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## **Welfare and Efficiency Effects of Alternative Tax Reforms in Slovenia**

### **Abstract**

*This non-technical paper presents early results of our simulations of alternative tax reforms in Slovenia within a simple general equilibrium framework. We find that progressive tax regimes in general outperform flat tax alternatives in terms of welfare. In terms of efficiency, i.e. in terms of labor effort and production, however, some flat tax settings*

*represent significant improvements compared to the current tax regime, which is also true for adapted progressive regimes, and sometimes even more so. Ultimately, since the general deduction does not compensate for the increase in the marginal tax rate and the loss in the purchasing power due to a higher consumption tax in some low income segments, flat tax settings generate a potentially sizeable*

*fall in the participation rate. We also discuss the limitations in shifting the tax burden from labor towards a single rate VAT, the flat tax effects on the tax setting simplicity, on human capital accumulation, and the competitiveness of the economy. Finally, we question the rationale for the imposed constant net wage transition that is specific to the Slovenian flat tax proposal.*

### **1. Introduction**

Economic theory and practice put forward that the design of the tax setting exerts strong effects on economic activity. Marginal and average tax rates on labor income can affect individual work effort and the decision to participate in the active population, and can therefore impact the aggregate labor supply and the potential output of the economy. The effective taxation of capital is a relevant determinant of physical capital accumulation, because it decreases the net capital income at the margin and deters from investment decisions. This in turn reduces the potential output as physical capital is a crucial production factor. Furthermore, theory also suggests that taxes may affect human capital accumulation since the taxation of productive work is an incentive for economic agents to reduce their in-work and formal education. Finally, many tax settings are complicated, non-transparent and sometimes entailing sizeable costs for the economy in terms of compliance costs and the administrative burden. Acknowledging the distortive effects of taxation is often advanced - and rightly so we believe - as a motivation for implementing tax reforms with the aim of decreasing the inefficiencies that taxes impose on economic activity.

However, the optimal tax setting, at least as seen by economic theory, is the one that maximizes the welfare and not necessarily the production of the population. Welfare is typically defined as arising from the preferences of the population. In particular, in modern economic models a risk-averse population values efficiency and production that enable higher consumption, but dislikes the work effort necessary for production and the dispersion of lifetime incomes. The dispersion of lifetime incomes indeed increases the income risk in a given economy, which decreases the expected welfare of a risk-averse individual in the economy. All elements affecting the population's preferences and welfare must therefore be taken into account when comparing alternative tax settings. Comparing welfare outcomes is crucial since a tax reform may give rise to trade-offs between production or growth and welfare. In a revenue-neutral tax reform, the production incentives stemming from a decrease in the progressiveness of the personal income tax have to be traded off against a higher work effort and a larger lifetime income dispersion, as the tax system typically becomes less redistributive. In this respect, it must be welcomed that the title of the most recent reform proposals concerning the Slovenian economy set forth by the Committee for Reforms explicitly

\* The authors are from the Analysis and Research Dept. of the Bank of Slovenia. This paper is related to a presentation given at the International Academic Forum on Flat Tax Rate, Bled, February 2006. The expressed views do not necessarily correspond to those of the BoS board.

expresses the need to increase welfare, which also motivates this research.<sup>1</sup>

This paper in form of a non-technical discussion aims to provide intuition on the transmission mechanisms of different candidate tax reforms in Slovenia, attempts to quantify their effects on welfare and efficiency, and relates them to the theoretical and empirical literature.<sup>2</sup> It applies a simple general equilibrium model to compare alternative tax regimes in terms of efficiency (i.e. GDP, work effort, participation, etc.) as well as in terms of welfare, enabling thus to rank the tax regimes according to preferences. To identify the transmission mechanisms from taxes, the tax reforms we compare are revenue-neutral and conceptually as diverse as possible, ranging from several flat tax variants to fairly progressive tax settings. Finally, in addition to the issues related to the model experiments, the paper discusses some of the concepts that the Committee for Reforms has proposed with respect to its specific version of the flat tax reform.

The early findings from the model economy simulations can be summarized as follows. In terms of efficiency, according to our simulations, improving the current tax setting potentially raises GDP and consumption by some ten percent. The stronger effect arises from an increase in the individual labor supply, since a lower tax burden at the margin in all reforms examined boosts the work effort. Another strong effect is the transmission from capital, which depends especially on capital taxation, and which besides its direct effect on production also increases the value of labor and raises wages. As expected, flat tax regimes in general increase production with respect to the current regime, but some progressive tax regimes may raise GDP and consumption to an even higher level. Because switching to a flat tax results in a lower compensation of low-skilled labor, it usually generates a lower participation rate which limits efficiency gains. In simulations that assume an inelastic individual labor supply, production even falls due to lower labor participation in all tax reforms involving a decrease in low-skilled labor compensation and flat tax regimes therefore perform particularly badly. Finally, if the lifetime productivity risk increases, which is one of the likely consequences of globalization, progressive

tax regimes are to be favored even more compared to flat tax regimes.

In terms of welfare, however, the examined flat tax regimes appear to be inferior to progressive tax regimes. Efficiency gains leading to higher lifetime consumption do not compensate for the additional risk in the lifetime revenue and the enhanced work effort or forgone leisure the flat tax regimes generate. In comparison to the current tax system, in all but one scenario significantly less than half of the households benefit from the introduction of a flat tax regime, but a majority of the households prefers a reform that retains a progressive tax system while shifting the tax burden from labor to consumption.

