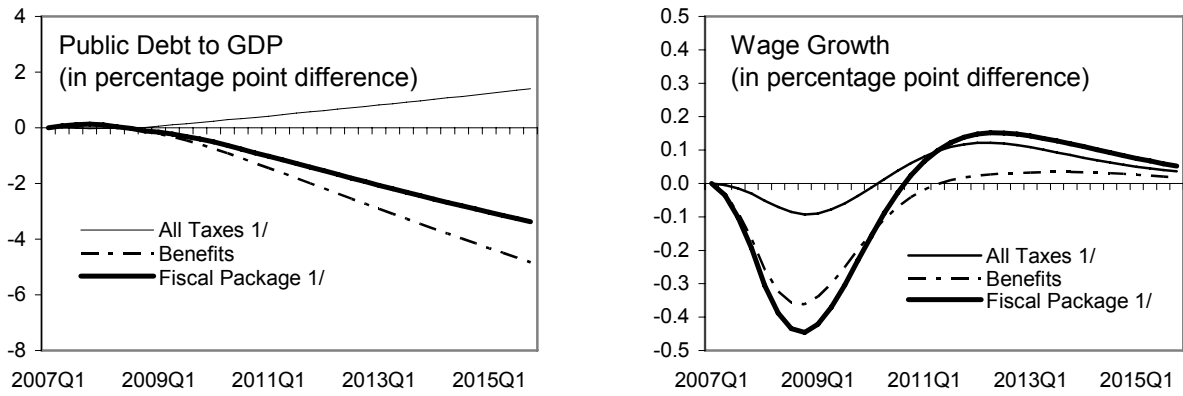


Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.



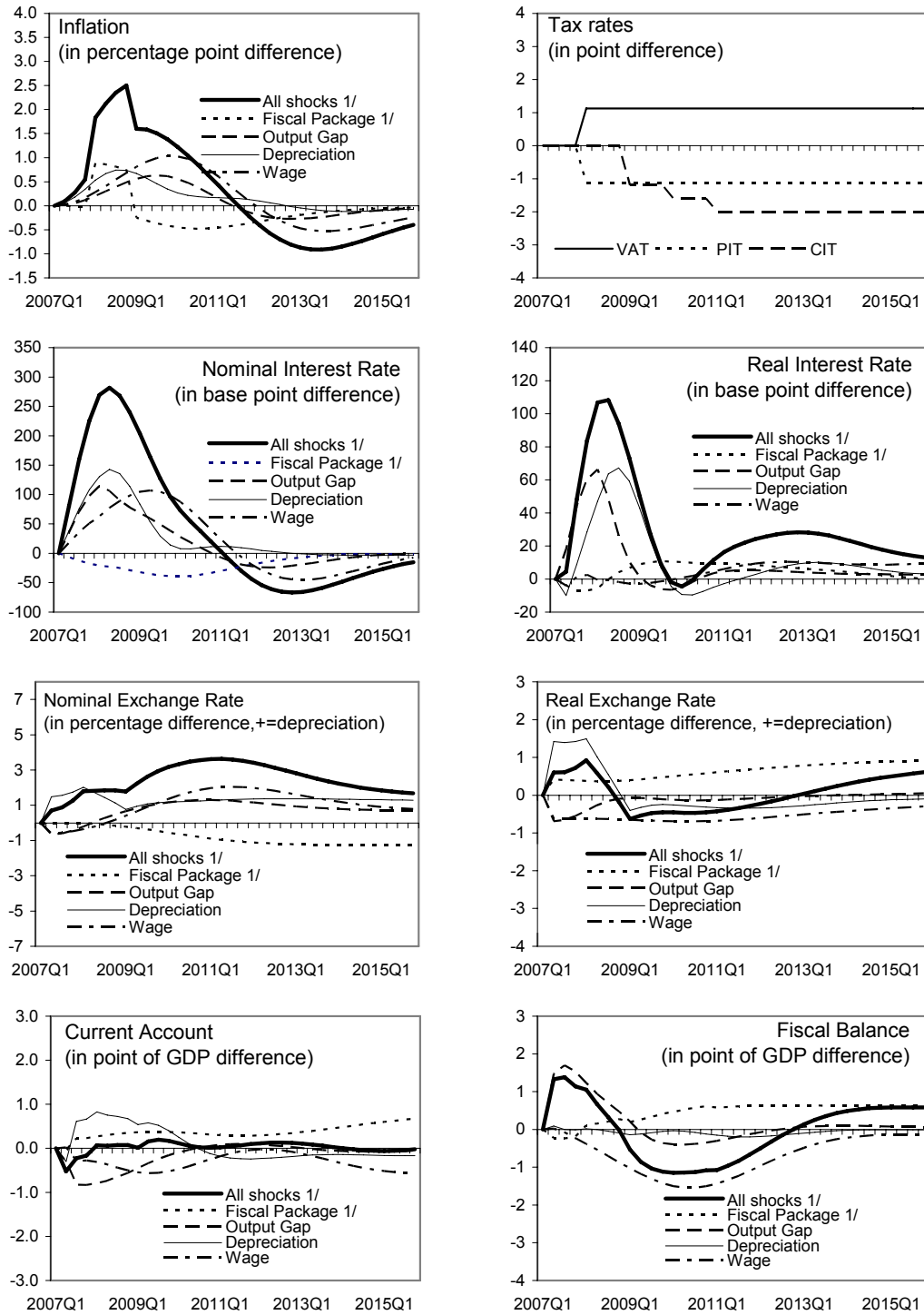
Appendix Figure 2d . Czech Republic: Fiscal shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

