

**MACROECONOMIC EFFECTS OF THE PENSION
REFORM IN SLOVENIA**

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WORKING PAPER No. 3, 1999

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INTRODUCTION

There are two articles represented in the Working Paper. In both of them, the central themes are macroeconomic effects which are to be generated by the pension reform.

In the first article, the effects on overall pension due to the foreseen changes in accrual rates and pension base are exposed. The calculations show that these effects will not decrease the pension significantly in 2000 but in 2015 it will decrease for at least 5%.

In the second article the effects of pension reform are not aimed at overall pension but at some key macroeconomic aggregates, as for instance: employment, unemployment, GDP, investment, public debt, etc. The estimations are made with the assistance of macroeconomic model Hermin.

Both presented articles in the Working Paper are the constituent part of the study "The Hermin Macromodel of Slovenia" (Inštitut za ekonomska raziskovanja, Ljubljana, 1999). In either case, the replenishment and enlargement have been done.

ANALYSIS OF THE PENSION - REFORM EFFECTS ON PENSIONS

Slovenian pension system is based on intergeneration compact: the present working population provides pensions for existing pensioners by paying contributions on gross wages (PAYG system). Such a system can function up to the point when pension ratio (pensioners / workers) begins to accelerate. In Slovenia this happened in the period 1985-1991 when the number of pensioners increased while that of working population decreased. The government solved the problem in a very simple way: contribution rate on gross wages was raised to maintain balance in the pension budget. The next shock for the Slovenian pension system happened in 1996, when the government reduced contribution rate on gross wages for five percentage points to reduce labour costs. (It is not clear how successful the measure was in stimulating higher growth of industrial production and export). However, the government had been forced to refund the reduced income to pension budget. The transfer payment from the state budget increased in 1996 by twelve percentage points, just to cover the budget gap. Further reduction of contribution rate in the following two years claimed additional transfers from the state budget (Table 1).

Table 1. Pension budget - revenues (in million SIT and percentage in brackets)

YEAR	1992	1993	1994	1995	1996	1997	1998
Pension Contributions	121,925 (89.050)	192,384 (92.946)	238,466 (91.416)	283,699 (91.982)	280,181 (79.535)	291,637 (71.102)	328,815 (69.871)
Other revenues	14,917 (10.895)	8,172 (3.948)	6,310 (2.419)	4,851 (1.573)	5,357 (1.521)	7,666 (1.869)	8,471 (1.800)
Transfers from state budget	0,075 (0.055)	6,430 (3.106)	16,083 (6.165)	19,878 (6.455)	66,733 (18.944)	110,866 (27.029)	133,320 (28.329)
Total	136,917 (100.00)	206,986 (100.00)	260,859 (100.00)	308,428 (100.00)	352,271 (100.00)	410,169 (100.00)	470,606 (100.00)

A "real" shock in the pension system can be expected in the near future when a new pension reform takes place. In the initial reform proposal the establishment of a three pillar systems, instead of the present unified pension budget, have been foreseen. The two of them would be obligatory in such a way that financial means would be assured through the present contribution rate on gross wages. The first pillar would operate on the existing solution while the second one as a pure capital fund. Approximately 15% of the present contribution rate would be allocated to the capital fund (the second one), and so this fund would be in a position to invest these financial means according to its own judgement (at least 4% profit would be assured, if not by fund then guaranteed by government). There is no doubt that

the pension gap would increase, and again the government would be forced to cover the larger pension gap; simply because the present pension burden will be at least at the present level - more probably even higher. The decreasing dynamics of the worker/pensioner ratio in combination with pension contribution rate support the upper statement (see Table 2). That can be easily proved by this relationship: the percentage of workers contributions in pension budget (PWC) is determined by the pension contribution rate on gross wages (PCR) and by the ratio number of workers per pensioner (RWP). The estimated regression is:

$$\text{PWC} = \begin{matrix} -78,795 & + & 45,704 & \text{RWP} & + & 2,826 & \text{PCR} \\ (-4,87) & & (4,49) & & & (19,36) \end{matrix}$$

$$\bar{R}^2 = .993 \qquad \text{SE} = .850 \qquad \text{DW} = 2,27$$

- Time span of estimation 1992-1998
- PWC - percentage of workers contributions in pension budget (as % of total)
- PCR - pension contribution rate on gross wages
- RWP - ratio number of workers per pensioner
- R^2 - coefficient of determination
- SE - standard error of regression
- DW - statistics

The results are plausible. Pension contribution rate has a significant influence on pension budget; ¹ one percentage point increase of contribution rate decreases the share of state transfers in pension budget for 2,8 percentage points.