This introduction is followed by two sections and a conclusion. Section 2 presents and analyzes the simulations of alternative tax reforms in Slovenia, while section 3 discusses particular issues connected to the model experiments and to the implementation of the reforms.

## 2. Efficiency and Welfare in Simulated Tax Reforms

### *The Model Economy and the Simulated Tax Regimes*

To gain intuition on the macroeconomic effects of tax reforms and attempt their quantification we have to build a simple general equilibrium model. We believe a credible candidate model for a tax reform evaluation must incorporate at least the following: explicit households' preferences and the available technology, household heterogeneity for a meaningful welfare analysis, elastic individual labor supply and an endogenous participation decision, the international free flow constraint on the domestic capital stock, overlapping generations since tax reforms may differently affect workers and pensioners and, finally, an explicit and complete tax and social security system. A non-technical description of the model mechanisms is presented in box 1. The simulation experiments are performed in form of a comparative static analysis of the model equilibrium outcomes in different tax settings.

<sup>1</sup> The newest version of the reform proposals published by the Government of Slovenia is entitled "Framework of the economic and social reforms for increasing welfare in Slovenia" as opposed to an earlier version prepared by the Committee for Reforms entitled "Proposal of the concepts of economic and social reforms to increase the competitiveness of the Slovenian economy" (authors' translation).

<sup>2</sup> The formal outline of the model, the detailed presentation of the simulations and the due robustness analysis are forthcoming soon.

**Table 1: Model economy in different tax settings**

Scenarios	baseline	flat tax 20%	flat tax 20% low k	flat tax same T ratio	flat tax only on L	flat tax on L and C	"Kranjec"	Alterna- tive 1	Alterna- tive 2
		1	2	3	4	5	6	7	8
<b>VAT</b>	0.1485	0.2	0.2	endog.	0.1485	endog.	endog.	0.2	0.2
<b>other cons.</b>	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
<b>capital</b>	0.15	0.2	0.15	endog.	0.15	0.15	0.15	0.15	0.1
	brackets						brackets	endog. $\lambda$	endog. $\lambda$
	up to 0.4						up to 0.6	up to 0.4	up to 0.4
	0.16						0.17	$\lambda \times 0.16$	$\lambda \times 0.16$
	0.4 to 0.75						0.6 to 1.7	0.4 to 0.75	0.4 to 0.75
<b>labor /</b>	0.33						0.28	$\lambda \times 0.33$	$\lambda \times 0.33$
<b>personal income</b>	0.75 to 1	0.2	0.2	endog. flat	endog. flat	endog. flat	above 1.7	0.75 to 1	0.75 to 1
	0.37						0.42	$\lambda \times 0.37$	$\lambda \times 0.37$
	1 to 1.5							1 to 1.5	1 to 1.5
	0.41							$\lambda \times 0.41$	$\lambda \times 0.41$
	above 1.5							above 1.5	above 1.5
	0.5							$\lambda \times 0.5$	$\lambda \times 0.5$

Notes:

1 Endogenous taxes are computed so that the tax ratio remains unchanged.

2 Brackets boundaries are set in proportion to the (endogenous) average gross wage.

3 "Baseline", "Kranjec", "Alternative 1" and "Alternative 2" are completed with the current system of a general allowance, an additional 2% deduction and the deductions for dependents.

4 Flat PI taxes are specified in correspondence to the "Reforms Programme": general allowance of 0.2 of the average gross wage and a deduction per dependent worth the equivalent of an allowance of 0.15 of the average wage (respectively roughly 110% and 80% of the minimum income)

Scenarios	baseline	flat tax 20%	flat tax 20% low k	flat tax same T ratio	flat tax only on L	flat tax on L and C	"Kranjec"	Alterna- tive 1	Alterna- tive 2
		1	2	3	4	5	6	7	8
<b>Endogenous tax</b> (in %)	None	None	None	All 18.45	Labor 35.18	Labor, VAT 19.51	VAT 16.93	Labor $\lambda$ 50.31	Labor $\lambda$ 69.84
<b>GDP</b> (baseline = 1)	1.00	1.06	1.11	1.10	1.03	1.12	1.07	1.12	1.11
<b>Capital/GDP</b>	2.32	2.18	2.32	2.22	2.32	2.32	2.32	2.32	2.45
<b>Effective labor</b>	0.70	0.76	0.77	0.78	0.72	0.78	0.75	0.78	0.76
<b>Participation</b> (in %)	70.37	68.68	70.00	70.60	66.98	70.47	69.60	71.79	71.28
<b>Individual labor</b> [1;2]	1.26	1.35	1.36	1.37	1.30	1.36	1.34	1.37	1.33
<b>Consumption</b>	0.56	0.58	0.61	0.62	0.57	0.62	0.60	0.63	0.61
<b>Avg. net wage</b>	1.00	1.17	1.20	1.19	1.08	1.20	1.12	1.20	1.16
<b>HS</b>	0.21	0.22	0.21	0.21	0.22	0.21	0.21	0.21	0.21
<b>Capital taxes/GDP</b>	4.50	6.00	4.50	5.54	4.50	4.50	4.50	4.50	3.00
<b>Cons. taxes/GDP</b>	12.08	16.42	16.50	15.41	12.08	16.17	13.85	16.63	16.30
<b>Labor taxes/GDP</b>	9.25	5.22	5.27	4.88	9.25	5.16	7.47	4.70	6.53
<b>Total taxes/GDP</b>	25.82	27.64	26.27	25.82	25.83	25.83	25.83	25.83	25.83
<b>Welfare rank</b>	7	9	8	6	5	4	3	2	1
<b>% of households better off</b>		22.52	38.31	40.32	61.83	47.18	64.44	56.29	72.72

