

WP/06/298

# IMF Working Paper

---

## Tax, Welfare, and Pension Reforms in Slovenia: Implications for Work Incentives and Labor Participation

*Philippe Egoume-Bossogo and  
Anita Tuladhar*



**IMF Working Paper**

European Department

**Tax, Welfare, and Pension Reforms in Slovenia:  
Implications for Work Incentives and Labor Participation**

**Prepared by Philippe Egoume-Bossogo and Anita Tuladhar<sup>1</sup>**

Authorized for distribution by Juan J. Fernández-Ansola

December 2006

**Abstract**

**This Working Paper should not be reported as representing the views of the IMF.**

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

The labor participation rate in Slovenia has been lower than in the EU-15 (the members states prior to May 2004), particularly for the low-income and older individuals. Using simulations of tax and social benefits and public pensions, the paper shows how the current tax, welfare, and pension systems create disincentives to work among these groups. The paper finds that incentives to retire early are strong for men, especially low-wage earners. The marginal effective tax rates also make it costly for low-income individuals to work and negatively affect the probability of participating. The paper proposes reform measures to enhance work incentives and labor participation, which will be crucial for dealing with population aging and for achieving higher potential growth in Slovenia.

JEL Classification Numbers: E24, E62, H53, H55, I38

Keywords: Labor participation, retirement, pensions, taxation, welfare, Slovenia

Author's E-Mail Address: [pegoumebossogo@imf.org](mailto:pegoumebossogo@imf.org), [atuladhar@imf.org](mailto:atuladhar@imf.org)

---

<sup>1</sup> The authors would like to thank Juan J. Fernández Ansola, Piritta Sorsa, Todd Mattina, Ksenija Maver and seminar participants at the Ministry of Finance of Slovenia and the IMF for their helpful comments. Research assistance by Juan Carlos Flores is gratefully acknowledged.

Contents	Page
I. Introduction.....	3
II. Retirement Incentives in the Public Pension System.....	4
A. Background.....	4
B. Methodology for Simulating Pension Accrual and Implicit Tax.....	5
C. Simulation Assumptions.....	7
D. Simulation Results.....	8
E. Impact of Alternative Policy Scenarios on Retirement Incentives.....	10
F. Policy Implications.....	12
III. Labor Participation and Tax and Benefit Systems in Slovenia.....	13
A. Background.....	13
B. Marginal Effective Tax Rates and Incentives to Work.....	15
C. Empirical Analysis.....	17
D. Impact of Reforms on Work Incentives.....	18
E. Reforms to Increase Labor Participation.....	19
F. Policy Implications.....	21
IV. Conclusion.....	22
Figures	
1. Retirement Incentives in the Slovene Public Pension System.....	23
2. Implicit Tax of Deferring Retiring at Various Wage Levels.....	24
3. Marginal Effective Tax Rates for Selected Individuals.....	25
4. Marginal Effective Tax Rates Faced When Taking Up a Job from Joblessness.....	26
5. Average Effective Tax Rates for Selected Individuals.....	27
Appendices	
I. Public Pensions System Parameters.....	30
II. Life Expectancy.....	31
III. Taxation and Benefits Related to Job Status.....	32
References.....	28

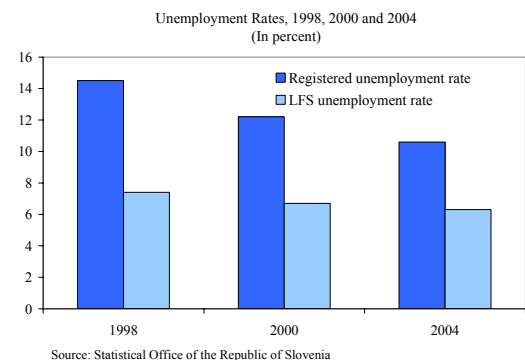
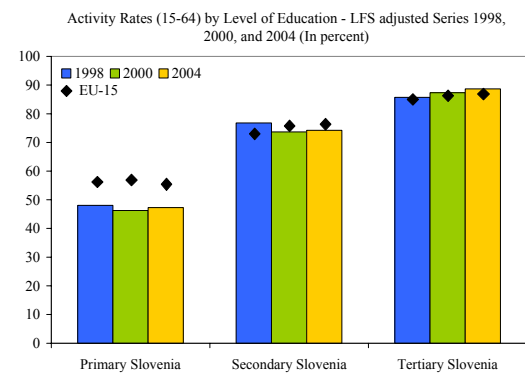
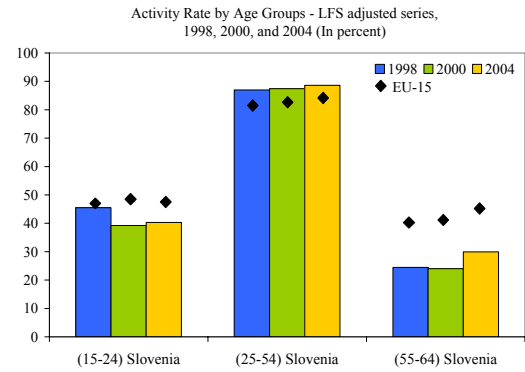
## I. INTRODUCTION

The labor participation rate in Slovenia is very low compared to Europe. This is particularly evident among the very young and the oldest working-age population segments.

Furthermore, a relatively high share of the population with primary education tends to remain outside the labor force, indicating that the participation problem is more acute among the low-wage earners. This has resulted in high welfare spending, contributing to considerable fiscal rigidity and one of the largest ratios of nondiscretionary to total expenditures among the new member states of the European Union.

High taxes and generous benefits are likely to be key factors explaining the lackluster labor participation. The large positive gap between registered and survey unemployment rates partly reflects this problem since registration is a condition for receiving benefits. A large number of registered unemployed are likely not searching for work and therefore would not be counted as unemployed by the survey. The low effective retirement age also suggests that public pension benefits create incentives for early exit from the labor market.

This paper assesses work incentives inherent in the Slovene tax and benefits system, including the public pension system, and reforms that could increase them. In particular, the paper tries to address four key questions: (i) Does the reformed pension system encourage early retirement? (ii) How do marginal effective tax rates (METRs), inherent in the tax and benefit systems, affect the labor participation of low-income individuals? (iii) Is there empirical evidence of METRs affecting the probability of participation? (iv) What possible tax, benefit, and pension reforms can help boost labor participation? The paper is divided into two parts. The first part examines the implicit tax of delaying retirement under the public pension system and analyzes possible reforms to increase incentives to work. The second part analyzes the work incentives under the tax and benefit systems based on METRs; tests for empirical evidence on the role of the METRs on labor participation; and, finally, examines possible alternative reforms to increase participation.

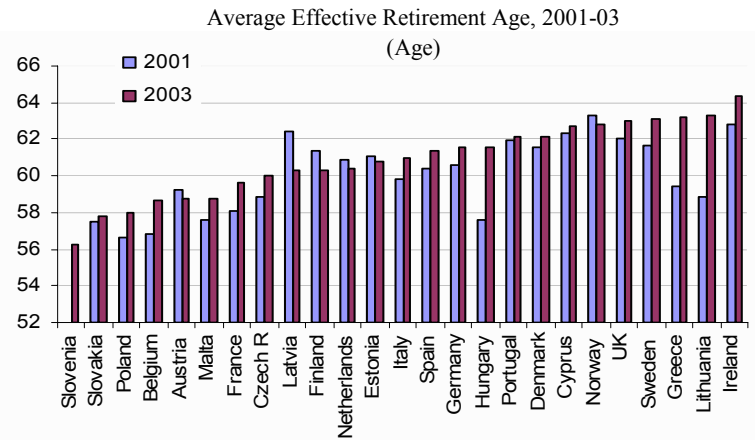


## II. RETIREMENT INCENTIVES IN THE PUBLIC PENSION SYSTEM

### A. Background

The low labor force participation rate among the elderly in Slovenia is consistent with a trend of early retirement. Activity rate for the population aged between 50 and 59 drops sharply from the high levels—higher than that of the EU-15 among women—for the working-age population between the ages of 25 and 49. These early exits from the workforce have led to an average effective retirement age that is the lowest among the EU-25 countries (World Bank, 2005).

Recognizing this problem, the Slovene government approved a pension reform in 1999 that sought to increase working years for the elderly. The full pensionable age of retirement—for which a minimum number of years is required to qualify—was increased and gradually phased in.<sup>2</sup> At the same time, incentives to continue working were built in. Workers can retire earlier, with a penalty, provided a minimum qualifying period of 40 years has been achieved, and they can accrue a bonus for working beyond the full pensionable age. These changes have helped gradually increase the retirement age.



Source: World Bank (2005).

Nevertheless, there still remain concerns about its effectiveness in increasing retirement age over the long run. The newly approved retirement age remains low by current EU-15 standards. Furthermore, a large number of pensioners retire through alternative paths, such as the disability pensions, due to their generous benefits. In 2005, 12 percent of the population aged 55-59 years was on disability pensions. Nearly 4 percent of the new old-age pensioners retired early with a penalty. This situation raises concerns that the newly approved increase in the statutory retirement age may not be binding over the longer term.

Using a simulation of retirement benefits to calculate the optimal retirement age, this paper examines whether the new public pension system provides incentives for early withdrawal from the labor market. The retirement incentive is estimated using the social security wealth accrual methodology, to provide an indicator of possible retirement behavior. This accrual methodology is based on the incremental gains in retirement wealth from one additional year

<sup>2</sup> For men, the 2005 full pensionable age stood at 60 years and 6 months; this is expected to rise to 63 years by 2009 for 20 minimum years of work. Similarly, for women, the full pensionable age as of 2005 stood at 55 years and 4 months and is expected to reach 61 years by 2024.

of work.<sup>3</sup> The analysis also takes into account the literature focusing on more forward-looking measures of incentives which examine retirement incentives based on the evolution of future wealth with additional years of work, not limiting the analysis to an incremental benefit over one year alone. This is because accrual patterns are nonmonotonic, and multiyear accruals can have very different incentives than a single-year accrual. Working beyond the statutory retirement age is then equivalent to buying an option on the more-than-fair actuarial adjustments.<sup>4</sup> An alternative retirement incentive measure which combines the accrual methodology with the option value methodology principles is the peak value measure,<sup>5</sup> which is also used in this paper to supplement the analysis.

## B. Methodology for Simulating Pension Accrual and Implicit Tax

As a first step for the simulation, the pension benefit for an individual is calculated based on pension rules approved under the 1999 reforms. The pension benefits are earnings related, and eligibility depends upon a combination of the minimum qualifying period and age (text table). Workers can retire as early as age 58, provided the minimum-pension-qualifying period of 40 years (38 for women) is met. However, if the years of service—which can be lower than the pension-qualifying period, since the latter can be purchased under specific conditions—are still below 40 (38 for women), a penalty will be imposed depending on the age of the retiree (see Appendix I).