The third pillar would operate on capital account and would be voluntary. In fact this type of pension fund is already in function. There are several banks and insurance companies which are offering favourable conditions, i.e. 4% real profit rate.

¹ At this point it has to be emphasised the problem of tax evasion too, referring to some groups of employees. It is well known that employees in small scale business and farmers (approx. 20% of all employees) contribute to a pension fund substantially less than employees in enterprises and companies. The standardised ratio (i.e. per employee) between two groups reaches the multiple coefficient on the behalf of the second group. So, it is a lot of work to be done here, just to reach the more equitable burdening which would at least partially reduce the deficit in pension fund (F. Kuzmin, Kmetje in obrtniki plačajo premalo, Gospodarski vestnik, š t. 8, 1996)

Table 2. Some pension indicators

YEAR /	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of workers (1,000)	945.7	924.0	877.1	841.1	825.9	822.9	830.5	823.5	821.7	823.6 ²
Number of pensioners (1,000)	310.6	384.1	418.9	443.3	451.8	452.4	454.7	457.9	462.9	467.2
Ratio: workers/pensioners	3.045	2.406	2.094	1.897	1.828	1.819	1.826	1.798	1.775	1.763
Pension contribution rate ³ on gross wage ⁴ - %	-	-	28.8	28.8	31.0	31.0	31.0	26.5	24.35	24.35

It seems that all the three partners (Trade Unions, government and employers) in negotiation on pension reform are more than aware of the difficulties and they agreed to abandon the second pillar (at least for some years). But in spite of it the pension reform has to be carried out. And where are the problems? Let us mention four key items:

- the length of working age or old age limit, as a criterion to receive pension,
- the accrual rates,
- the period which is taken into account for calculating the average wage, as a pension base,
- the indexation of pensions, according to wage growth and/or consumer price index.

Ad a)

Up to now, the sufficient condition to receive full pension has been 40 years of work for men and 35 for women. The government's proposal on this matter is to replace the working age by old age limit, i.e. 65 years for men and 63 for women (if by that moment, the working age has been overfulfilled than the pension will be adequately higher). On the contrary, the Trade Union insist on unchanged working age, as the unique criterion to get pension. The issue of negotiation among partners is unpredictable and that is why we are not in position to estimate effects of government's proposal on the overall number of pensioners. In order to capture this and other effects of the pension reform the official predictions (i.e. the predictions for the total number of pensioners and new-entrants) have simply been taken into account. The predictions refer to the period from 2000 to 2015 (Table 3, number of new-entrants).

² Estimate.

³ Pension contribution rate includes employee's and employer's contributions for pensions.

⁴ Gross wage includes net wage, direct tax and employee's contributions to social-security schemes.

Table 3. Projection of new-comers - pensioners

Year of pensioning	MEN		WOMEN		Total number
	Number of new-entrants	Average age	Number of new-entrants	Average age	
2000	9,020	58.5	6,280	55.5	15,300
2001	9,570	58.7	6,780	55.9	16,350
2002	9,950	58.8	6,320	56.3	16,270
2003	8,470	59.0	6,420	56.6	14,890
2004	9,890	59.2	5,640	57.0	15,530
2005	9,310	59.3	7,290	57.4	16,600
2006	8,680	59.5	7,130	57.8	15,810
2007	9,080	59.7	8,320	58.1	17,400
2008	10,040	59.8	7,560	58.5	17,600
2009	11,190	60.0	7,930	58.9	19,120
2010	12,100	60.2	8,480	59.3	20,590
2011	11,630	60.3	9,320	59.6	20,950
2012	12,050	60.5	10,950	59.8	23,000
2013	13,380	60.7	11,120	60.0	24,500
2014	12,290	60.8	12,650	60.1	24,940
2015	12,790	61.0	11,820	60.3	24,610

Source: Bela knjiga o reformi pokojninskega in invalidskega zavarovanja, Ljubljana, 1997.