**Box 1: A non-technical summary of the model economy setting**

Risk-averse households of two members maximize their lifetime utility given their endowment in merchant productivity, home sector productivity and their share of the aggregate capital stock. The households' lifetime utility is a concave function of lifetime consumption, reduced by the disutility of the work effort (or forgone leisure). A composite consumption good can be exchanged for the net wage, the net capital income, or arise from home production. Households live through two distinct periods. The first period is the earning period, in which they may engage in the merchant sector, called GDP, or the home sector, called non participation. In the merchant sector they earn a wage corresponding to their productivity and effort, while in the home sector they contribute a home product to the household's consumption. The second period is a period of retirement where all individuals benefit from their home production and from a pay-as-you-go pension depending on their participation in GDP during the earning period. Individuals maximize the household utility by choosing to engage either in GDP or in the home sector and, in GDP, by selecting an optimal level of effort, potentially generating an individual labor supply anywhere up to a double of the minimal one. We constrain all households to have at least one participant during the earning period, i.e. at least one member engaged in GDP. Finally, a constant portion of each type of households is replaced by a newborn household, thus ensuring the stationarity of the population in equilibrium.

The GDP technology is a Cobb-Douglas production function, involving constant returns to scale in capital and labor. The capital stock is determined by the net return on capital, which, assuming a small open economy and free capital flows, must correspond to the international net return on capital in the long run. The net return on capital is the return after both taxes and depreciation. The home sector technology is linear in labor supplied to that sector.

The model is parameterized so that it resembles the Slovenian economy in dimensions that are relevant for the conducted tax experiments. In particular, the underlying productivity distribution is such that the model-generated gross wage distribution closely corresponds to the actual one in Slovenia and the home sector productivity distribution such that the participation rate equals the current one. The

earning period and the retirement period reflect average years of employment and pensions. Eventually, the structure of the model economy enables to examine various and detailed tax settings, encompassing consumption, labor revenue and capital revenue taxes. As is standard, the welfare criterion used is the expected lifetime utility of a household in the model economy.

The current tax regime, "baseline", is compared to five regimes featuring a flat tax at least on labor income, the "Kranjec" proposal, and two alternatives. All tax settings are represented in the upper part of table 1. Regime (1) is a flat tax of 20% on labor income, capital income and consumption, while in regime (2) a flat tax of 20% on labor income and consumption is accompanied by the effective capital tax remaining at 15%. In regimes (3), (4) and (5) a flat tax is endogenized so that the tax-to-GDP ratio equals the one in "baseline", which is a more accurate way to compare tax settings. Regime (3) is a flat tax on labor, capital and consumption, (4) a flat tax on labor income only and (5) a flat tax on labor and consumption, with the effective capital tax rate remaining at 15%. The "Kranjec" proposal (6) involves three brackets instead of the five in the current regime and lower, albeit still progressive, marginal rates on labor income, with an endogenous adjustment in the consumption tax to keep the tax-to-GDP ratio unchanged. Regimes (7) and (8) are two alternatives that also decrease the taxation on labor income by shifting the tax burden on consumption and keeping the tax-to-GDP ratio unchanged, but they do so by decreasing by the same proportion the marginal tax in all brackets. Regime (8), "Alternative 2", in addition decreases the effective tax on capital to 10%, but at the expense of a lower tax relief on labor than in regime (7).

The tax regime specifications above are completed by a corresponding system of exemptions, deductions and social security contributions. "Baseline", "Kranjec", "Alternative 1" and "Alternative 2" embody the current system of the general allowance from the tax base, the additional 2% deduction and the deductions for dependents. Flat tax regimes are specified in correspondence to the proposal of the Committee for Reforms, imposing a general allowance of 20% of the average gross wage and an additional deduction per dependent person worth the equivalent of an allowance of 15% of the average gross wage. Finally, the social security system is the same in all regimes, with the pay-as-you-go pension contributions such that they finance net pensions at 70% of the net wage earned.

## Effects on GDP

Looking at GDP we see that all alternative tax regimes perform better than the baseline, with an increase of sometimes up to around ten percent, which is significant. Notice that changes represent changes in the *level* of the potential GDP and not its growth rate. The growth rate only increases on the transitory path between the baseline and new equilibrium so that its cumulative amount equals the increase in the potential GDP. So why does GDP increase in all the scenarios?

The most important factor behind the increase in GDP is the increase in the average work effort, i.e. individual hours worked. In particular, because in all regimes marginal labor income tax rates for the most productive workers decrease, these agents prefer to work more when earning higher incomes at the margin. The productive value of the supplementary hours provided by the most productive workers outweighs the output loss due to less hours worked and a decreased participation rate of the less productive workers who face higher marginal taxes after the reform. This is consistent with the literature on flat tax rates where lowering the marginal tax rate on labor increases the supply of labor.<sup>3</sup>

However, besides the work effort, tax regimes also affect the participation rate, since they affect the relative incomes in GDP and the home sector. The “alternative 1” raises GDP even more than flat taxes do, and so does (but for one exception) “alternative 2”. This is because alternatives 1 and 2 in fact decrease the marginal tax rates for *all* workers. Flat taxes typically increase marginal tax rates for some segment of the less productive workers, which explains why the participation rate in three of the five scenarios falls. Some of the less productive workers do not find it worthwhile anymore to work in the merchant sector and engage in home production where they pay no taxes. In

accordance with the literature it is therefore the less skilled agents who are much more prone to quit the merchant sector than the more productive ones.<sup>4</sup> We can also deduce that GDP increases the least in regime (4) because it increases the marginal tax for the less productive workers so much that participation declines significantly.