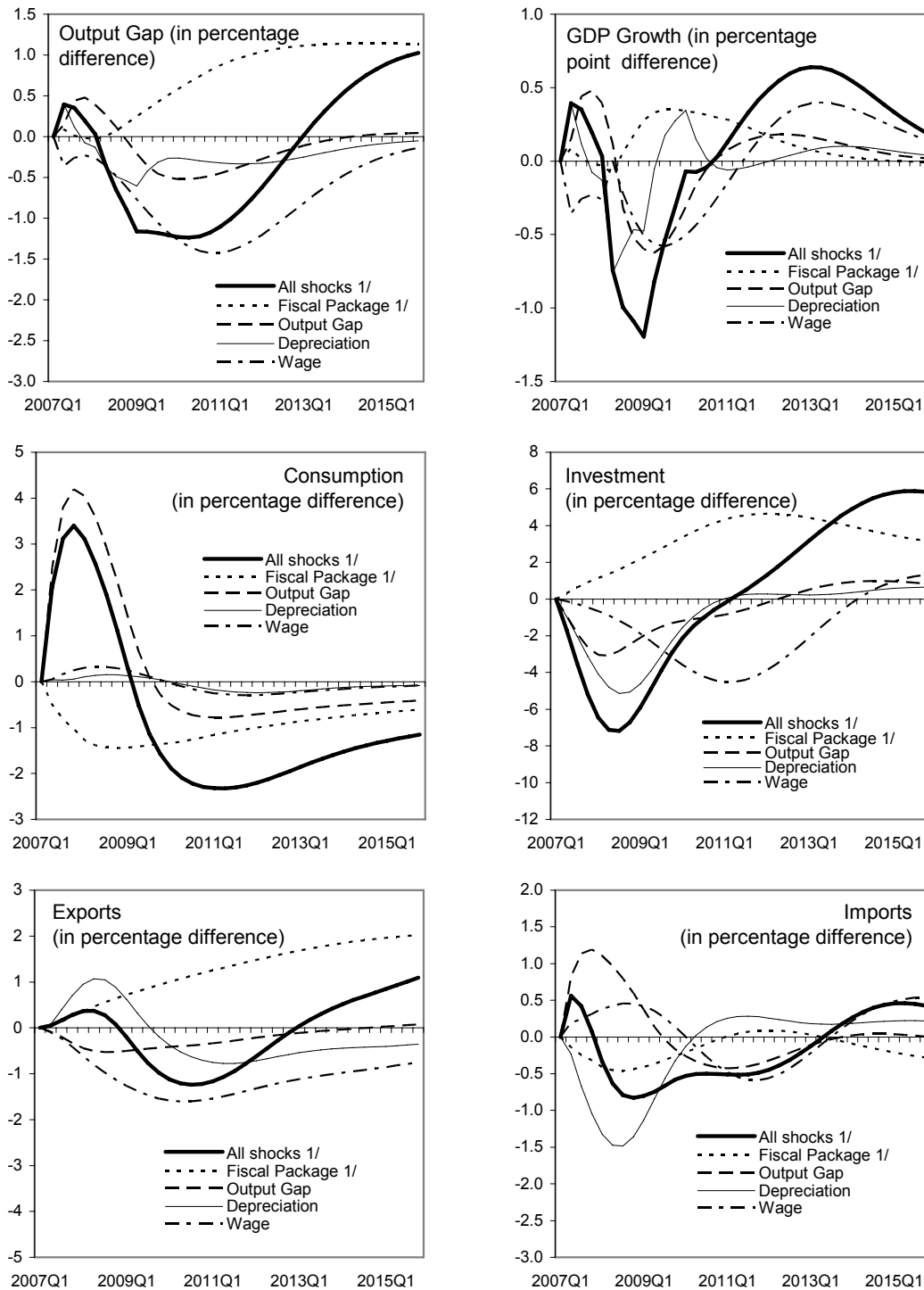
Appendix Figure 3a. Czech Republic: Fiscal, Output Gap, Wage and Depreciation shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