Because of the fact that new-entrants will enter the pensioner's status under different conditions as those pensioned before the year 2000 we found ourselves forced to decompose the total number of pensioners. The decomposition was elaborated as follows: the surviving persons of each new-entrant's group (i.e. pensioners entering the status in the particular year) in subsequent years (up to 2015) were calculating on the basis of corresponding age surviving rates (different rates for men and women, and corrected when the retired age is not a whole number - linear interpolation). The cumulative number of all the surviving persons represents the number of pensioners entering the pensioner system from the year 2000 and later on up to 2015. By subtracting the cumulative number of new-entrants (i.e. the sum of current new-entrants plus all surviving new-entrants from previous years) from the official prediction of total number we get the number of pensioners who have entered the pensioner system before 2000. The pensions for this group will remain unchanged, according to the pension conditions before 2000. The rules for all new-entrants (entrants in 2000 and later on) are to be changed.

Table 4 presents the estimated number of all the pensioners, divided in pensioners entering the status before 2000 and those entering 2000 and later.

The results of the Table 4 show us that the percentage of new-entrants increases from 3.2% (2000) to 50.2% (2015). Of course this does not mean that 50.2% of all the pensioners in 2015 will have equal benefits. According to pension reform the benefits (pension conditions) will decrease. This means that the pensioners entering the system in 2000 (15,300 pensioners) and surviving up to 2015 (10,696) will be in a better position as those entering from 2001 to 2015. This problem will be elaborated in the subsequent sections.

Table 4. Estimated number of pensioners

Year	Total number	Old pensioners retired before 2000	New-entrants retired 2000 and later
2000	476,236	(96.787) 460,936	(3.213) 15,300
2001	478,993	(93.433) 447,537	(6.567) 31,456
2002	480,557	(90.156) 433,249	(9.844) 47,308
2003	480,135	(87.184) 418,603	(12.816) 61,532
2004	482,218	(84.208) 406,067	(15.792) 76,151
2005	484,001	(81.084) 392,447	(18.916) 91,554
2006	484,807	(78.165) 378,948	(21.835) 105,859
2007	486,698	(75.049) 365,261	(24.951) 121,437
2008	489,670	(72.051) 352,812	(27.949) 136,858
2009	492,682	(68.863) 339,278	(31.137) 153,404
2010	497,799	(65.654) 326,824	(34.346) 170,975
2011	500,626	(62.365) 312,217	(37.635) 188,409
2012	507,749	(59.159) 300,381	(40.841) 207,368
2013	515,010	(55.873) 287,753	(44.127) 227,257
2014	520,852	(52.587) 273,903	(47.413) 246,949
2015	529,479	(49.828) 263,830	(50.172) 265,649

() percentage

Ad b)

The current pension is calculated on the basis of net wages. The full working age (i.e. 40 for men and 35 for women) is a necessary and sufficient condition to receive a pension equal to 85% of one's best ten-year average wage. According to the proposal of pension reform this will be changed in next 30 years. The accrual rate will gradually decrease: each year the pension basis will be lower for 0.5% up to 70% of net wage. So the pension basis for the new-entrants pensioned in 2000 will be 84.5%, for those in 2001 84%, etc.

On the condition that average wages of new-comers are equal to average wages of old pensioners (retired before 2000), than the pension of new-entrants 2000 will be decreased by 0.588%, for those pensioned in 2001 for 1.176% and for the last group (2015) for 9.412%. So each new-entrant group will receive lower pensions compared to the group of previous years. Taking into account the upper correction factors for each new-entrant group⁵ and the unchanged pensions for the persons retired before 2000, the overall pension will be lower. This effect on overall pension depends on the share of old (before 2000) and new pensioners (2000 and later). Such a calculation is presented in Table 5.