Apart from labor supply, the other major transmission channel here is physical capital accumulation. Taxing capital in general harms output in two ways.<sup>5</sup> First, taxes on capital decrease the net capital income, discourage investment and therefore reduce the capital stock and production. Second, the diminished domestic capital reduces the marginal productivity of labor and therefore generates a fall in wages, because wages for all levels of skill depend positively on the capital to work with. We observe that GDP increases by the second-smallest amount in scenario (1) – the flat tax of 20% on everything – in particular because in this setting the effective capital tax rate shoots up from 15 to 20%. While a number of papers show that the flat tax can directly have a positive effect on capital accumulation, it must be emphasized that in Slovenia a pure flat tax of 20% would *raise* the effective capital tax rate. Now it also becomes clear why “alternative 2” performs so well in terms of GDP, as its lower effective capital tax makes investing in this economy more attractive. This is also very much consistent with the literature.<sup>6</sup>

## Effects on Welfare

But there is more to life than GDP. In economics, the most important variable to look at is overall welfare, and in this respect most of the flat tax regimes that we evaluate make the society *worse off*. Measuring welfare is essential since it enables to assess the interactions, or potential trade-offs, between economic efficiency and equity.<sup>7</sup> In our simulation agents dislike inequality because they

<sup>3</sup> This is a characteristic feature in the literature trying out flat taxes on models with heterogeneous agents. See for instance Altig et al. (1997) where the flat tax raises output by about 6%, mainly due to more labor supply. For the same reason, and also calibrated on the US, in Conesa and Krueger (2005) the flat tax increases aggregate output by less than 1%.

<sup>4</sup> This is a typical conclusion that one can find, among other, in Davis and Henrekson (2004). Note that an alternative to the home sector as a means to avoid the increased tax burden could be the underground economy.

<sup>5</sup> On the negative role of capital taxes in optimal taxation models see the seminal papers Judd (1985) and Chamley (1986).

<sup>6</sup> This mechanism is at work in the flat tax simulation found in Ventura (1999). González and Pijoan-Mas (2005) provide a simulation for Spain where the flat tax raises overall saving significantly. A substantial part of this extra saving, however, is precautionary, which is not welfare-enhancing. In these models the saving channel is somewhat stronger, since the increased stock of saving decreases the domestic long-term real interest rate and further boosts the domestic capital stock. In our model, the net real domestic interest rate is determined by international financial conditions, as we assume a small open economy and free international capital flows, at least in the long run. Since the net real interest rate remains unchanged after an increase (fall) in the effective tax on capital, the gross marginal capital revenue must increase (fall), which causes the domestic capital stock to fall (increase).

<sup>7</sup> In the literature virtually all papers stress this trade-off as regards flat taxes – see for instance Ventura (1999) for after-tax earnings inequality or Castañeda, Díaz-Giménez and Rios-Rull (1999) for wealth inequality.

*ex-ante* do not know their own type and, being risk-averse, therefore prefer a more compact after-tax income distribution. From this perspective we see clearly that alternatives 1 and 2 as well as “Kranjec” perform the best because they essentially retain a sizeable amount of redistribution via progressive taxation *and* increase GDP. As to the flat tax regimes, it appears that the pure flat tax (1) and the proposal of the Committee for Reforms (2) perform the worst and in fact even worse than the baseline scenario, the current tax regime. The increase in GDP cannot compensate for the rising inequality and the additional work effort required in production. Notice that there are other flat tax reforms, though, which do perform better in terms of welfare than the baseline scenario. This is so because compared to regimes (1) and (2) labor income taxation is lower in (3) and (5), and consumption taxes are lower in regime (4).

An alternative option is to look at the percentage of households that are better off, in terms of their own welfare, than in the baseline scenario.<sup>8</sup> Again alternatives 1 and 2 appear attractive, with respectively 56% and 73% households better off. The reason why alternative 2 in particular performs so well is because the lowering of the capital tax increases capital, and therefore boosts wages for the same amount of work. It is worth noting that when a household's increase in consumption is due to longer work hours, then their increase in utility, *ceteris paribus*, is only the difference between the benefits of extra consumption and the disutility of more work, while with a rise in capital one could consume more without working more. Interestingly, of all the flat tax rates only option (4) with a very high labor income tax of 35% leaves more households better off compared to the baseline. The reason for a relatively high preference for this regime is threefold. First, the consumption tax does not change, improving the situation of the non-employed part of the population (pensioners). In addition, very highly productive workers pay lower taxes since their marginal tax rate becomes lower. Finally, low productive workers benefit from the higher general allowance and gain more from the tax deduction, given that it is proportional to the (higher) marginal tax rate in this model. The losers here are the middle class households, many of whom decide to retire into the home sector. Remember that, since the marginal

tax rate increases for a great proportion of the active population, the efficiency gains are low.

### ***Inelastic Labor Supply and Higher Individual Productivity Risk***

We shortly discuss two additional sets of simulations that may help to understand some of the mechanisms underlying the tax effects in the model economy. One is the trivial case where the amount of hours worked remains fixed, no matter what the fiscal regime is, making the individual labor supply inelastic. This is admittedly quite unrealistic in the long run context when work practices can adjust. After all we can observe different work effort levels everywhere around. Nevertheless, a fixed individual labor supply may still be true in a number of jobs, and some authors find that men in particular tend to supply labor quite inelastically.<sup>9</sup> Under such assumptions all flat tax regimes perform worse because they increase inequality and at the same time lower potential GDP. The fall in GDP is again due to the many workers who decide to quit the merchant sector as a reaction to the rise of their effective marginal tax rate, while the individual labor supply of those at work does not change. Trivially, if taxes impose no inefficiency on individual effort, the optimal tax system must be designed so as to (completely) alleviate the lifetime risk, which requires redistribution and therefore potentially progressiveness.