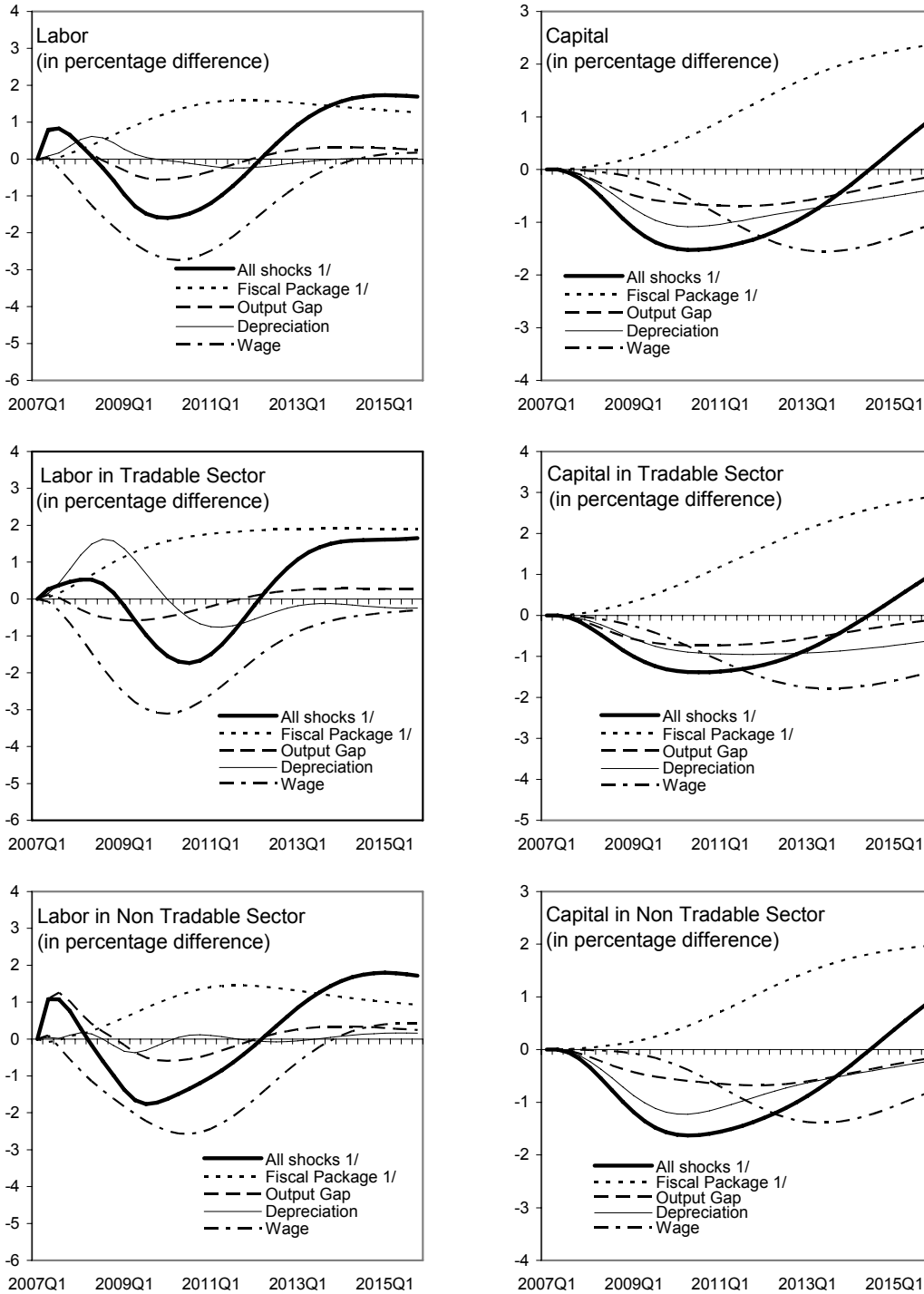
Appendix Figure 3b. Czech Republic: Fiscal, Output Gap, Wage and Depreciation shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