Full Pensionable Age (In years)			
	Minimum Qualifying Period		Minimum Qualifying Period
Men		Women	
58	40	58	38
63	20	61	20
65	15	63	15

Source: Slovene authorities.

The amount of pension benefits depends upon a few key policy variables. They are (i) the **valorization of wages**, which is the method used for assessing wages when calculating the pension base; and, (ii) **the service factor**, which is the rate at which pension benefits are accrued:

- The **valorization of wages** depends upon the *valorization rate* and the time *period used for assessing wages*. In Slovenia, the valorization rate is linked to the rate of pension indexation, which has been lagging wage growth. As a result, it has been a key factor in containing pension expenditure. However, with the reindexation of

<sup>3</sup> These indicators have been used to test whether retirement incentives indeed explain the retirement behavior in the population, after taking into account other social and institutional factors, such as marital status, health, education, and type of employment, that affect retirement decisions. A formal test would require using survey data on workers' work and earnings histories, along with a projection of earnings, to simulate the incremental benefits of retirement at different ages and their distribution. See Hausman and Wise (1985), and Yuan and Yun (2005).

<sup>4</sup> Stock and Wise (1990) have used an option value methodology to calculate the optimal retirement decision as a function of the difference between the utility from retirement today and the utility from an optimal date in the future. This methodology is based on the indirect utility function over work and leisure and calculates the optimal retirement date in the future.

<sup>5</sup> See Coile and Gruber (2000).

pensions to wages, the valorization rate is expected to gradually pick up from its current level. The assessment period for wages is expected to gradually increase from the 10 to the 18 best consecutive years as part of the 1999 pension reforms. This will have the effect of reducing the pension base as lower wage levels are included in the calculation. More specifically, the pension base is the average of the 18 best consecutive years' annual wage assessments:

$$Pension\_base = \frac{\sum_{t=A-18}^A \left( Annual\_wage_t * \prod_{s=t}^A Valorization\_rate_s \right)}{18}$$

where  $A$  is the age of retirement.

- The **service factor** is determined by the *accrual rates*, *years of service*, and *penalty and bonus rates* that provide actuarial adjustments for early and deferred retirement. More specifically, the accrual rate in the Slovene pension system is 35 percent for the first 15 years of service and 1.5 percent for every additional year of service. Depending upon the age of retirement, different penalty and bonus rates would apply as follows:<sup>6</sup>

$$Service\_factor = \begin{cases} \{35 + 1.5 * (Years\_of\_service - 15) * (100 - penalty\_rate) / 100\} & \text{before FPA} \\ \{35 + 1.5 * (Years\_of\_service - 15)\} & \text{at FPA} \\ \{35 + 1.5 * (Years\_of\_service - 15) * (100 + bonus\_rate) / 100\} & \text{after FPA} \end{cases}$$

where *FPA* denotes the date of full pensionable age. The pension benefit is thus obtained as,

$$Pension\_benefit = Pension\_base * Service\_factor / 100.$$

Pension wealth is defined as the present discounted value of expected future pension benefits, conditional on probability of survival. Thus, the estimate of pension wealth is sensitive to the assumptions on *remaining life expectancy*, *pension indexation*, and *the discount rate*. For a married worker, survivor benefits and joint survival probabilities of the worker and dependents would also need to be factored in. Pensions are also taxable in Slovenia. Since pensioners are allowed a higher income deduction, *personal income tax* becomes binding only for those workers earning above the average wage levels, starting at around 150 percent of the average wage. The effective tax schedule used in calculating the net pensions is provided in Appendix I.

---

<sup>6</sup> See Appendix I for applicable penalty and bonus rates.

Pension accrual is the difference in pension wealth due to an additional year of work. In other words, if the pension wealth from retiring next year is higher than the pension wealth from retiring today, then the positive pension accrual implies it is optimal to defer retirement. The extra year of work affects the pension benefits through two channels. First, the *accrual effect* implies that the pension wealth increases when working an additional year because the inclusion of a higher wage—for example, due to seniority—increases the pension base. In addition, a larger service factor due to an additional year of service and a larger bonus or a smaller penalty also increases the accrued pension benefit. Second, the *wealth effect* implies that pension wealth is less since benefits are lost for an extra year. We thus estimate the effective implicit tax on deferring retirement from time  $t$  to the following year:

$$\text{Effective\_implicit\_tax} = \frac{\text{Pension\_wealth}_t - \text{Pension\_wealth}_{t+1}}{\text{Wage}_t} = \frac{-\text{Pension\_accrual}_t}{\text{Wage}_t}$$

A negative value for the pension accrual and a positive effective implicit tax rate thus indicate that the pension system likely provides a strong incentive to exit the labor force. A positive effective implicit tax means that the wealth effect dominates the accrual effect, and vice versa. As an alternative indicator that looks at a longer horizon, we also measure the *peak value*, which is derived as the difference between the pension wealth from retiring at the current date and the maximum value of pension wealth achieved by retiring in the future. The optimal date to retire is when the implicit tax turns positive or the peak value becomes negative.

### C. Simulation Assumptions

For the baseline scenario, we consider a hypothetical male individual who joins the labor force at age 24 and is eligible for full pensions at the age of 63 years (currently being phased in). The following assumptions are used to characterize the earnings history of this worker and to calculate the pension base:

- Over the 40-year working period, wages are assumed to grow annually at the same rate as the economy-wide average wages—5 percent, with real wages growing annually at 2.5 percent and inflation at 2.5 percent—plus a seniority increment rate of 1 percent.
- The rate of valorization—which transforms the wages into the pension base—of past earnings is based on pension indexation and has been varying every year. For simplicity, we set the valorization rate equal to the average economy-wide wage growth in the baseline case, as per the rules effective since 2005. However, pension indexation is still expected to lag wages as the new pension rules on accrual factors and assessment period for calculating the pension base—which also affect existing pensioners under the indexation rule—are phased in; this implies an implicit valorization tax. Hence, an alternative valorization tax rate of 0.77 percent of wage growth is used under sensitivity tests in line with the data observed in 2005.

- Pensions are assessed on the 18 best consecutive years of earnings since 1970. Based on the assumption of a monotonic increase in wages, this corresponds to the last 18 years before retirement. Thus, as an example, the annual assessment of 1000 Slovenian Tolars (SIT) earned 18 years ago will be  $SIT\ 1000 * (1+.025)^{18}$ . Based on this assessment, the pension base will be calculated as the following:

$$Pension\_base = \frac{\sum_{t=A-18}^A \left\{ Annual\_wage_t * \prod_{s=t}^A \left( \frac{Average\_wage_s}{Average\_wage_{s-1}} \right) \right\}}{18}$$

where  $A$  is the age of retirement.

- Under the current pension system, the wage levels used for calculating the pension base do not correspond to the actual net wage because net wage data are not recorded in the system. Instead, a synthetic net wage is used that corresponds to about 63 percent of the gross wage of the individual.
- In calculating the pension wealth, we consider a single worker who survives till age 77, which is the estimated remaining life expectancy for men in Slovenia, conditional on having survived until age 58. See Appendix II for details on life expectancy data.
- We also assume a discount rate of 3 percent and the indexation of pension benefits to nominal wage increases every year. Under alternative scenarios, these assumptions will vary to take into account the existing trend of pension indexation lagging wage growth.
- Pensions are also taxable. The effective tax schedule used in calculating the pension benefits net of taxes is provided in Appendix I.

#### D. Simulation Results

Estimates of pension accrual and the implicit tax show strong incentives for men to retire early. For a man with an expected life expectancy of 77 years and earning an average wage, an additional year of work creates an implicit tax of 2 percent at age 61 and 13 percent at age 62 (figure 1 and text table). Retiring one year later would increase the pensions for two reasons. First, since the final 18 years of earnings are used in calculating the assessment base, an additional year of work would mean that a higher income in the final year is added while a lower income from 8 years ago is deleted, thus increasing the assessment base. Second, an extra year of pension contribution would also increase the accrual factor by eliminating the applicable penalty. But retiring one year later would also have a negative wealth effect, as pension wealth would be reduced due to a loss of one year of benefit. The accrual numbers indicate that the increase in benefits is outweighed by the loss of the additional year of benefit at age 61.

Indicators of Retirement Incentives (In percent, unless otherwise noted)

Retirement Age	58	59	60	61	62	63	64	65
Baseline case (Life expectancy - 77, Male, earning average wage)								
Implicit tax	-34.6	-21.7	-9.3	2.5	13.7	-5.6	12.4	28.7
Peak Value (In Slovenian Tol	120501	59863.1	18883.9	-5421.1	-17991	13611.1	-31645	-77849
Sensitivity Analysis								
Life expectancy - 73	-14.9	-3.6	7.1	17.3	26.7	14.8	29.3	42.0
Life expectancy - 81	-55.9	-41.3	-27.1	-13.4	-0.3	-27.7	-5.9	<b>14.4</b>
Higher discount rate	-20.0	-9.5	<b>0.8</b>	10.7	20.1	3.3	18.8	33.1
Lower discount rate	-54.0	-37.7	-22.3	-7.8	<b>5.7</b>	-16.7	4.5	23.4
No seniority increment	-25.6	-11.7	<b>1.5</b>	13.9	25.6	4.4	23.5	40.6

Source: IMF staff calculations.

Alternative indicators also suggest incentives to retire early. If the worker considers the benefits accrued between age 58 and any year up to the age of 66, the maximum pension wealth would be accrued at age 61, suggesting that this would be the optimal age to retire. One peculiarity is the kink in the implicit tax curve at the age of 63 years. This arises from the nonlinearity of the applicable penalty and bonus rates. For example, under the bonus and penalty rate schedule, the service factor for retiring one year before the full pensionable age of 63 is reduced by 2.35 percent. On the other hand, retiring one year after the full pensionable age raises the service factor by 4.2 percent. Given this large bonus when deferring retirement from age 63 to 64, the implicit tax of deferring retirement drops sizably from the prior year.

The incentive depends significantly on the individual's life expectancy. It is estimated that life expectancy increases on average by a year for every decade. Thus, considering a horizon of 2050, and recalculating pension accrual with a longer life expectancy of 81, the analysis shows that the implicit tax would remain negative until age 64. Similarly, the peak value of pension wealth turns negative only at age 65, suggesting that this is the optimal age to retire. Increasing life expectancy by four years removes the motivation for early retirement; in fact, there is an incentive to defer retirement by a year.

This finding is robust to alternative parametric assumptions. For example, a higher discount rate of 5 percent shows that the optimal retirement age could be advanced by almost a year to age 60. With a lower discount rate of 1 percent, however, the implicit tax becomes positive at age 62. This could be explained by the fact that the larger pension amount accrued from deferring retirement is now worth less in present value terms. These calculations suggest that the incentive for early retirement (before full pensionable age of 63) exists irrespective of the discount rate assumed. Also, when no seniority wage growth is assumed in the earnings history, the optimal age for retirement moves forward to 60 years. Without the seniority increment, the increase in the pension assessment base from deferring retirement is now smaller than in the baseline case.