A second simulation consists of increasing the variance of the individual productivity in the economy so that the gap between more and less productive workers widens, but the average remains the same. In this model this is equivalent to saying that pre-tax inequality increases. It is then not surprising that flat tax regimes again perform particularly badly in such a setting given that households are risk-averse. There are a number of different reasons for why the difference in productivity between agents might increase in the future. The process of globalization is perhaps the most blatant, because it entails that high-productive workers can sell their services at ever higher prices and that less productive workers are increasingly in competition with similarly-skilled workers from low-wage countries.<sup>10</sup> In the context of the model examined here, globalization should lead to *more* progressive income taxation, not less.

<sup>8</sup> This argument concerns in fact more the (political) feasibility of any reform. It is not strictly an economic argument such as overall welfare, which is independent of the individual agents' position in the current regime and therefore does not discriminate between them.

<sup>9</sup> See Disney (2000) for a thorough discussion of the literature on labor supply elasticity and the link between tax systems and labor supply.

<sup>10</sup> See Piketty and Saez (2006) for an instructive analysis of inequality developments, and in particular the growing inequality between high and low-productive workers.

### 3. Discussion

The early results of the model economy provide, we believe, rich results in terms of intuition and quantification of the economic mechanisms relevant in the tax reform design. However, all model economies are only a simplified representation of reality. In this section we succinctly discuss some issues that complete the above analysis based on the model economy and that might contribute to the tax reform debate. Of course, all of the issues discussed would require research on their own.

#### ***The Role of the Human Capital Accumulation***

Decreasing the tax rates could be beneficial for productive work, since it provides an incentive for economic agents to increase their in-work and formal education, thus boosting human capital and output. This could provide arguments for even stronger tax effects than the ones presented here, and surely constitutes some guidance for our future research. Yet one difficulty with this logic is that the direct costs of human capital investment are usually much smaller than the indirect costs of foregone earnings, which are implicitly tax-exempt anyway (if taxes are cut then your opportunity cost of not working while you are in school *increases*).<sup>11</sup> A more plausible possibility for the human capital effects is “learning by doing” where labor productivity increases with time spent at work. Can this argument provide additional motivation for a flat tax setting on efficiency grounds? Probably not. Flat taxes may generate higher effective labor, as in our simulations, but this is even more true for some of the alternative reforms. In addition, it is not far-fetched to argue that “learning by doing” depends more heavily on the participation rate than on the individual labor supply. If a flat tax boosts effort at the expense of a lower participation rate, this does not necessarily translate into optimal or even positive “learning by doing” effects.

Based on theoretical models with human capital accumulation, supporters of the flat tax sometimes argue that it has the potential to raise growth by several percentage points, and this indefinitely. This

is in contrast with our model and most of the tax literature in that it concentrates on the *GDP level* effect, where the growth effect are temporary and intervene between two long-term equilibria. Growth effects are difficult to reconcile with the theoretical and even more with the empirical literature. More labor input in classical growth models simply means a higher level of potential GDP, not higher growth. It is only in parts of the endogenous growth theory that higher growth rates can be generated due to faster technological progress stemming either from debatable assumptions about the labor supply elasticity or more generally because they introduce a strong link between personal income taxation and human capital accumulation.<sup>12</sup> Increasing long-term growth in fact must be linked to human capital accumulation, which is solely capable of explaining the conception and adoption of new technologies.<sup>13</sup>

In general the problem with models incorporating human capital is that they build on the assumption that agents have very long time-horizons and the capacity of the human capital accumulation is assumed to be infinite. Also, the decision to acquire education might have more to do with social status-seeking than directly with expected future wages. Moreover, a progressive tax system also helps to ease the financial situation of the less well-off, who have liquidity constraints that hinder optimal human capital investment. Progressive taxation thus serves as a partial substitute for missing credit and insurance markets.<sup>14</sup> Since we do not as yet have any decisive presumption on whether taxes in general rather boost or hinder human capital accumulation, we have not included this feature in the current version of the model.

#### ***How Much Room is There for Shifting the Tax Burden from Labor Towards Consumption?***

All tax simulations in section 2 (but scenario 4) involve shifting the tax burden from labor to consumption, in accordance with the principle to tax what you take out the economy and not what you put into it. This partly alleviates the distortive effect of taxes on work effort and enables for the

<sup>11</sup> Heckman, Lochner and Taber (1998), on the other hand, emphasize that progressive taxation discourages education as the tax saved while in school is smaller than future taxes due to increased education-related earnings.

<sup>12</sup> One such recent model is Caucutt, Ýmrohordlu and Kumar (2003). See also Cassou and Lansing (2002) where the flat tax increases GDP by about the same amounts both in a classical and an endogenous growth setting.

<sup>13</sup> Jones, Manuelli and Rossi (1993) find a sizeable growth effect due to very elastic labor supply. Lucas (1990) in a similar model where long-run growth depends on human capital accumulation finds that a flat tax would have a positive but trivial growth effect, partly because he treats labor as inelastic. See Stokey and Rebelo (1995) for a discussion of these papers, and a conclusion that in most endogenous growth models with a representative agent the growth effect is almost zero.