Table 5. The effects of lowered pension base on the overall pension

Year	Pension base % of net wage	Correction factor for new-entrants	Total effect on overall pension
1999	85.0	1.0	1.0
2000	84.5	.99412	.99981
2001	84.0	.98824	.99941
2002	83.5	.98235	.99882
2003	83.0	.97647	.99811
2004	82.5	.97059	.99720
2005	82.0	.96471	.99604
2006	81.5	.95882	.99476
2007	81.0	.95294	.99319
2008	80.5	.94706	.99144
2009	80.0	.94118	.98935
2010	79.5	.93529	.98697
2011	79.0	.92941	.98433
2012	78.5	.92353	.98138
2013	78.0	.91765	.97809
2014	77.5	.91176	.97454
2015	77.0	.90588	.97110

⁵ The pension for each new-entrants group (and in subsequent years for the surviving persons from this group) will remain the same.

The results show that the effects will not be spectacular. The overall pension in 2000 will be lower for 0.019% and in 2015 for 2.89%.

Ad c)

The actual pension base is represented by the highest average wage for ten consecutive years. The pension reform foresees significant changes here. Ten years' period will be gradually prolonged up to 25 years; each year one additional year will be added to the calculation of the pension base. So the pension base for the new-entrants 2000 will be weighted by average wage before pension reform (i.e. 122,876. SIT / 1300 DEM⁶) and by that one for 1999 (i.e. 100,495. SIT).⁷ The pension base for the new-entrants 2000 will be 120,841. SIT or 98.344% of the highest wage which was the pension base for the pensioners retired before 2000. If this happens the overall average pension will be lower depending on the share of new-entrants in total number of pensioners. The procedure of calculating these effects on the overall pension is identical to that one of calculating the effects of lowered pension base from 85% to 70% of net wages.

In the Table 6 the effects of increasing period for calculation of the pension base are presented in four variants (separately for each new-entrant group and for all pensioners): in the first variant 0.5% wage increase is foreseen, in the second one 1%, etc.

It seems that the effects of prolonged period on overall pension are not significantly higher in comparison to those ones of lowered pension base. But, nevertheless, the joint effect of both (i.e. the product) will lower the overall pension in 2015 for at least 5% (see Table 7).

⁶ This wage is coming out of the golden wage period 1971-1980 (prices 1988).

⁷ This wage is calculated at 0.5% increase as compared to that one of 1998 (prices 1988).

Table 6: The effects on the overall pension because of the increase in the relevant period for calculating pension base

YEAR	0,5 wage increase		1,0% wage increase		1,5% wage increase		2% wage increase	
	Correction factors for new-entrants	Total effects on overall pension	Correction factors for new-entrants	Total effects on overall pension	Correction factors for new-entrants	Total effect on overall pension	Correction factors for new-entrants	Total effects on overall pension
1999	1.	1.	1.	1.	1.	1.	1.	1.
2000	.98344	.99947	.98381	.99948	.98418	.99949	.98455	.99950
2001	.96998	.99845	.97101	.99850	.97203	.99855	.97306	.99859
2002	.95891	.99709	.96081	.99720	.96272	.99731	.96464	.99742
2003	.94972	.99556	.95267	.99577	.95565	.99597	.95866	.99617
2004	.94203	.99378	.94618	.99411	.95038	.99445	.95465	.99478
2005	.93556	.99169	.94103	.99220	.94660	.99272	.95226	.99324
2006	.93009	.98955	.93700	.99028	.94404	.99102	.95123	.99177
2007	.92547	.98710	.93390	.98811	.94253	.98915	.95136	.99020
2008	.92157	.98458	.93159	.98593	.94189	.98731	.95247	.98872
2009	.91826	.98177	.92996	.98354	.94202	.98536	.95445	.98722
2010	.91547	.97879	.92891	.98107	.94281	.98342	.95718	.98582
2011	.91313	.97568	.92837	.97855	.94418	.98150	.96059	.98453
2012	.91118	.97247	.92827	.97602	.94607	.97969	.96459	.98346
2013	.90958	.96912	.92857	.97346	.94841	.97794	.96914	.98258
2014	.90827	.96572	.92922	.97097	.95117	.97633	.97419	.98193
2015	.91081	.96288	.93451	.96900	.95944	.97537	.98567	.98199

Table 7. Total effects of a decrease in pension base and the increased relevant period for calculating pension base on overall pension