In the case of a male worker who becomes eligible for retirement by fulfilling the minimum years of service, there is little incentive to defer retirement. We consider a male worker who at age 59 has fulfilled 40 years of service. He is thus faced with the decision to retire with a full pension or defer retirement for a year and accrue a permanent bonus. Other assumptions

are as discussed in the baseline scenario above. Given the bonus system he faces, it is optimal to retire at age 60, a year more than the age at which he is eligible, as demonstrated by the positive implicit tax and negative peak value (Figure 1).

For women, however, the new system does not appear to provide incentives to retire early (Figure 1). We consider a woman earning average wages who at age 58 is eligible to retire, having achieved 35 years of service and purchased 3 further years of service. As in the baseline case, she can retire with a reduced pension or defer retirement to obtain a permanently higher pension. The key differences with the baseline case are the (i) expected remaining life expectancy of 83 years (approximating the average retirement age of 56 years and remaining life expectancy of 26 years as per current data) and (ii) penalty rates. Alternate life expectancies of 78 years (current life expectancy at birth) and 88 years (expected remaining life expectancy in 2050) are also used. In this case, simulations show that the implicit tax of deferring retirement remains negative up to the age of 63, two years beyond the full pensionable age. This is because the higher life expectancy of women creates a stronger accrual effect on pension wealth, rather than the effect of losing one additional year of benefits.

The incentives to retire early are particularly strong for both low- and high-wage earners (Figure 2). A comparison across the wage scale indicates that the incentive to retire increases for workers earning half the average economy wage and those earning more than twice the average wage. The disincentives to work among lower-wage earners can be attributed to the rules ensuring a minimum pension base, which stood at close to 60 percent of the average net wage in 2005. To the extent that the minimum pension base is binding, an additional year of work and the associated increase in wages do not affect the pension base, weakening the accrual effect. As the wealth effect dominates, the incentive to retire early strengthens. Similarly, at the higher end of the wage spectrum, the larger pensions accrued push the income into a higher tax bracket. The increase in the effective tax rate thus negates the impact of higher wages accrued so that the accrual effect is weakened. The implicit tax of retirement deferment rises when the effective tax rate on the pension becomes binding.

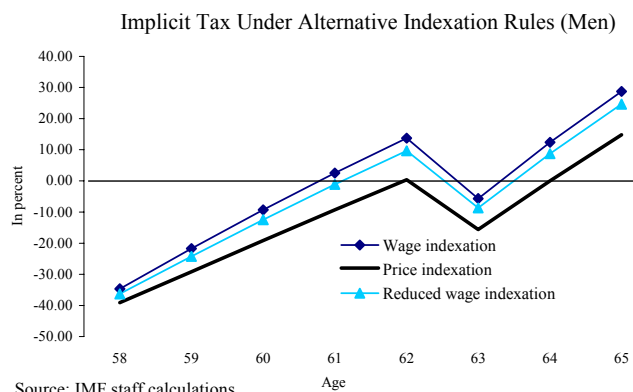
### **E. Impact of Alternative Policy Scenarios on Retirement Incentives**

Retirement incentives depend crucially on the policy parameters in the pension system. The simulations above are based on the parameters approved under the 1999 pension reform. Because these parameters are time varying, as they are still being phased in, alternative scenarios are also considered to analyze the sensitivity to these policies. Furthermore, additional pension reform would still be needed to restore pension viability and improve incentives to remain in the workforce. Some of these policy reform scenarios are also simulated to examine their impact on retirement incentives.

#### **Pension indexation**

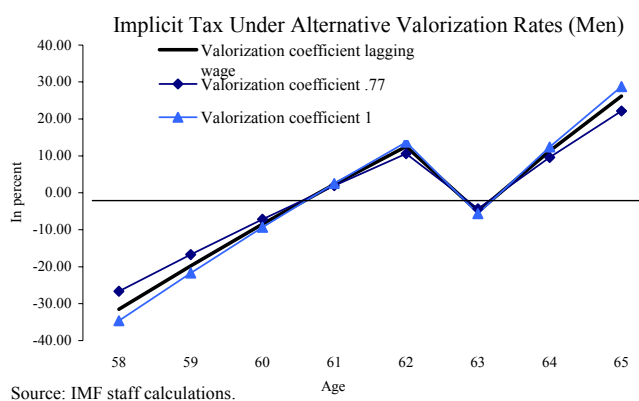
A simulation of alternative indexation mechanisms for pension benefits shows that incentives to retire early are strongest under wage indexation and weakest under price indexation (text figure). This is because, under price indexation, the wealth effect is smaller than the

accrual effect, as the additional year's pension benefits that are foregone are smaller. Similarly, an alternative indexation rule is simulated in line with the current rule that pension growth will effectively lag wage growth.<sup>7</sup> As in the case of price indexation, the accrual effect dominates. The incentives to retire early weaken, and it becomes optimal to retire at age 62.



### Valorization of wage earnings

The rate at which wages are valorized in calculating the pension base does not appear to affect the incentives substantially (text figure). Since this rate depends upon pension indexation—which, in turn, has been lagging wage growth—there is an implicit valorization tax on wages in calculating the pension base. In 2005, this amounted to 77 percent of wages. While the magnitude of the implicit tax changes under the different rates of valorization, the sign of the implicit tax does not change, and the optimal retirement date remains at 61 years—the age at which the implicit tax turns positive and the peak value turns negative.



### Assessment period for pension base calculation

As in the case above, changing the assessment period for calculating the pension base does not have a significant impact. Raising the assessment period from the 18 years assumed in the baseline to 25 years does not change the date of the optimal retirement age (text table). Even though this affects the level of the benefit considerably more than the baseline scenario, the effect on the pension base of working an additional year is very small.

<sup>7</sup> Existing pensioners' benefits are adjusted downward to ensure consistency with the 1999 pension reform measures which lowered benefits for new pensioners, due to the higher number of years used for assessing wages in calculating the pension base and the lower accrual rate. This adjustment is expected to index pensions for existing pensioners at a rate that lags wage growth by 0.065 percent through 2024.

Implicit Tax Under Alternative Policy Scenarios (In percent)

Retirement Age	58	59	60	61	62	63	64	65	66	67
Baseline	-34.6	-21.7	-9.3	<b>2.5</b>	13.7	-5.6	12.4	28.7	--	--
Longer assessment period	-33.5	-21.1	-9.0	<b>2.4</b>	13.3	-5.5	12.0	27.8	--	--
Accrual rate (30 + 1.7)	-38.0	-25.2	-12.7	-0.7	<b>10.7</b>	-8.4	9.9	26.6	--	--
Accrual rate (25 + 1.9)	-41.4	-28.6	-16.1	-4.0	<b>7.7</b>	-11.2	7.3	24.4	--	--
Accrual rate (22.5 + 2)	-43.1	-30.4	-17.8	-5.6	<b>6.2</b>	-12.6	6.1	23.3	--	--
Higher full pensionable age (64)	--	-31.4	-17.9	-5.0	<b>7.3</b>	18.9	0.0	18.5	35.0	--
Higher full pensionable age (65)	--	--	-27.7	-13.6	<b>0.0</b>	12.7	24.7	6.4	25.3	41.7

Source: IMF staff calculations.

### Accrual rate

Changing the accrual rate that determines the service factor can have some impact on retirement incentives. Under the current system, the accrual rate is highly front-loaded, with 35 percent for the first 15 years and 1.5 percent for every additional year of service. If this is changed so that the accrual rate is 30 percent for the first 15 years and 1.7 percent for every year of additional service—which, as in the baseline, maintains the same service factor of 72.5 percent for a man with 40 years of service retiring at age 63—the optimal retirement age rises to 62 years (text table). This suggests that back-loading the accrual rate over time could be useful in increasing the effective retirement age. Changing the penalty and bonus rates would also have a direct impact on the accrual rate. However, these changes would have a more significant trade-off in terms of the amount of pension benefit and cost of pension expenditure.

### Increase in full pensionable age

Raising the statutory full pensionable age does not ensure a higher effective retirement age. It is assumed that the full pensionable age increases from 63 years to 64 years, with a corresponding increase in the minimum pension-qualifying period. In this case, the optimal retirement age, at 62, is still two years ahead of the new full pensionable age. A further increase in the full pensionable age, however, does not change the optimal retirement age. As in the case of a shorter life expectancy, increasing the statutory retirement age for a given life expectancy would strengthen the wealth effect, as benefits can be enjoyed for fewer years. This suggests the need for a careful review of other policies that can affect the incentives to retire even as the statutory retirement age is raised.

## F. Policy Implications

The pension parameters need to be reformed to raise the effective retirement age. With a large demographic shift expected over the coming decades, the role of the pension system in inducing an early exit from the labor market needs to be reviewed to prevent an exacerbation of aging-related spending pressures on the economy. In addition to changing the bonus and penalty rates that have a direct impact on the incentives, more back-loading of the accrual rates would also help to defer retirement decisions. Retirement incentives also weaken more under price indexation than under wage indexation. The simulations also suggest that increasing the assessment period for calculating the pension base can lower pension expenditure significantly without weakening retirement incentives. These changes need to be

considered even if the statutory retirement age is raised, as these early-retirement incentives could make it difficult to raise the effective retirement age.

### III. LABOR PARTICIPATION AND TAX AND BENEFIT SYSTEMS IN SLOVENIA

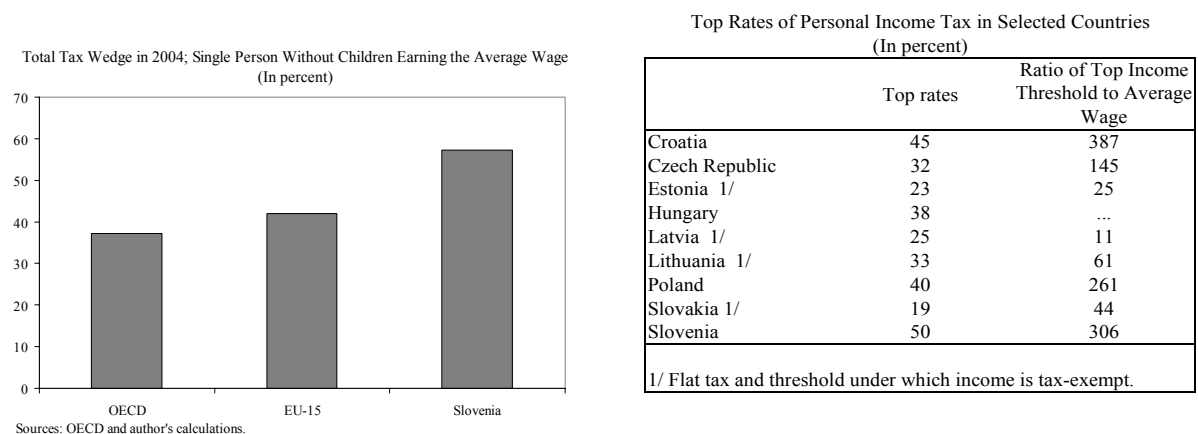
#### A. Background

In Slovenia, low labor participation rates are prevalent among specific groups of individuals, particularly those with poor income prospects. For these individuals, unemployment rates have been higher than among the rest of the Slovene population and employment rates have also been lower than those of peers in the EU-15. Thus, not only do low-income individuals participate less, but also a larger share of those who are active are unemployed. This outcome could be due to a lack of qualifications, high labor costs, and other factors, such as lack of job mobility and fungibility that would limit labor demand. Since participation is weak among individuals with low education attainment (a proxy for income prospects in the labor market), the lack of sufficient incentives is also a strong candidate for explaining this outcome. This situation implies that low-income individuals have high reservation wages due to generous benefits.