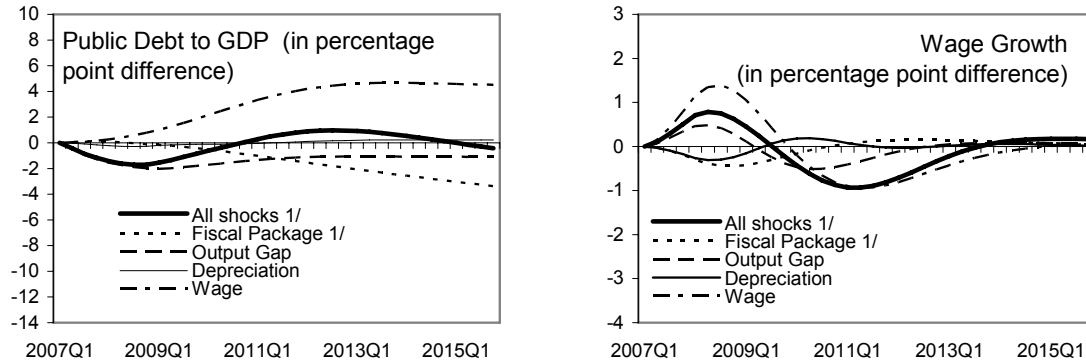
Appendix Figure 3c. Czech Republic: Fiscal, Output Gap, Wage and Depreciation shocks, 2007-15