YEAR	TOTAL EFFECTS AT:			
	0.5% wage increase	1.0% wage increase	1.5% wage increase	2.0% wage increase
1999	1.0	1.0	1.0	1.0
2000	0.999280	0.999290	0.999300	0.999310
2001	0.997861	0.997911	0.997961	0.998001
2002	0.995913	0.996023	0.996133	0.996243
2003	0.993678	0.993888	0.994088	0.994287
2004	0.990997	0.991327	0.991666	0.991995
2005	0.987763	0.988271	0.988789	0.989307
2006	0.984365	0.985091	0.985827	0.986573
2007	0.980378	0.981381	0.982414	0.983457
2008	0.976152	0.977490	0.978859	0.980257
2009	0.971304	0.973055	0.974856	0.976696
2010	0.966036	0.968287	0.970606	0.972975
2011	0.960391	0.963216	0.966120	0.969102
2012	0.954363	0.957846	0.961448	0.965148
2013	0.947887	0.952132	0.956513	0.9611052
2014	0.941133	0.946249	0.951473	0.956930
2015	0.935053	0.940996	0.947182	0.953610

Ad d)

Up to the present the indexation of pensions was based on wage movement and consumer price index. Each month the pensions have been fully adjusted by wage or consumer price index.

Since the agreement on pension reform among social partners is still under the way we will examine one of the hypothetical solution - the solution with incomplete adaptation. Such a solution could go along the following lines: the pensions are adapted with wages, not every month but each third month. So the pensions are unchanged for two months and in the third one they are adapted at the level of three months' wage increase. In the fourth and fifth month the pensions are again constant, this time at the level of the third month. The pension of the sixth month captures the increase of wages again, and so forth. It is evident that under such circumstances the pensioners are deprived of two months' increase in each quarter. Let us put the above solution in mathematical form.

If complete adaptation is used than the total sum (yearly) will be:

$$P \cdot i + P \cdot i^2 + \dots + P \cdot i^{12} = P \frac{i \cdot (i^{12} - 1)}{i - 1}$$

If incomplete adaptation is used than the total sum will be:

$$P + P + P \cdot i^3 + P \cdot i^3 + P \cdot i^3 + P \cdot i^6 + \dots + P \cdot i^9 + P \cdot i^{12} = P (2 + 3 i^3 + 3 i^6 + 3 i^9 + i^{12})$$

P = initial pension

i = wage factor (1 + wage increase/monthly)

Comparing both sums we get the correction factor. This factor represents the effects of incomplete pension adaptation on overall pension. In the Table 8 we quote some examples, where different wage increases are used.

Table 8. The effects of incomplete indexation on overall pension

Wage factor - yearly level	Correction factor on overall pension
1.02	.9983641
1.04	.9967016
1.06	.9951612
1.08	.9936297
1.10	.9921259
1.12	.9906602

The effects of incomplete indexation on overall pension are pretty modest; a 12% wage increase would lower the average pension not more than for 1%. Anyhow this practically means that the pension budget would be decreased by 3.5 millions DM per year.

Similar calculation can be made when adaptation is based on consumer price index.

ESTIMATION OF SOME MACROECONOMIC EFFECTS OF THE PENSION REFORM IN SLOVENIA

In this paper the HERMIN model⁸ is used to simulate the effects brought about by the planned pension reform in Slovenia. There exist several distinct variants of the reform to be carried out in Slovenia; in fact, the debate is still going on as to what is acceptable and what not, involving all of the social partners. So let us focus on proposals contained in the *White Book* (1997), the second pillar (mandatory insurance through private pension funds) excepted, for it will not be put into practice. It is not our ambition here to bring in detailed, actuarial evaluations, but rather to have a look at potential impact the reform is likely to have on vital economic policy targets, such as growth, employment, inflation... (absent in actuarial breakdowns).

Problems that Slovenia⁹ (and, indeed, many other countries) is/are facing due to the existing pension system may primarily be explained as a consequence of unfavourable demographic developments. Below is a table illustrating the contribution rates levied on gross employee wages in Germany as opposed to Slovenia.