This section investigates the role of the tax and benefit policies in discouraging labor supply among low-income individuals, a large share of which may be represented by young workers.<sup>8</sup>

#### Taxation

Labor taxation in Slovenia is among the highest and most progressive in Europe. Taxes include the progressive personal income tax and payroll tax—the latter paid by employers—and social security contributions. The tax wedge is high relative to the averages in the EU-



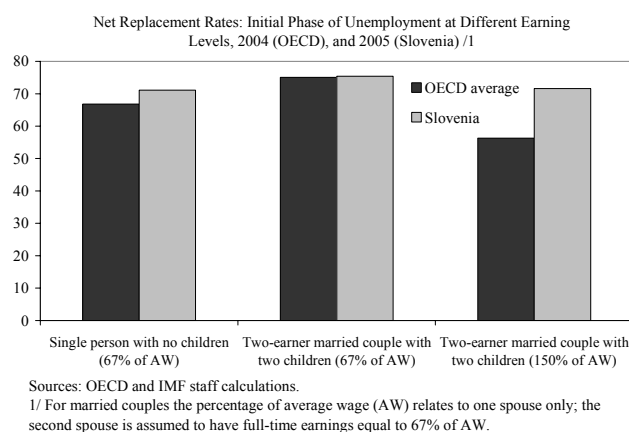
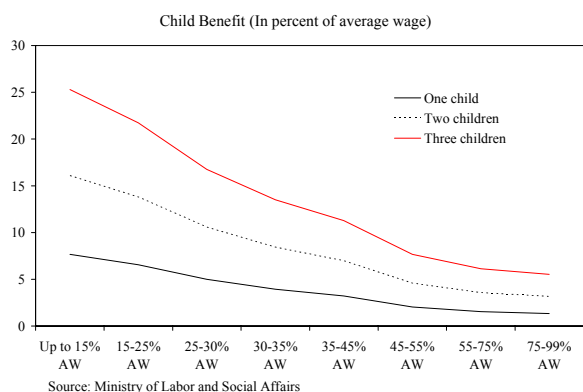
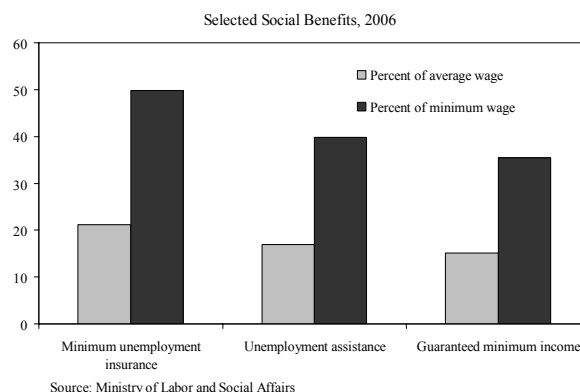
<sup>8</sup> Low labor participation among individuals aged 15-24 may also be due to the “student status.” As hiring young workers as students exempts employers from payroll taxes and social security contributions, it may have led to abuses and under-reporting. However, data to measure the phenomenon are not available.

15 and OECD. Furthermore, the Slovene personal income tax system is very progressive, with the top rate, at 50 percent, among the highest in Central Europe.

The Slovene authorities are planning a tax reform whose aims are broader than increasing labor participation. Their main objective is to decrease tax pressure, particularly for workers at the high end of the income distribution, in order to spur both labor supply and demand. This would be achieved by reducing tax rates and flattening the tax schedule. However, it is not clear that this reform would increase labor supply among low-wage earners as well. Such outcome would depend on how the reform affects the eligibility and amount of benefits, thereby highlighting the importance of reforming the tax and benefit systems simultaneously to create proper work incentives and boost labor participation.

### Social benefits

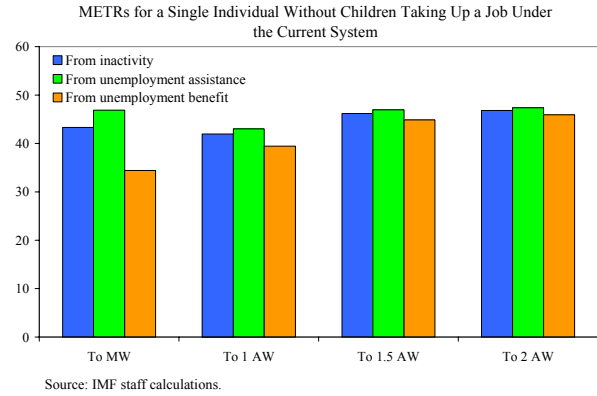
Social benefits, particularly those pertaining to labor income replacement, are also generous.<sup>9</sup> Support to jobless individuals takes several forms. Unemployed workers who have contributed initially receive the unemployment insurance benefit (UB) and subsequently receive unemployment assistance (UA) when the UB runs out. Individuals who do not qualify for these benefits are entitled to a top up in earnings to the guaranteed minimum income (GMI). In addition, individuals or families with children are eligible to receive child benefits, which are inversely related to income levels and increase more than proportionally with the number of children. In terms of work incentives, the main problem for low-income workers is that the difference between the minimum UB and the other two benefits is not large. Moreover, while the UB is taxable and subject to social security contribution, the UA is free of both deductions



<sup>9</sup> See IMF Country Report No. 05/253, Table 8, which provides a comparison of selected benefits (amount and duration) in Slovenia and several EU-25 countries.

(see Appendix III). Thus, individuals who qualify for UA after receiving the minimum UB derive a financial windfall, creating a strong disincentive to work as shown in the calculation of marginal effective tax rates (METRs).

Furthermore, the replacement rate for unemployed individuals with poor income prospects are relatively high in the international context. For example, compared to the OECD, the net replacement rate is higher for a single individual with no children whose income represents 67 percent of the average wage and for a two-earner couple with two children whose principal earner's income amount to 150 percent of the average wage. For a similar couple where the principal earner's income is equal to only 67 percent of the average wage, the net replacement ratio is similar to the OECD's.



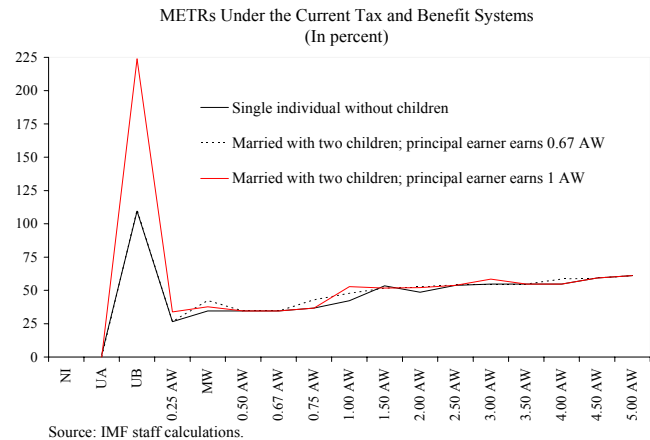
## B. Marginal Effective Tax Rates and Incentives to Work

From a theoretical viewpoint, high marginal effective tax rates (METRs) provide a measure of work incentives. The METR is the change in the combination of taxes paid and benefits received at different levels of income. At the margin, one compares the effective tax rate from one income level  $y_1$  to the next  $y_2$ , therefore obtaining the METR as follows (Carone and others, 2004):

$$METR = 1 - \frac{\Delta y_{net}}{\Delta y_{gross}} = 1 - \frac{[(y_2(1 - t_y - r_{ssc}) + b_2(1 - t_b)) - (y_1(1 - t_y - r_{ssc}) + b_1(1 - t_b))]}{y_2 - y_1}$$

where  $y_1$  is one gross income level and  $y_2$  is the next gross income level;  $t_y$  is the rate of income tax;  $r_{ssc}$  is the rate of social security contribution; and  $b_1$  and  $b_2$  are total benefits at income levels  $y_1$  and  $y_2$ . As the METR measures the percentage of an additional dollar earned that is lost through the interplay of taxes and benefit, it is a key factor in determining the decision to seek work and that dollar. Using this formula, we calculate METRs in Slovenia to evaluate work incentives under the current system.

The current tax and benefit systems produce high METRs, particularly at the lower end of the income distribution. As discussed above, low-income individuals who have exhausted their UB receive a windfall when they become eligible for UA because the amount lost in terms of reduced benefits is more than offset by the gain associated with the exemption

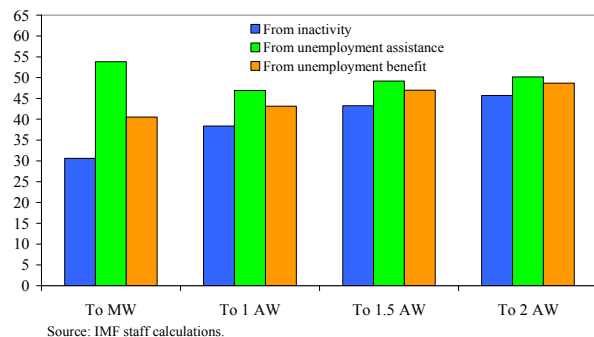


from income taxes and social security contributions. As a result, METRs between the minimum UB and UA exceed 100 percent (and top 200 percent in some cases, text chart).<sup>10</sup> In addition, while the duration of the UB for most people is limited to 6 months, the duration of UA is 15 months across the board.<sup>11</sup> This disincentive is observed by the fact that, over the years, while the number of UB recipients has declined, the number of UA recipients has increased, stabilizing only recently.

The current system also makes it rather costly to exit from joblessness. The combination of progressive tax rates and generous benefits would produce for most people high and increasing METRs when exiting joblessness, depending on the type of benefit they are currently receiving, the salary paid by the job they take up, and their family status. As illustrated in the charts below, most people would face METRs in the range of 30-55 percent, which are quite high and may discourage not only low-income workers but also spouses in families where there is a principal breadwinner. This could explain why female participation is lower than that of males.