Source: IMF staff estimates

1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

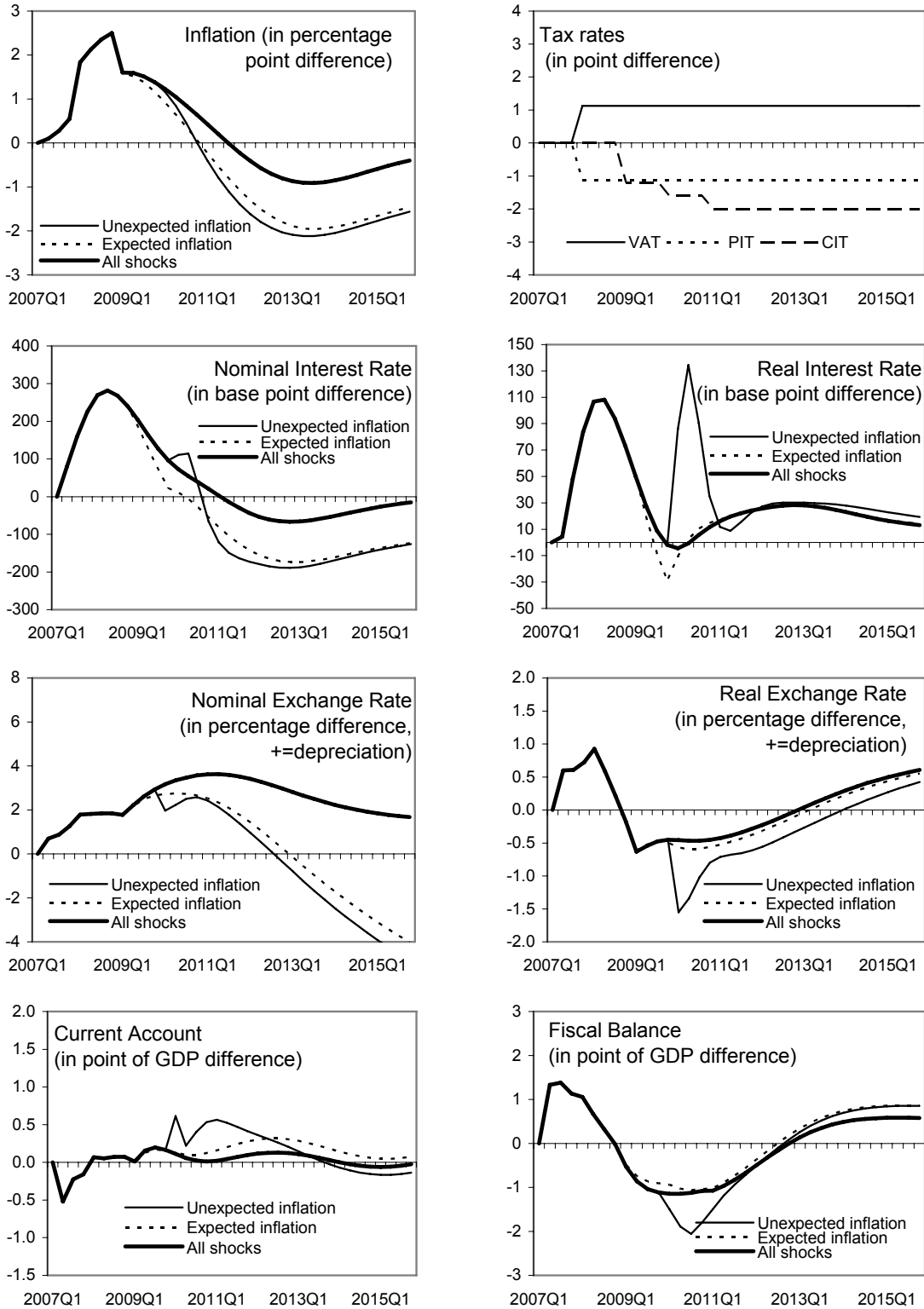
Appendix Figure 3d. Czech Republic: Fiscal, Output Gap, Wage, and Depreciation shocks, 2007-15