Table 1. PAYG¹⁰ Contribution Rates System – Germany vs. Slovenia (in % of gross wages)

YEAR	1950	1960	1970	1980	1990	1991	1992	1993	1994	1995	1996	1997	1998
Germany	10.0	14.0	17.0	18.0	18.7					18.6	19.2	20.3	
Slovenia						23.6	23.6	24.9	24.9	24.9	22.1	20.5	20.5

Source: Siebert and our own re-calculations

Data applying to Germany make it clear to what an extent the pension-contributions burden on wages has increased during the last 40-50 years. Because of the political and economic shift made in 1991 there are no data available for Slovenia that could compare with those for Germany in the preceding period. In the last six years contribution rates have been reduced in order to alleviate some of the burden on wages and labour cost. Consequently the Pension Fund found itself in red figures and the deficit had to be financed from the budget (some other taxes had to be re-allocated).

⁸ A detailed structure of the HERMIN type of models is presented in Bradley, Herce and Modesto (1995). The HERMIN model of the Slovenian economy is elaborated in Simonè, Kuzmin, Pfajfar and Potoènik (1999).

⁹ For an explanation of past developments and future prospects of the pension system in Slovenia see the paper by Stanovnik and Kukar (1995).

¹⁰ "Pay-As-You-Go" system: pension payouts based on current insuree contributions.

Amongst other factors, demographic growth has the strongest impact on pension contributions to be paid. It is a fact that in 1991 Slovenia had a 11.3%-odd share of its inhabitants aged 65; expected to go up to 13.6% in the year 2000 and 15.9% in 2005. Unfortunately, the situation in Slovenia became critical regardless of – or in addition to – the demographic aspect just pointed out. Table 2 shows the rising trend of pensions:

Table 2. Number of pensions (in thousand)

YEAR	1981	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
No.	272.7	310.6	321.0	332.5	348.0	365.1	384.1	418.9	448.8	459.3	460.0	462.3	465.4

Ref.: White Book, p. 28

We may observe that from 1991 to 1992 the number of payed out pensions rose by more than 30, 000, thus making the average age of Slovene pensioners¹¹ be:

- 65 years and 2 months (in the category of those retired due to age)
- 60 years and 2 months (retired handicapped)

Moreover, let us state that there were in 1996 (see *White Book*, 1997) 465,420 pensioners (out of which 262,142 old age pensioners, 96,850 invalidity pensioners, 83,113 survivor pensioners, 15,803 farmer pensioners, 4,838 military pensioners and 574 temporary pensioners) as opposed to a total of 763,348 insurees-active population paying pension contributions (out of which 581,651 employed in various companies and organisations, 53,835 employed by private entrepreneurs, etc.). In other words: one pensioner has to be supported by 1.6 employees (i.e. insurees). In some well-developed countries a prognosis has been made that when one pensioner will have to be supported (through contributions) by only two employees (*Economist*, 1996), the existing pension system's crisis will culminate, presumably around 2030; which makes us believe that in Slovenia the crisis has already broken out.

To illustrate what was going on during the last ten years – when retirement was often used also as a social policy tool – let us offer some data concerning the retired elderly people. By having a look at Table 3 it becomes obvious that, in the aforementioned category, the age of retirement fell down sharply in 1990, 1991, 1992 and 1993; old age pensioners of male sex in this period are in between 56 in 58 years old, whereas those of female sex are from 52 to 55 years old. In these years, when the average age of retirement was lowest ever, more than 45,000 insurees retired annually - as compared with an average 20,000

¹¹ June 1998 data, Statistics of the National Pension Administration

throughout the years before the period stated. Pensioning was obviously used to solve unemployment problems too. As we have already pointed out demographic problems will be even more sensitive after 2005.