From a theoretical point of view, changes in METRs have a substitution and an income effect and the impact on work effort depends on which effect dominates (Ivanova and others, 2005). Whether the substitution effect dominates the income effect or vice versa depends on the individual's position along the budget constraint. If the substitution effect dominates, the lower marginal tax rate would induce a higher work effort in the labor-leisure tradeoff. To the extent that leisure is a normal good, the income effect would tend to reduce work effort. However, when an individual has a choice to be located at discrete points along the budget constraint (corresponding to different levels of work effort), a reduction in the PIT rate that is binding at only one of these points can lead to a large income effect, generating a positive labor supply response from those not directly affected by the change in the tax rate. With these caveats, the following empirical analysis investigates incentives to work as embodied in the METRs.

METR for Married Couple with Two Children where Principal Earner Earns 0.67 AW and Secondary Earner Takes Up a Job under the Current System



<sup>10</sup> Most low-income earners who become unemployed would be eligible for the minimum UB or an amount close, and thus would receive a financial windfall when they exhaust the UB and qualify for UA. In this case, the METR between the minimum UB should be regarded as a marginal effective subsidy that accrues to recipients of UA.

<sup>11</sup> The duration of the UB could reach 24 months for workers over 55 with insurance periods over 25 years. The UA duration could rise to 3 years if conditions for old-age pension were fulfilled during this period.

### C. Empirical Analysis

Is there econometric evidence that METRs affect the decision to participate in the labor market? To answer this question, we use Household Budget Survey data to test the role of METRs on labor participation. In the absence of data on the number of hours worked, standard labor supply model cannot be estimated. Instead, we test whether METRs affect the decision or whether a single spouse, or both spouses will participate. The database is restricted to two types of families: those where both spouses are active and those where only one is active (47 percent of the original database and around 1700 families). Since the data are cross-sectional and individual labor income is not provided, METRs calculated compare the observed situation to a hypothetical situation where the family labor income is zero. Then the probability of belonging to the first type of family as opposed to the second one is estimated as a function of family income (the survey provides labor income as an aggregate for the whole family), individual characteristics, and METRs.

The econometric test is based on a probit model. The model assumes a utility function for a household that is continuous, differentiable, and concave. The household would make the binary decision that both spouses or only one spouse would work by maximizing the expected utility such that,

$$v_H = \max \{EU(I_H^B), EU(I_H^O)\}$$

Where  $B$  is for “both” and  $O$  for “only one” and  $I$ , income. This leads to the following latent variable representing the family’s utility:

$$v_H^* = \begin{cases} EU(I_H^B), & \text{if } EU(I_H^B) \geq EU(I_H^O) \\ EU(I_H^O), & \text{if } EU(I_H^B) < EU(I_H^O) \end{cases}$$

The participation decision is taken with the following probability:

$$v_H = \begin{cases} 1, & \text{if } v_H^* = EU(I_H^B), \text{ both participate} \\ 0, & \text{if } v_H^* = EU(I_H^O), \text{ only one participates} \end{cases}$$

Standard theoretical models relate labor supply to income ( $Y$ ) and individual characteristics ( $X$ ) (Blundell and others, 1998; Moffitt, 2002). For a household, the combined income is crucial, as well as the marginal income as compared to, say, staying at home to care for the children. Therefore, the reduced form model for the latent variable is

$$v_H^* = \alpha X_H + \beta Y_H + \delta METR_H + \varepsilon_H$$

And the probability that both spouses participate in the labor market is given by

$$prob(v_H^* \geq 0) = prob(v_H = 1)$$

$$prob(\alpha X_H + \beta Y_H + METR_H + \varepsilon_H > 0) = \Phi(.)$$

Where  $\varepsilon_H \sim N(0,1)$  and  $\Phi(.)$  is the c.d.f. of standard normal distribution, which can be estimated by maximum likelihood (probit).

The result shows that high METRs are negatively associated with the probability that both spouses participate. A one percentage point increase in the METR reduces the probability that both spouses participate by 2.8 percent. When one controls not only for the number of children, but for the household's members (which may include other dependents as older parents) the probability declines by 3.8 percent. As one would expect, this probability increases with current effective tax rate and the family income, since higher-income families usually pay higher taxes. It also increases with education, as the higher the education attainment, the higher the probability to participate in order to seek return for the high human capital investment made. In contrast, the age of the reference person reduces the probability of joint participation, as older individuals are likely to retire.

#### Determinants of the Probability of Joint Labor Participation in a Two-Parent Family

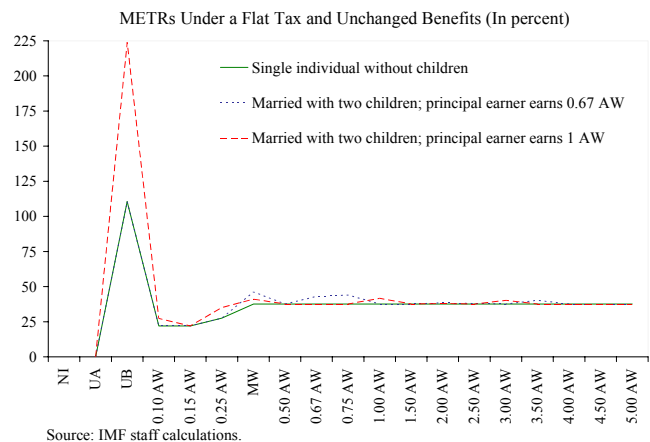
	Coefficient	t-stud	Coefficient	t-stud
Current effective tax rate	0.045 ***	2.87	0.054	3.32 ***
Marginal effective tax rate	-0.028 ***	-2.79	-0.038	-3.76 ***
Total family income	0.006 ***	7.60	0.004	4.78 ***
Age of reference person (RP)	-0.016 ***	-3.43	-0.023	-5.05 ***
Education of RP	0.011	0.92	0.042	3.40 ***
Gender of RP	0.064	0.85	0.075	0.97
Number of children	0.361 ***	6.06	...	...
Number of household members	...	...	0.418	11.31 ***
Constant	-0.346	-1.35	-1.223	-4.49 ***
Observations	1531		1531	
Pseudo R2	0.17		0.22	

\*\*\*, significant at 1 percent.

\*\*, significant at 5 percent.

#### D. Impact of Reforms on Work Incentives

The introduction of a flat tax alone would not improve work incentives for low-income workers. A flat tax of 20 percent has been one of the tax reform proposal considered. Such a reform would significantly improve work incentives for high-income workers by reducing their METRs to around 35 percent (text figure) from current levels of over 60 percent



(for income levels above roughly four times the average wage). However, as participation for these workers is already above EU-15 averages, it is therefore unlikely that this would significantly boost their activity rate (although in terms of hours worked, it might make a difference). In contrast, a flat tax, if not accompanied by other changes, could worsen incentives for low-income individuals because their tax rate would likely increase. METRs for those taking a job would continue to be high, reaching 50 percent for a single individual moving from UA to a job paying the minimum wage. This is precisely the type of individual whose participation is currently low. In addition, the flat tax would raise average effective tax rates for low-income individuals while reducing those of high-income ones (see Figure 3).

Taxable income brackets	Rates
0-minimum wage (42 percent of the average wage)	15 percent
Minimum wage – 2 average wages	20 percent
Above 2 average wages	25 percent

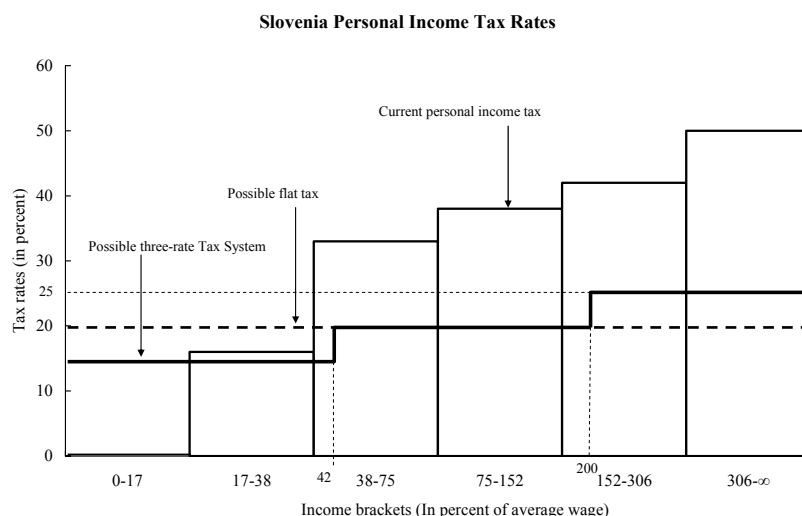
### E. Reforms to Increase Labor Participation

One possible option to reduce marginal tax rates for low-income individuals would be to change the benefits associated with joblessness.<sup>12</sup> Since the main source of the high METRs among low-income workers is the lack of sufficiently large differences between the minimum UB, the UA, and the GMI, this option would be based on the following elements:

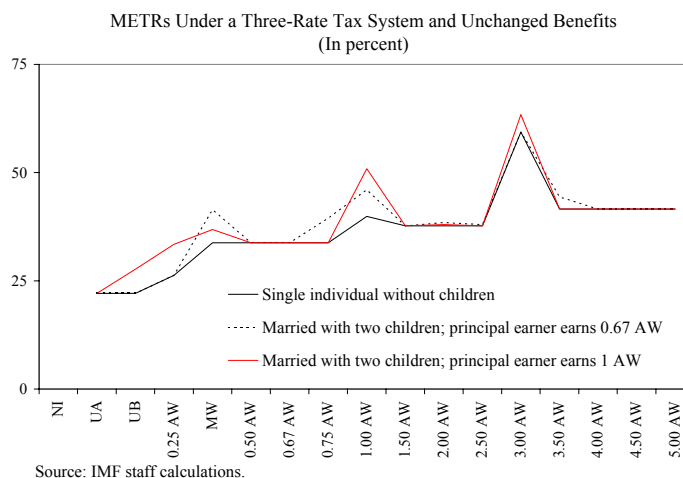
- With regard to benefits, the GMI (currently amounting to 71 percent of the minimum UB) would be left unchanged, as it is linked to the poverty line. The UA would be reduced to half the minimum UB from the current ratio of 80 percent. Since the UA would be smaller than the GMI, it would be regarded as a temporary support that the unemployed could not count on to live a decent life, leading to more intensive job search. An individual who had exhausted his UB would qualify to receive UA and would not be able to opt for the higher GMI during the statutory duration of the UA, which also could be shortened. We assume an unchanged child benefit.
- As an alternative to the flat tax, the Slovene authorities have been considering a tax schedule with two or three tax brackets. The paper considers a possible three-rate system, as described in the table and chart below. A tax rate of 15 percent would target individuals with taxable income up to the minimum wage, representing a slight reduction from the 16 percent most of them face at the moment and cover slightly more people (the current upper income bracket represents 38½ percent of the average wage). The bulk of the working population would face a rate of 20 percent (the figure that is cited most frequently as a possible flat tax rate). Finally, individuals whose taxable income is at least twice the average wage would be taxed at a rate of 25 percent. The general tax exemption, as well as the child tax exemption, would remain unchanged. However, it is assumed that all labor incomes, whether subject to

<sup>12</sup> Another well-known alternative is the earned income tax credit (EITC), which provides a payment to low-income individuals who take low-wage jobs. This scheme reduces their METRs, thus providing a stronger work incentive. In the United States, the introduction of the EITC was instrumental in reducing welfare rolls during the 1990s (Hotz and Scholz, 2000). However, the same authors argued that the scheme succeeded due to the relatively low minimum wage, social benefits, and tax rates in the United States.

the personal income tax or not, would be subject to social security contributions at the current rate of 22.1 percent.