Source: IMF staff estimates

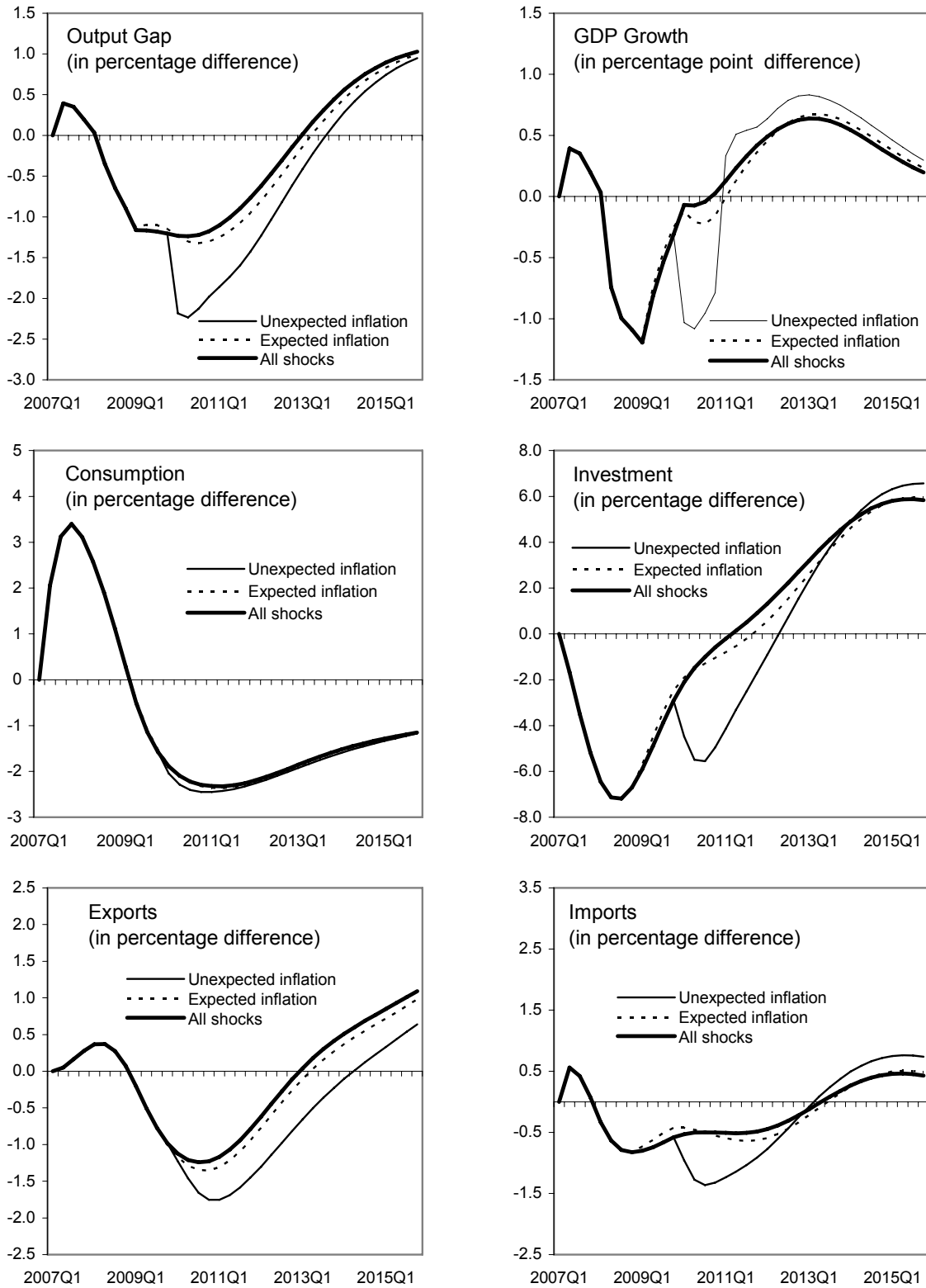
1/ First round effects are included in the headline inflation. However, they are not in the inflation indicator taken into account by monetary policy.

Appendix Figure 4a. Czech Republic: All Shocks and Reduction in Inflation Target, 2007-15