<sup>14</sup> Bénabou (2002), for instance, calculates that these positive and negative effects of progressive income taxation on human capital investment basically cancel out each other.

efficiency gains in production. Nevertheless, increases in consumption taxes may generate unfavorable transitory effects on competitiveness and employment, and permanent ones on welfare. This depends in particular on the way this shift in taxation is operated, as well as on whether the final consumption tax rate is flat or not, i.e. whether two VAT rates remain in place or not.

Contrary to what might be a common perception, effective taxes on consumption in Slovenia are already rather high, while the effective labor income taxation does not stand out. Following Eurostat (2005) computations, only five EU25 countries tax consumption more heavily than Slovenia. On the side of labor taxes, the Slovenian labor income taxation appears to be largely comparable with that of other EU countries according to numerous sources. As reported by Eurostat (2005), World Bank (2005), and Capirolò (2006) the overall tax wedge in Slovenia is somewhere around the EU average, and its progressivity actually does not stand out at all.<sup>15</sup> Dolenc and Vodopivec (2005) arrive at somewhat different conclusions by showing that the Slovenian tax wedge is currently the third highest in the EU.<sup>16</sup> Yet even according to their numbers, the Slovenian average and marginal tax rates on labor income will decrease substantially compared to the rest of the EU owing to the already-decided gradual elimination of the payroll tax. Only Damijan and Polanec (2005) contrasts with these findings by reporting by far the highest tax wedges for Slovenia, and claim that the labor income taxation in Slovenia is higher than in all OECD countries. It is, however, to be feared that this result is due to an unfortunate computational error, which is rather awkward, given that these authors base their reform proposals on the presumption of extreme labor taxation in Slovenia.<sup>17</sup> Anyhow, wherever the tax burden on labor currently stands, we believe that high (marginal) tax rates do matter for economic activity (i.e. permanent potential output and thus transitory growth increase), which is why they play a prominent role in the model of section 2.<sup>18</sup>

Following Damijan and Polanec (2005), by introducing a flat value-added tax (VAT) at 20% Slovenia would become the country most heavily taxing consumption in the EU-25, almost twice as heavily as in neighboring Italy. This is arguably a lot, but all simulations in section 2 are based on comparable increases of the VAT. Yet, the Committee also envisages a *single-rate* VAT system. It is worth noting that in practice VAT systems are characterized by different tax rates. In the EU, all countries but Slovakia and Denmark currently apply a reduced VAT rate for some products.<sup>19</sup> Moreover, some types of products are frequently exempt from VAT systems, such as transport services in Denmark, to mention but one example.

In the context of implementing a single VAT rate, shifting the tax burden from labor to consumption may be subject to limitations. First, if the tax burden shift is not neutral at the individual firm or industry level, it may at least transitorily affect competitiveness. This holds in particular for sectors with a relatively low labor share and/or subject to foreign competition (such as food, tourism, retail, and so on) even when a tax reform is revenue-neutral from the aggregate economy point of view. An increase in VAT rates, especially a large increase in the reduced VAT rate could have, *ceteris paribus*, a substantial effect on prices of some Slovenian goods and services and could therefore negatively affect the net purchases of non-resident households on the Slovenian market, which may not be negligible also in terms of VAT revenues. A VAT increase with differentiated rates may alleviate these harmful effects on the economy.

The second argument for a VAT rate differentiation stems from its permanent impact on equity and welfare. Using a computable general equilibrium model, Løvitsland and Aasness (2004), among others, show that the Norwegian VAT reform of 2001 that introduced a reduced VAT rate on food and non-alcoholic beverages undoubtedly increased equality. This result is quite intuitive, for even though the rich spend a larger *absolute* amount on

<sup>15</sup> For example, Eurostat (2005) calculations show that the implicit tax rate on labor in Slovenia was the eleventh lowest in the EU in 2003, while World Bank (2005) reveals that the tax wedge for APW (average production wage in manufacturing) earners in Slovenia was almost two percentage points below the EU-15 average.

<sup>16</sup> The authors point out that their calculations only take into account single individuals without children.

<sup>17</sup> They calculate the tax wedge by adding all labor income taxes and contributions, including the shares paid out by employers, and divide this sum by gross wages instead of the sum of total labor cost! The correct computation gives results in line with the rest of the literature.

<sup>18</sup> This is not to say that the empirical literature wholly supports this view. In fact one of the rare articles that does find a negative correlation between effective marginal income tax rates and economic growth is Padovano and Galli (2001), who themselves admit that their findings are "opposite to those of most empirical literature". A recent paper by Lee and Gordon (2005), based on a cross-section data set of 70 countries over 1970-1997, shows that neither the average tax rate on labor income nor effective overall marginal tax rates are significantly associated with economic growth rates, while the corporate tax rate is significantly negatively correlated with economic growth.

<sup>19</sup> European Commission (2005): VAT Rates Applied in the Member States of the European Community.



products like food, it is the *proportion* of income spent on low-taxed products that matters for the equity analysis. As the poor spend a larger proportion of their income on typically low-taxed products like food, they obviously benefit from a VAT system with such a differentiation in tax rates.<sup>20</sup> Additionally, because the share of income consumed tends to decline with increases in income, the VAT *per se* is generally considered to be a regressive tax. Thus, it makes sense to introduce elements in the VAT system to mitigate its intrinsic regressivity. Finally, shifting the tax burden from income towards consumption also clearly leaves worse-off those population groups that do not participate in the labor market (e.g. pensioners), which is a fact that should not be neglected, especially as regards the political feasibility of tax reforms.