The hypothetical alternative reform of the tax and benefit systems outlined above would strengthen job search incentives for low-income individuals. From the benefit point of view, the reduction of UA and the signal that it is no longer sufficient to depend for an extended period on social support would intensify the search for work. On the one hand, this reform would lead to a decline in the number of UA recipients, which has increased in the face of a decline in overall unemployment. On the other hand, the reduction of the METR (rather than increase under the flat tax) would raise take-home income. As illustrated in the figure, together these reforms could reduce METRs for most people relative to the current system and for most low-income individuals relative to the flat tax proposal. In particular, they would eliminate the spike between the UA and the UB. METRs could be made smoother by adjusting the other benefits (such as the child benefit) and/or various tax exemptions, particularly at the points where tax rates increase.



With the caveat that this is a partial equilibrium analysis, one can draw some lessons by comparing the three systems—the current system, the flat tax system, and the proposed three-rate system—focusing not only on incentives to work but also on fairness of taxation:

- Figure 1 shows marginal effective tax rates for a single individual without children and for a married couple with two children at various income levels of both spouses under

the current system, the flat tax system (a 20 percent flat tax with unchanged benefits), and the three rate system (15-20-25 percent). The latter delivers lower METRs than the former two in the income range up to the average wage. Beyond that point, the flat tax produces lower METRs as one would expect, since no other changes are made to tax allowances and benefits.

- The alternative three-rate tax system would increase incentives to seek work for low-income individuals. Figure 2 depicts METRs when taking a job under the three systems. The cases of a single individual without children and of a married couple where the principal earner earns 67 percent of the average wage are shown here because they are good representatives of individuals with the lowest income levels. Whether taking a job from complete inactivity, from the UA, or from the minimum UB, these individuals or families in most cases, face METRs that are lower under the three-rate system than currently or under the flat tax. This remains the case whether the job found pays the minimum wage, the full average wage, or an income that is up to twice the average wage. Nevertheless, METRs would continue to be somewhat high (up to 40 percent in some cases). Therefore, a careful calibration of other benefits and tax allowance could create a system with lower METRs.
- Figure 3 contains charts of the average effective tax rates (i.e., what percentage of the overall income from labor and the welfare system is paid to the government) faced by various families. As the flat tax system would raise the tax rate of low-income workers, it would generate higher average effective tax rates than both the current and three-rate tax systems. The three-rate system produces consistently lower average effective tax rates than the other systems, with two notable exceptions. First, individuals receiving the UA would face higher effective tax rates. This is consistent with the change designed to give them incentives to seek work. Second, the average effective tax rates would outstrip those of the flat tax at some point owing to the higher tax rate of 25 percent. However, the intersection in most cases happens well beyond income levels equal to twice the average wage, where the tax rate increases. Therefore, higher (around 35 percent) effective tax rates would apply only to individuals who are well off.

## **F. Policy Implications**

This analysis suggests that reforms to improve work incentives should focus on both the tax and benefit systems. Evaluation of marginal effective tax rates generated by a hypothetical 20 percent flat tax with unchanged benefits shows that work incentives for individuals with poor income prospects would worsen. This would defeat the important objective of raising labor participation rates, which is crucial for lifting potential growth. However, an alternative that is also being considered by the Slovene authorities could solve these problems; adopting three fairly low rates of personal income tax and widening the gap between the minimum UB and the UA would lower marginal effective tax rates for most individuals. Work incentives would increase, and average effective tax rates for most people would decline.

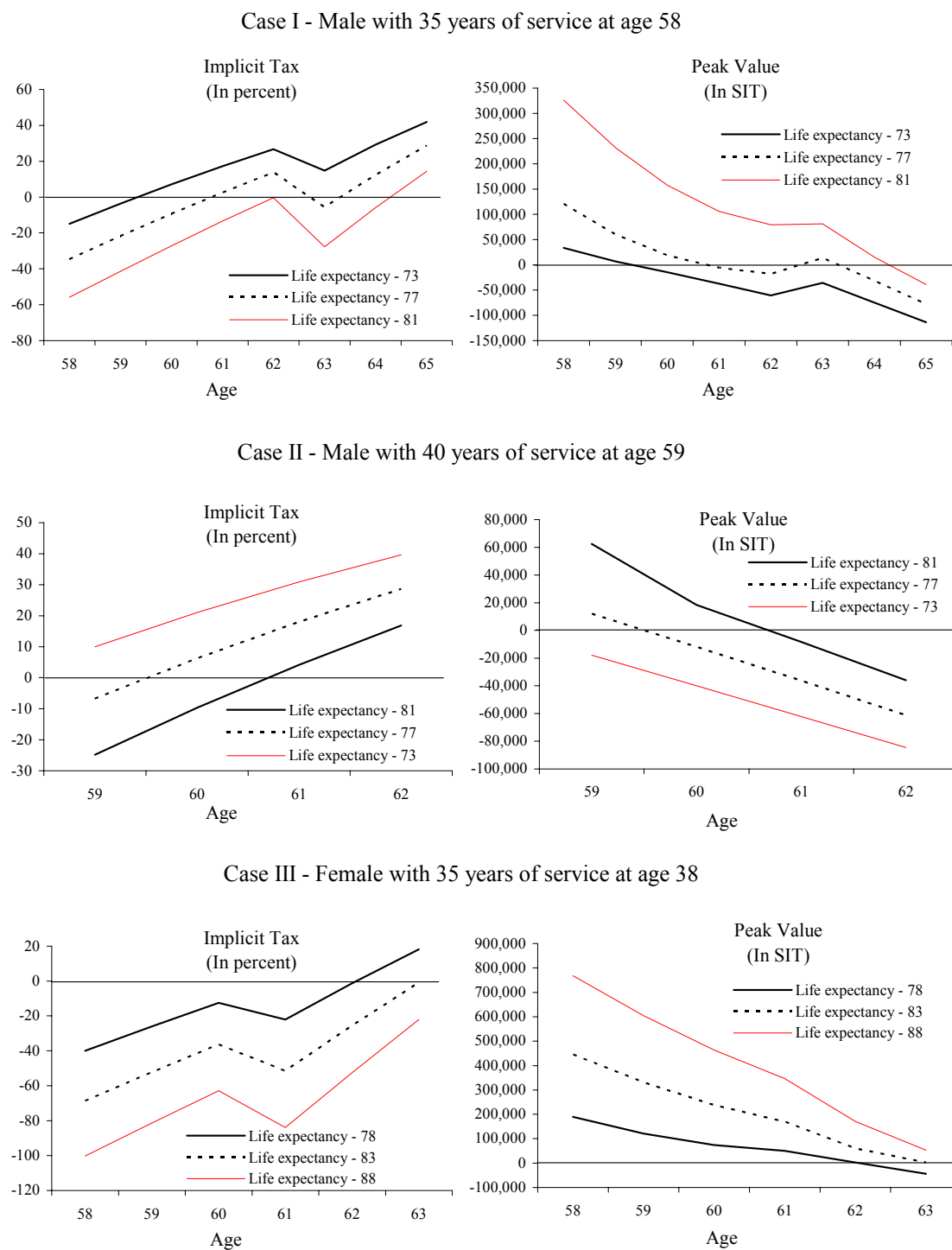
#### IV. CONCLUSION

The labor force participation rate is considerably lower among the elderly population in Slovenia compared to the EU-15 countries. For the older population, this situation reflects the low full pensionable age under the Slovene pension system. Although reforms were introduced to increase the full pensionable age and create incentives to defer retirement, the implicit tax built into the pension system would likely encourage workers, especially men, to leave employment early. The incentives are particularly strong for workers earning at the low and the high ends of the wage spectrum. In order to raise the effective retirement age, parametric changes to the pension system are needed, in addition to raising the statutory retirement age. This will be crucial to prevent an exacerbation of age-related spending pressures as Slovenia goes through a large demographic shift in the coming decades.

The Slovene tax and benefit systems create disincentives to work, and these disincentives explain in part why labor participation in Slovenia is weaker than the EU-15 average, particularly among those with poor income prospects. Furthermore, under the current tax and benefit systems, marginal effective tax rates are high, discouraging labor participation at the lower end of the income distribution. In particular, taking up a job presents an unemployed person METRs that would discourage intensive job search. Empirical evidence, based on household income data, also suggests that the METRs do affect the probability of participation.

Further work taking account of aspects of the welfare system not directly related to job status, as well as other effects of tax and benefit reforms, would be a natural extension of this analysis. Keeping in mind that results in this paper reflect a partial equilibrium perspective, the analysis could be widened to look into the whole spectrum of benefits available in Slovenia and labor demand considerations. Assessing the budgetary impact of the reform would also be crucial before implementation.