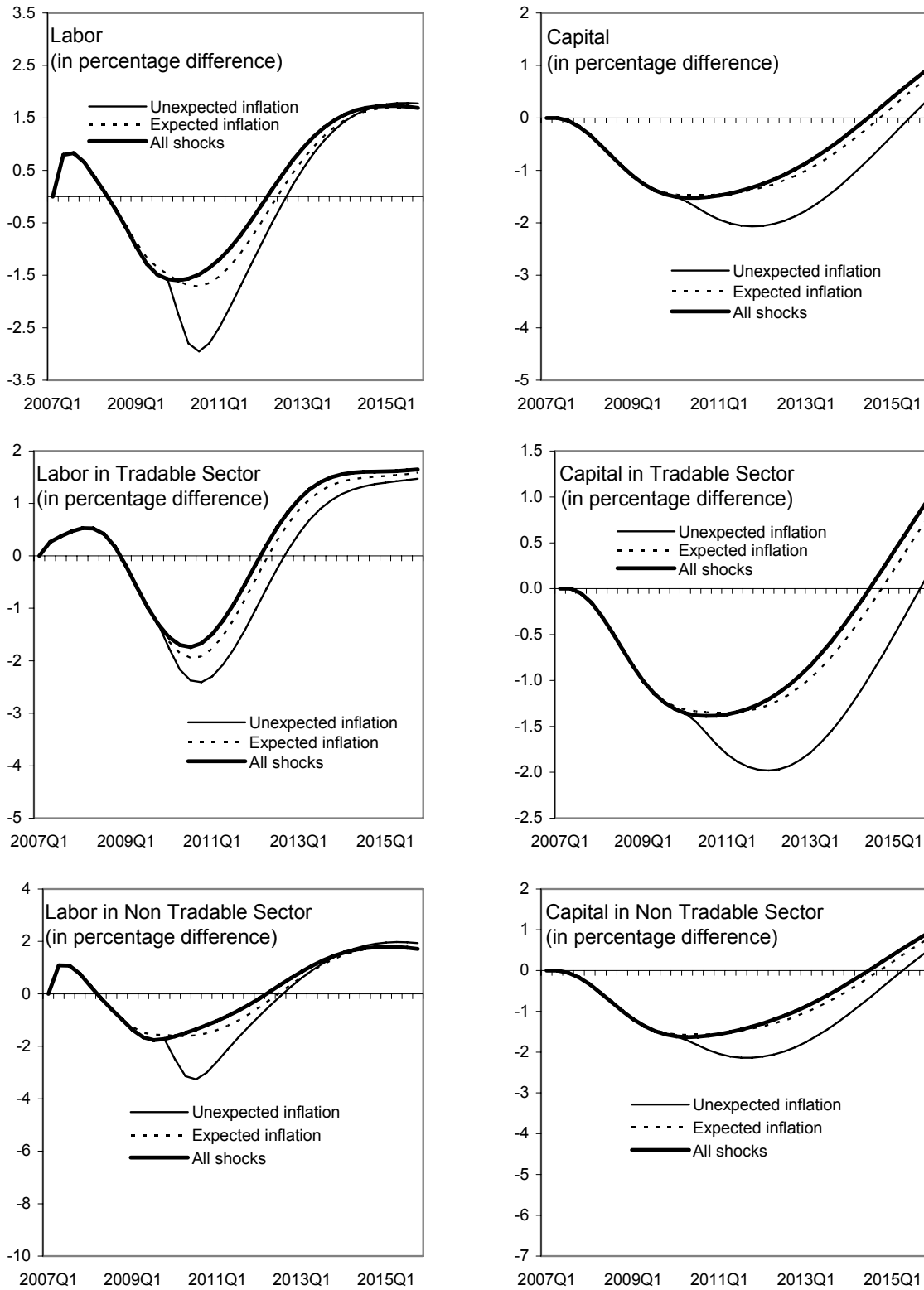
Source: IMF staff estimates.

Appendix Figure 4b . Czech Republic: All Shocks and Reduction in Inflation Target, 2007-15



Source: IMF staff estimates.

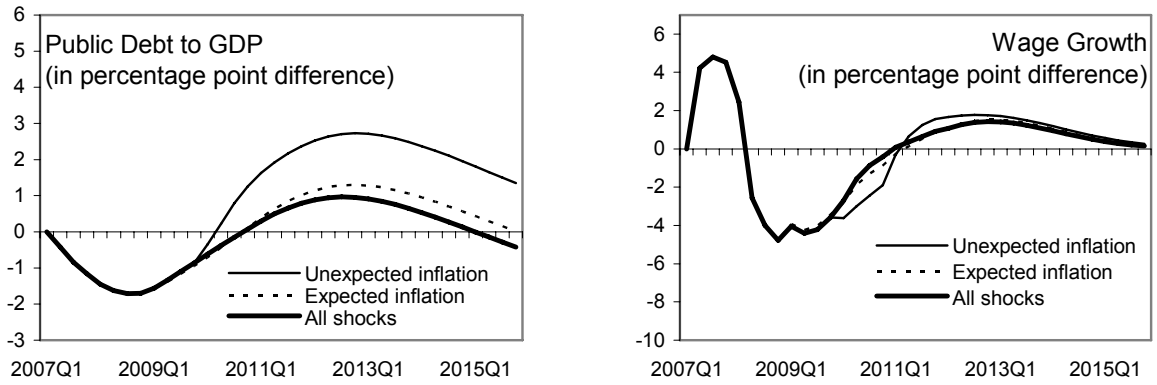
Appendix Figure 4c. Czech Republic: All Shocks and Reduction in Inflation Target, 2007-15



Source: IMF staff estimates.



Appendix Figure 4d. Czech Republic: All Shocks and Reduction in Inflation Target, 2007-15



Source: IMF staff estimates.