### **“Constant Net Wages” Proposal à la Slovenian Committee for Reforms**

The Slovenian flat tax proposal includes a novelty, both in theory and practice, by planning to leave net wages constant during the transition to the new regime. The proclaimed objective of this heroic enterprise is to unburden Slovenian firms from labor costs that the Committee for Reforms judges excessive. The underlying arguments for such considerations have already been discussed above, but even if they were correct, it is up to labor market policies and not to a tax reform to address price-wage disequilibria on the labor market.

Moreover, the administrative constraint on net wages may present other conceptual problems than its objective itself, on which additional clarification from the reform proponents seems necessary. First, leaving net wages constant would require an agreement of all economic agents in the Slovenian labor market to adapt their contracts. Even if this was feasible, which remains to be demonstrated, this might end up incurring a huge administrative burden on the economy and rendering the system more complicated and opaque instead of simpler and more transparent. Second, in a market economy wages should be left to be determined by labor market forces. Whatever the tax system, in equilibrium labor costs should reflect the marginal productivity of workers and their bargaining power. More specifically, demand for labor is a function of labor costs, while the supply of labor depends on

wages net of taxes, as in the model in section 2. If labor taxes decrease, the adjustment in net wages is highly likely to be fast and it should be so. Imposing a “constant net wages” restriction under tight labor market conditions would result in a severe labor market disequilibrium, entailing substantial distortions and an administrative transfer of the labor income to firms. It is difficult to understand why such a disequilibrium, where labor costs do not reflect the productivity of workers, is to be imposed on the economy, even temporarily. Economists in general believe that tax reforms, as any institutional reforms, bear a long-lasting character and can thus only be motivated within equilibrium reasoning.

### **Does the Flat Tax Really Equal Simplicity and Transparency?**

There is little disagreement among tax system experts that the complexity of a tax system generally stems from deductions, exemptions, and special treatments, while the number of tax bracket is largely irrelevant. As Slemrod (1985) in his analysis of the tax simplification effects on compliance costs convincingly concludes, “significant resource savings can be expected from eliminating the system of itemized deductions, although no saving from changing to a single-rate tax structure can be confidently predicted”.

A flat tax system is therefore by no means the only way to achieve simplicity and transparency. In fact, some real world flat tax systems retain a plethora of deductions and exceptions, making them neither simpler nor more transparent than progressive tax system alternatives.<sup>21</sup> If the aim of a tax reform is to simplify the system, this should be done through proposals for a clearer and common definition of taxable income, which should minimize the number of exemptions and exceptions. Similarly, removing the number of allowances from the tax code would make corporate taxation more transparent and simplifying the tax procedure would lead to lower tax administration costs.

As for tax evasion and undeclared work, no clear conclusions can be drawn from either the theoretical or the empirical literature on the link between tax compliance and tax reductions. Theoretical approaches modeling tax evasion as a gamble show that a tax rate cut can actually lead to an increase in the extent of evasion.<sup>22</sup> All we

<sup>20</sup> Another option to achieve distributional goals is to implement a single-rate VAT system, but then redistribute through direct (lump-sum) payments. But the reader will understand that it is difficult (impossible) to efficiently target the redistributive needs of the population by lump-sum transfers, i.e. transfers identical for the whole population, regardless of the individual or wealth status.

<sup>21</sup> For example, see Ivanova, Keen and Klemm (2005) for the case of the Russian “flat tax”.

<sup>22</sup> See for instance Ivanova, Keen and Klemm (2005) for a discussion.

can say for sure is that econometric work so far has not provided evidence on a general relationship between tax levels and compliance.<sup>23</sup> As the Damijan and Polanec (2005) flat tax proposal would increase the tax burden for less skilled workers who are also more likely to conceal economic activity, it is quite doubtful to expect that tax compliance would increase under the flat tax.

Nonetheless, a clean flat tax on production factors and consumption is the unique tax regime with the characteristic to leave individuals and companies with no incentive to fiddle with their accounts so as to make their revenue fall under the category with the lowest tax rate. Clearly then, however, this advantage is only possible when the effective tax rates on labor and capital income are equal, which in the Slovenian case translates into a higher effective capital tax. Given the detrimental effects of capital taxation discussed above, we do not think that a higher effective capital tax rate is warranted on grounds of closing these tax loopholes.

### ***Does the Flat Tax Help to Improve “Competitiveness”?***

One of the most common arguments of the flat tax proponents, especially when they address non economists, is that it boosts competitiveness. As we showed in this paper, taxes certainly affect economic efficiency, yet they have a limited role in competitiveness. Unfortunately, the concepts of competitiveness and efficiency are often confused or misused in the public debate on taxes.

For this we need to make clear what is understood under “competitiveness” when talking about economies, which is to be distinguished from the firms’ perspective. Competitiveness quite crudely reflects the ability of a country to export more than it imports, meaning that it manages to produce goods that are either relatively better or relatively cheaper than foreign goods.