Figure 1. Retirement Incentives in the Slovene Public Pension System



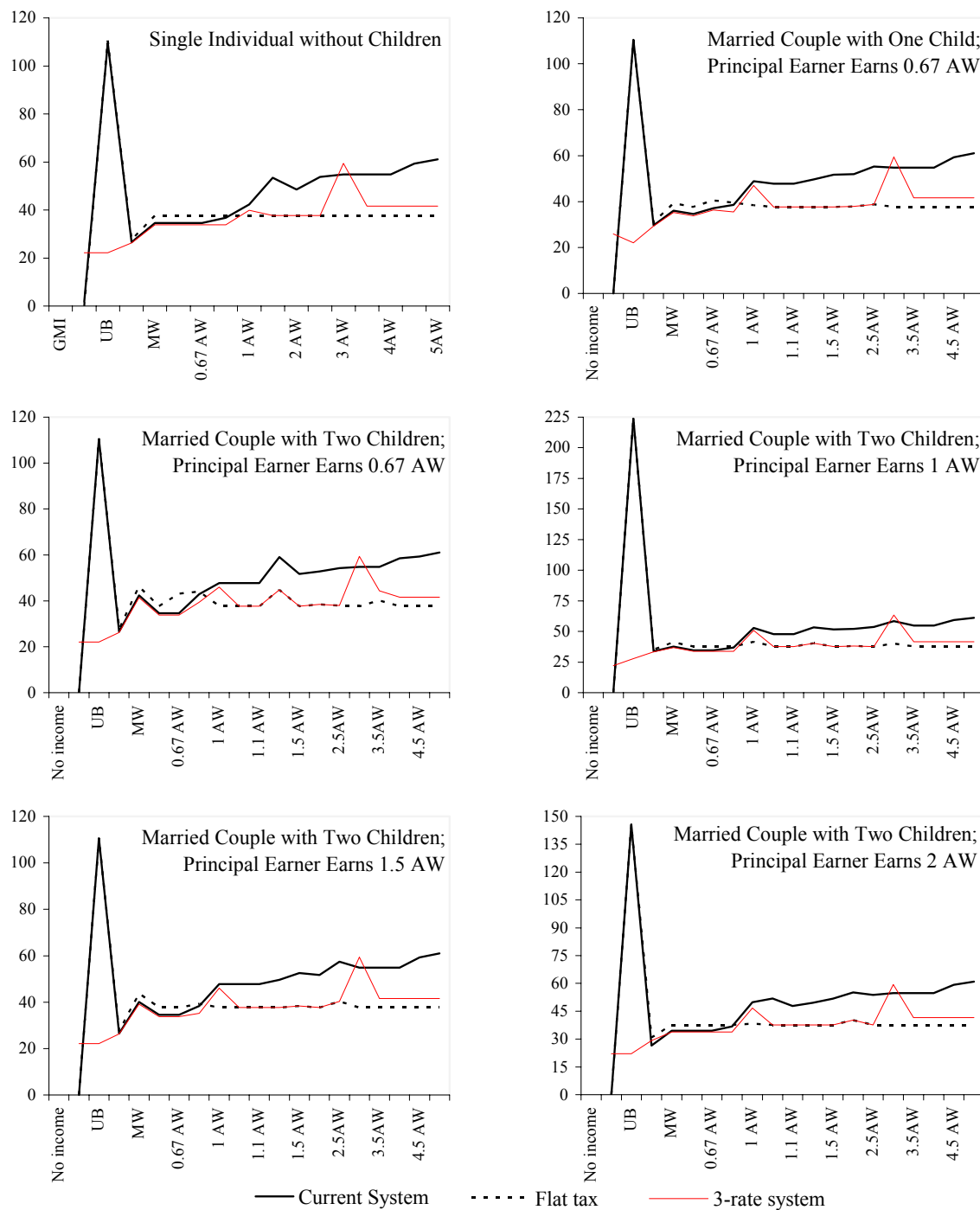
Source: IMF staff calculations.

Figure 2. Implicit Tax of Deferring Retiring at Various Wage Levels  
(In percent)



Source: IMF staff calculations.

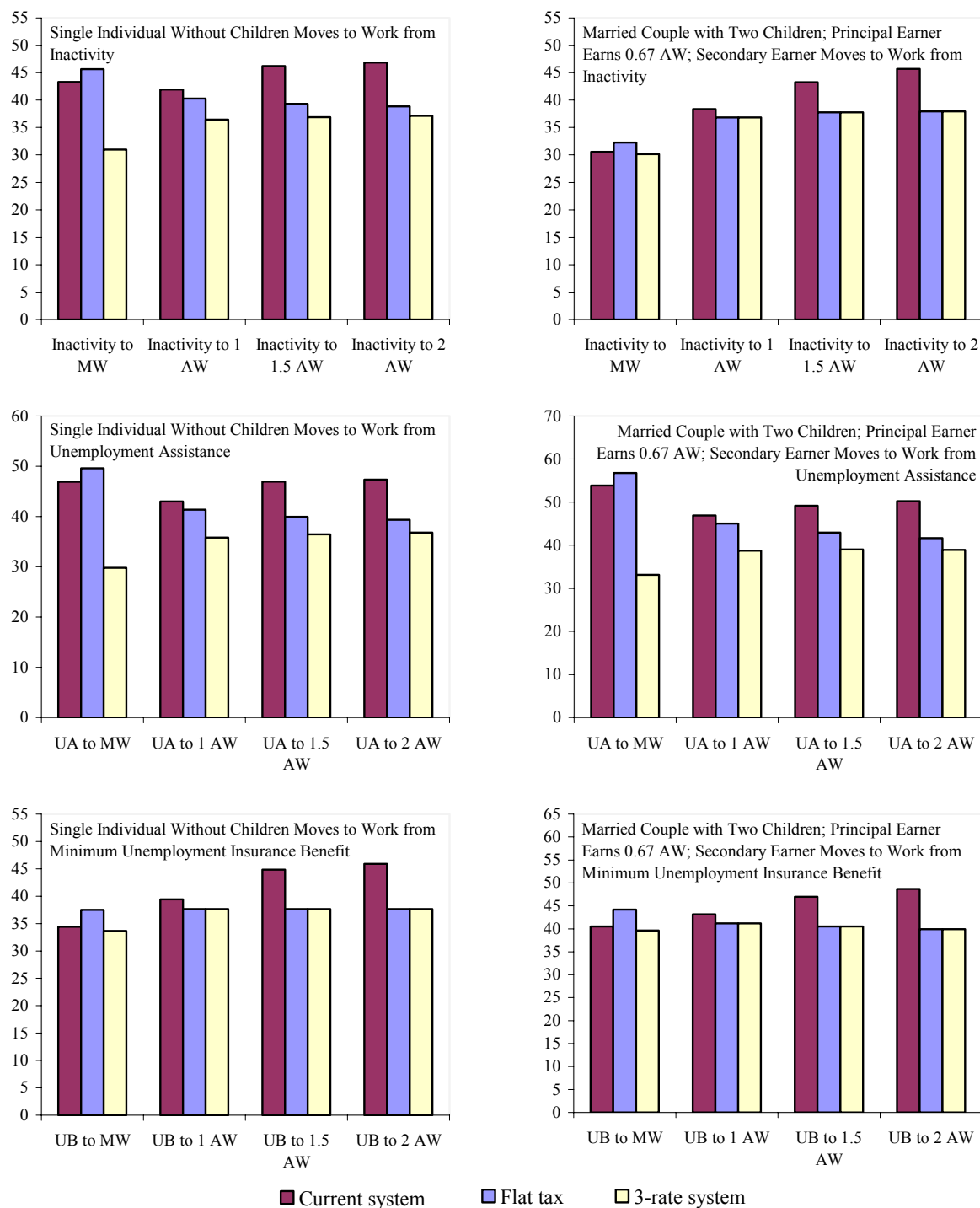
Figure 3. Marginal Effective Tax Rates for Selected Individuals 1/  
(In percent)



Source: IMF staff calculations.

1/ For simplicity of calculations, it is assumed that (i) single individuals who are not eligible for UA receive the full GMI; and (ii) spouses in families where there is a principal earner do not receive the GMI. In couples, the x-axis shows the income of the secondary earner.

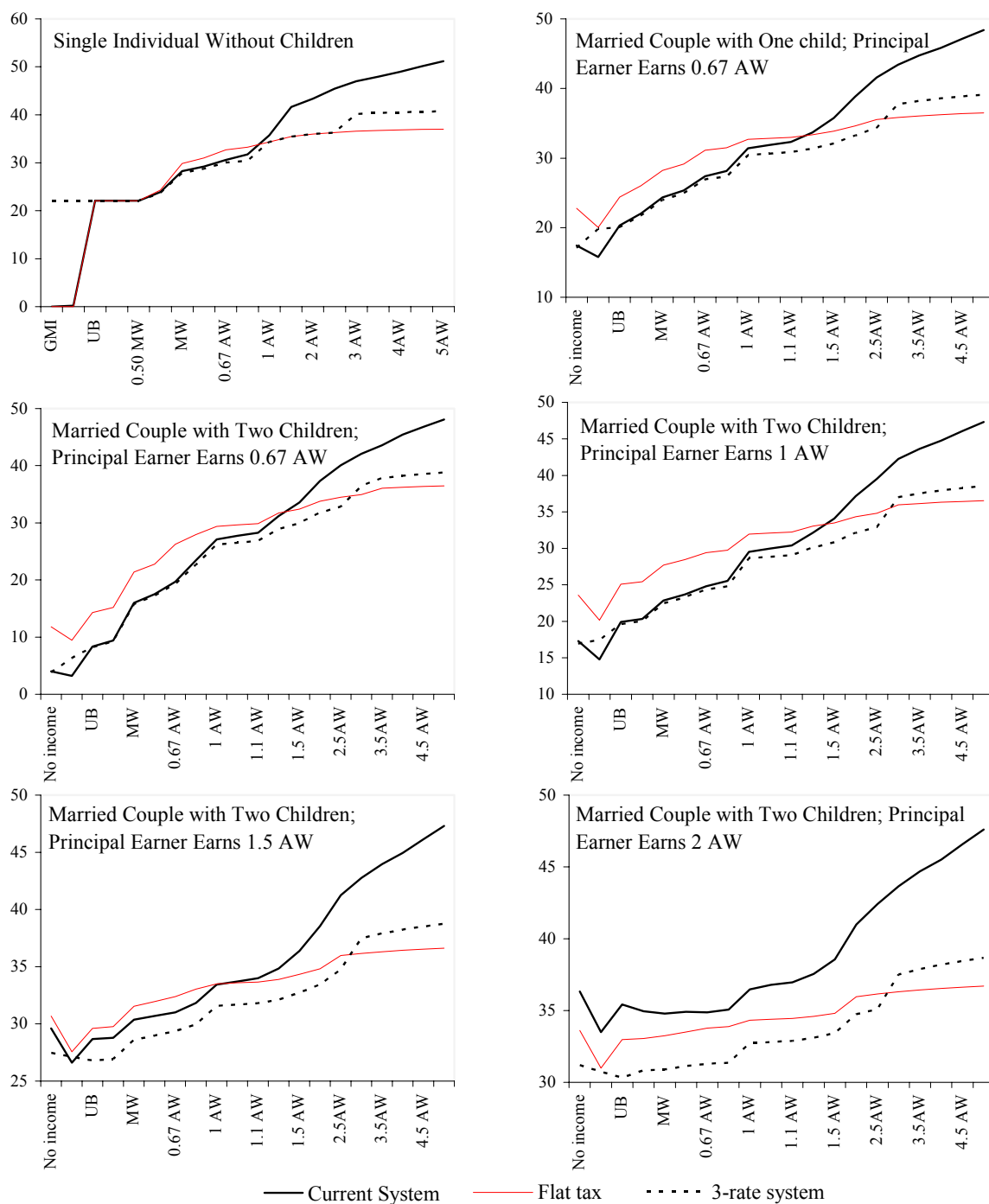
Figure 4. Marginal Effective Tax Rates Faced When Taking Up a Job from Joblessness 1/  
(In percent)



Source: IMF staff calculations.

1/ For simplicity of calculations, it is assumed that (i) single individuals who are not eligible for UA receive the full GMI; and (ii) spouses in families where there is a principal earner do not receive the GMI. In couples, the x-axis shows the income of the secondary earner.

Figure 5. Average Effective Tax Rates for Selected Individuals 1/  
(In percent)



Source: IMF staff calculations.

1/ For simplicity of calculations, it is assumed that (i) single individuals who are not eligible for UA receive the full GMI; and (ii) spouses in families where there is a principal earner do not receive the GMI. In couples, the x-axis shows the income of the secondary earner.

## References

- Blundell, Richard, Alan Duncan, and Costas Meghir, 1998, “Estimating Labor Supply Responses Using Tax Reforms” *Econometrica*, Vol. 66, No. 4 (July, 1998), 827–61.
- Carone, Giuseppe, and others, 2004, “Indicators of Unemployment and Low-Wage Traps (Marginal Effective Tax Rates on Employment Incomes)” OECD Social, Employment and Migration Working Paper No. 18 (Paris: OECD).
- Coile, Courtney, and Jonathan Gruber, 2000, “Social Security and Retirement,” NBER Working Paper No. 7830 (Cambridge, Massachusetts: National Bureau of Economic Research).
- Hausman, J., and David Wise, 1985, “Social Security, Health Status, and Retirement,” in *Pensions, Labor and Individual Choice*, ed. by David Wise (Chicago: University of Chicago Press).
- Hotz, V. Joseph, and John Karl Scholz, 2000, “Not Perfect, But Still Pretty Good: The EITC and Other Policies to Support the US Low-Wage Labor Market,” *OECD Economic Studies*, No. 31, (April, 2000/II), pp. 25–41.
- IMF, 2005, Republic of Slovenia: IMF Country Report No. 05/253 (Washington: International Monetary Fund).
- Institute for Pension and Disability Insurance of Slovenia, *Monthly Statistics Overview 2005* (Ljubljana: Institute for Pension and Disability Insurance of Slovenia).
- Ivanova, Anna, Keen, Michael, and Alexander Klemm, 2005, “The Russian Flat Tax Reform,” *Economic Policy*, July 2005, pp. 397–444
- Moffitt, Robert, 2002, “Welfare Programs and Labor Supply,” NBER Working Paper No. 9168, (Cambridge, Massachusetts: National Bureau of Economic Research).
- Moore, David, July 2005, “Slovakia’s 2004 Tax and Welfare Reforms” IMF Working Paper No. 05/133, (Washington: International Monetary Fund).
- OECD, 2006, *Taxing Wages 2004/2005* (Paris: OECD).
- OECD, 2004, *Ageing and Employment Policies: Czech Republic* (Paris: OECD).
- Stock, James, and David Wise, 1990, “Pensions, the Option Value of Work, and Retirement,” *Econometrica*, Vol. 58, No. 5 (September), pp. 1151–80.
- Tsounta, Evridiki, and Leo Bonato, 2006, “The Tax-Benefit System and Labor Supply in Sweden”, (unpublished; Washington: International Monetary Fund).

- Van Ours, Jan C., and Milan Vodopivec, 2006, “How Shortening the Potential Duration of Unemployment Benefits Affects the Duration of Unemployment: Evidence from a Natural Experiment,” *Journal of Labor Economics*, Vol. 24, (April), pp. 351–78.
- World Bank, 2004, “An Evaluation of the Fiscal Stability of Slovenia’s Pay-As-You-Go Pension System” (unpublished; Washington: World Bank).
- World Bank, 2005, “Special Topic: Sustainability of Pension Systems in the EU-8,” World Bank EU8 Quarterly Economic Report (Washington: World Bank).
- Yuan, Xin, and Kwan Koo Yun, 2005, “Social Security Programs and Retirement Behaviours in Korea and China: A Microestimation” (unpublished; Albany, New York: State University of New York).

## APPENDIX I. PUBLIC PENSIONS SYSTEM PARAMETERS

Penalty and Bonus Rates Under Slovenia's Pension System

Penalties for insufficient years of service			
Men	Age	Women	Age
12 percent	58	9 percent	58
8.4 percent	59	5.4 percent	59
5.4 percent	60	2.4 percent	60
3.0 percent	61		
1.2 percent	62		
Bonus for extended years of service			
Men	Age		
3.6 percent	64		
6.0 percent	65		
7.2 percent	66		
Bonus for extended years of service after qualification for full pensions (40 years)			
3.0 percent	1st year		
2.6 percent	2nd year		
2.2 percent	3rd year		
1.8 percent	4th year		

Sources: Slovene authorities; and World Bank (2004).

Effective Tax Rate on Pensions

Net Pension From Benefit Formula/ Average Net Wage	Effective Tax Rate	Net Pension After Explicit Taxation/ Average Net Wage
50 percent	0.0 percent	50 percent
100 percent	0.0 percent	100 percent
110 percent	1.0 percent	109 percent
120 percent	2.5 percent	117 percent
130 percent	3.8 percent	125 percent
140 percent	5.0 percent	133 percent
150 percent	6.0 percent	141 percent
160 percent	7.0 percent	149 percent
170 percent	7.9 percent	157 percent
180 percent	8.8 percent	164 percent
190 percent	9.4 percent	172 percent
200 percent	10.1 percent	180 percent

Sources: Slovene authorities; and World Bank (2004).

## APPENDIX II. LIFE EXPECTANCY

Estimated Remaining Life Expectancy as a Function of Age								
Estimated Remaining Life Expectancy (Years)								
Age	Men	Women	Age	Men	Women	Age	Men	Women
0	72.2	80.1	30	43.6	50.7	60	17.8	22.9
1	71.5	79.4	31	42.6	49.7	61	17.1	22.0
2	70.5	78.4	32	41.7	48.8	62	16.4	21.2
3	69.5	77.4	33	40.7	47.8	63	15.7	20.4
4	68.6	76.4	34	39.8	46.8	64	15.0	19.5
5	67.6	75.4	35	38.9	45.8	65	14.4	18.7
6	66.6	74.4	36	38.0	44.9	66	13.7	17.8
7	65.6	73.5	37	37.0	43.9	67	13.1	17.1
8	64.6	72.5	38	36.1	42.9	68	12.5	16.3
9	63.6	71.5	39	35.2	42.0	69	11.9	15.5
10	62.6	70.5	40	34.3	41.0	70	11.3	14.7
11	61.6	69.5	41	33.4	40.0	71	10.8	14.0
12	60.6	68.5	42	32.4	39.1	72	10.3	13.3
13	59.7	67.5	43	31.5	38.1	73	9.7	12.5
14	58.7	66.5	44	30.7	37.2	74	9.1	11.8
15	57.7	65.5	45	29.8	36.2	75	8.6	11.2
16	56.7	64.5	46	28.9	35.3	76	8.1	10.5
17	55.8	63.5	47	28.1	34.4	77	7.6	9.9
18	54.8	62.5	48	27.2	33.4	78	7.2	9.2
19	53.9	61.6	49	26.4	32.5	79	6.7	8.5
20	53.0	60.6	50	25.5	31.6	80	6.2	8.0
21	52.0	59.6	51	24.7	30.7	81	5.8	7.4
22	51.1	58.6	52	23.9	29.8	82	5.4	6.8
23	50.2	57.6	53	23.1	28.9	83	4.8	6.2
24	49.2	56.6	54	22.3	28.0	84	4.3	5.6
25	48.3	55.6	55	21.5	27.2	85	3.8	5.1
26	47.4	54.7	56	20.6	26.3	86	3.4	4.7
27	46.4	53.7	57	19.9	25.4	87	3.7	4.8
28	45.5	52.7	58	19.2	24.6	88	3.5	4.4
29	44.5	51.7	59	18.5	23.8	89	3.4	4.1
Source: World Bank (2004).								

### APPENDIX III. TAXATION AND BENEFITS RELATED TO JOB STATUS

**Labor income taxation.** Labor income in Slovenia is subject to personal income and payroll taxes, as described in the tables below. In addition to the general tax allowance to which each individual is entitled, families with children can deduct a child allowance amounting to roughly 14 percent of the average wage for the first child; this allowance declines at a decreasing rate for subsequent children. The payroll tax is paid entirely by the employer. In 2005, the government decided to gradually phase it out (totally by 2009), beginning with a 20 percent reduction in the rates effective January 1, 2006. Social security contributions apply to gross wages at the rate of 22.1 percent for employees and 16.1 percent for employers.

Payroll Tax

Wage brackets (Percent of AW)		Tax Rates 1/
0	59	0.0
59	142	3.0
142	266	6.2
266	+	11.8
1/ Reduced by 20 percent from January 2006		

Personal Income Taxes (in percent of average wage) and Tax Rates (In percent)

(In percent of average wage)			(In percent)
Taxable income brackets	Minimum taxes	Additional income taxed at	
0	< 16.7	0.0	0 General tax exemption.
16.7	< 38.5	0.0	16
38.5	< 75.2	6.2	33 over income equal to 38.5 percent of AW
75.2	< 152.2	18.3	38 over income equal to 75.2 percent of AW
152.2	< 305.8	47.5	42 over income equal to 152.2 percent of AW
305.8	+	112.1	50 over income equal to 308.5 percent of AW

**Benefits related to job status.** The three main benefits related to income replacement when jobless, as certified by registration in the Employment Service, are outlined in the table below. In addition, individuals or families with children are eligible to receive child benefits. The child benefit is inversely related to incomes levels, as one would expect, but also increase more than proportionally with the number of children. The benefits outlined in this chapter do not cover the whole set of social benefits available in Slovenia. For instance, maternity leave and childcare assistance also play an important role. However, those benefits which the chapter focuses on are the ones that affect work decisions directly and are easily tractable for calculating METRs.

	<b>Unemployment Insurance Benefit (UB)</b>	<b>Unemployment Assistance (UA)</b>	<b>Guaranteed Minimum Income (GMI)</b>
<b>Conditions</b>	Minimum 12-month contribution period; registration with Employment Service	Registration with Employment Service	Registration with Employment Service
<b>Eligibility</b>	Unemployed	Unemployed. After rights to UB have expired	Income below the GMI topped up.
<b>Amount</b>	70 percent average monthly earning for first 3 months, 60 percent thereafter.	80 percent of minimum UB	71 percent of minimum UB
<b>Duration</b>	3 to 24 months. For most people, 6 months	Most people up to 15 months. Up to 3 years if old-age pension conditions fulfilled during period	No limit
<b>Tax status</b>	Subject to PIT	Not subject to PIT	Not subject to PIT
<b>Social security status</b>	Subject to SSC	Not subject to SSC	Not subject to SSC
<b>Type</b>	Insurance based	Pure welfare	Pure welfare
Source: Ministry of Labor and Social Affairs.			