In this perspective, since tax reforms are meant to be long-lasting, they must be evaluated in the context of a complete price adjustment, and therefore bear no consequences on the competitiveness. In the medium and long run the amount and progressivity of personal income

taxation generally does *not* affect the current account because net wages that constitute the price of labor simply adjust. Higher taxes force net wages to adjust downwards to maintain labor costs in line with productivity and restore the labor market equilibrium. (And if not, a tax reform is certainly not the adequate tool of economic policy to remedy the malfunctioning of the labor market.) In the short run, however, the flat tax proposal could affect competitiveness. As we have seen above, the flat tax on value-added would probably not help Slovenia’s competitive position, on the contrary. As concerns the flat tax on personal income, the result is not obvious, because the question demands a proper analysis of the export industry at the micro level to see who would profit and who would not.<sup>24</sup>

But what economies really do compete for is mobile factors of production – capital and skills. When it comes to capital, a flat tax setting may end up increasing its effective taxation, with consequences presented in simulations of section 2. The skills flow, however, is not embodied in our model, i.e. there is no labor mobility across countries. Is there a role for the tax setting in this context? Before jumping to quick conclusions, we must emphasize a few facts. First, the difference in wages across countries reflects more the difference in overall productivity and has much less to do with personal income taxation. Typically, net wages in Switzerland, Slovenia, Slovakia, China, etc., are multiples of each others, while differences in taxation are measured in percentage points of the wage, making it usually impossible for the tax system to offset the differences in net wages, even with a complete elimination of labor taxes. Second, other factors than net wages are often determinant in the choice to migrate or not, in particular for high skilled labor: social status, family relationships, work opportunities, etc. Statistically, after all, we can hardly detect mass emigration as overall the annual net outflow of Slovenian citizens was about 700 over the last five years.<sup>25</sup> Finally, if taxation of high skilled labor becomes problematic, one should adapt taxes on high skilled workers, but this is different from implementing a flat tax. In respect to this discussion it is interesting enough to note that the promoters of the flat tax in Slovenia propose to keep net wages constant, which of course does not contribute to render Slovenia more attractive for skilled workers.

<sup>23</sup> See Andreoni, Erard and Feinstein (1998) for a review. Also, while Schneider and Ernste (2000) find that higher tax rates are likely to discourage compliance, Friedman et al. (2000) arrive at the opposite conclusion.

<sup>24</sup> Interestingly enough, the sectors where wages are currently highest in Slovenia and whose workers would profit most from personal income tax breaks are: financial intermediation; public administration; education; mining; health and social work; as well as electricity, gas and water supply. Of these, only mining produces a truly tradable good. See SORS (2005) “Structure of earnings statistics in 2003”.

<sup>25</sup> See SORS (2005) “Population”.

#### 4. Conclusions

When deciding on the structure of the tax system, policymakers have to make choices on the interrelated and sometimes conflicting objectives of economic efficiency, welfare and simplicity. The research supporting reform decisions must therefore aim at providing as convincingly as possible evaluations of the expected effect on labor incentives, participation, production potential, welfare and the income distribution of the population. Another important issue concerns the transition effects between two economic equilibria and the possibility to compensate the losers in the reform process.<sup>26</sup> So far, the analysis as set forth by the Committee for Reforms is confined to a demonstration that this proposal is revenue-neutral, which clearly appears to be insufficient to motivate a tax reform. Also, no tax reform should be proposed only by comparing it to the current tax setting, but to all relevant alternatives.

The general equilibrium model simulations show under plausible assumptions that the current Slovenian tax system may be improved, both in terms of welfare and in terms of its impact on the potential GDP. The essential lessons for the tax reform design can be summarized in the following way: first, although the tax burden is partly transferred from labor to consumption in all but one simulation, the most preferred regimes retain some progressiveness on labor income taxation. The optimal tax is the more progressive, the more the individuals are risk averse, the more the productivity distribution is dispersed (risky) and the more individual labor supply is inelastic. Second, to improve participation, and therefore the potential GDP, taxes on low income workers must be taken into consideration. And third, in a small open economy it is particularly dangerous to increase the effective taxation on capital, since a lower investment and capital stock directly affect production, which also affects labor productivity and therefore wages. These results are strongly in line with other analyses of tax experiments found in the literature, which emphasize the importance of low effective capital taxation - crucial especially in a small open economy - and the significance of low average taxes for less skilled workers, essential for improving the labor participation rate.<sup>27</sup>

Note finally that the discussion in this paper is confined to the design of restructuring fiscal revenues in the context of revenue-neutral tax reforms. Much stronger welfare efficiency gains can be generated by a reduction of the tax burden resulting from an increased efficiency of the public sector. However, the results presented in this paper remain valid in that they are suggestive on how and on which tax categories to implement tax decreases so as to maximize welfare and efficiency gains. Yet another possible direction to explore in the improvement of the tax setting is to rethink the system of exemptions and deductions, in line with the well-known tax principle to "broaden the tax base and decrease tax rates". Concerning the reduction of the tax burden, the fact that the gradual elimination of the payroll tax is planned to be partially made possible by reduced government expenditures must therefore be seen as a step in the right direction.

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<sup>26</sup> Proponents of flat taxes often insist on the distinction between taxes and redistribution, arguing that taxation should be the most efficient possible (in their view, flat) and that redistribution should be left to transfers. This is also the idea behind the general deduction in flat tax settings. It is important to understand that the efficiency gains of flattening the tax rates in this context remain valid only if the transfers are lump-sum or means-tested, not income-tested. If income-tested, the system is equivalent to a progressive tax. But if transfers are lump-sum, i.e. the same for all regardless of the personal revenue, there may be significant losses in not efficiently targeting the population in need of redistribution.

<sup>27</sup> As put succinctly in a recent study by World Bank (2005), "the relative tax burden for low wage earners is much higher in EU8 (new EU members) than in EU15 and this is one of the other main concerns given the expected more negative employment consequences of the tax wedge for low-wage income earners (than for higher-wage earners)."

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