Table 3. Age of retirement for old age pensioners

TYPE PENSION. YEAR	MEN- ACTUAL AGE	MEN - MIN. LEGAL AGE - YRS OF SERVICE	MEN - MIN. LEGAL AGE - INCOMPL. SERVICE	WOMEN - ACTUAL AGE	WOMEN - MIN. LEGAL AGE - YRS OF SERVICE	WOMEN - MIN. AGE - INCOMPL. SERVICE
1988	58.3		60.0	55.0		55.0
1989	58.3		60.0	55.2		55.0
1990	57.7		60.0	53.6		55.0
1991	56.1		60.0	52.3		55.0
1992	56.2	55.0	60.5	52.5	50.0	55.5
1993	56.2	55.5	61.0	53.3	50.5	56.0
1994	57.6	56.0	61.5	53.2	51.0	56.5
1995	57.5	56.5	62.0	53.1	51.5	57.0
1996	57.5	57.0	62.5	54.0	52.0	57.5
1997	57.5	57.5	63.0	54.0	52.5	58.0

Ref.: White Book, p. 27

Table 4 presents a few main characteristics of the OECD state pension systems.

Table 4. Main characteristics of OECD state pensions

COUNTRY	NORMAL AGE AT RETIREMENT WOMEN / MEN	YEARS REQUIRED FOR FULL PENSION	WAGE TAX FOR PENSION (EMPLOYEES AND EMPLOYERS)	PENSION INDEXATION LINKS:	PENSION TYPE ¹²
Australia	60 / 65	0	-	Prices	MT
Austria	60 / 65	15	22.9	Wages	CR
Great Britain	60 / 65	40	18.8	Prices	CR
Canada	65 / 65	1	4.6	Prices	UF-MT-CR
France	60 / 60	37.5	19.8	Wages	CR
Germany	65 / 65	5	17.8	net wages	CR
Ireland	65 / 65	3	17.7	na ???	CR-MT
Italy	55 / 60	15	26.2	Prices & wages	CR
Japan	65 / 65	25	16.9	Prices	CR
Netherlands	65 / 65	49	15.2	Wages	CR
Spain	65 / 65	15	16.7	Prices & wages	CR
Sweden	65 / 65	3	21.0	Prices	CR-UF
USA	65 / 65	10	12.4	Prices	CR

Ref.: OECD (quoted from Economist, Jan. 1996)

¹² CR - Contribution related; MT - Means tested; UF - Universal flat

Gross wage levies are much like those in Slovenia and Germany, but a few exceptions are to be noted, especially Canada and the States, both having a relatively young population.

It also holds as a rule that the share of public expenditure for pensions in GDP is highest in the countries where wages are most burdened (see table above). So in 1995 this share in Austria and Italy exceeded 14%, and equalled more than 10% in Germany and France; the countries where the adequate share was 6% or less include USA, Ireland, Japan, Canada and Australia (see *Economist*, 1996). Comparable data applying to Slovenia may be found in Table 5.

Table 5. Share of pension & disablement payments¹³ in GDP (in %)

YEAR	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
SHARE	7.17	8.49	9.06	8.20	10.23	11.53	10.75	12.48	12.98	13.42	13.61	13.60	13.77

Ref.: White Book, p. 59

Table 5 makes it clear that the share of paid-out pensions in GDP in Slovenia has increased close to 14%, thus catching up with the figures in Austria and Italy.

Social security contributions act much like the labour tax. Any increase of these contributions results in an increase of labour cost and, on the other hand, decrease of net wage per employee. Increased labour costs are thus tax-wedged. An increase in wage tax (difference between gross and net pay made bigger) lessens the possibility for employees (unions) – through negotiations with employers – to be able to accept a (too) small increase of gross wages. Reasonably enough, employees act in favour of not having their take-home wages cut down. But, since increased taxes may result in an increase in labour cost higher than the one in labour productivity, demand for labour may, as a result, decrease. Thus increased social security levies contribute to growing unemployment and decreased growth of GDP. Hereafter we will try to explain the impact of it all within the existing HERMIN model of Slovene economy.

We will analyse the pension reform in the following five steps:

- (1) For the basic trajectory¹⁴ we present relevant results, especially the public debt development and the (indirect) contribution of the pension fund deficit to public debt.

¹³ Pensioners' health insurance and some other minor contributions are not taken into account.

- (2) Simulation results of the HERMIN model are presented that take into account the pension reform effects, i.e.:
- projected growth of the number of pensioners
 - projected growth of the average pension
- (3) After ascertaining that public debt increase resulting from step (2) is unacceptable, we define public debt ratio (share of public debt in gross national product) which is considered as feasible. The direct tax rate RGTYP is computed that results from exogenising the public debt development.
- (4) In addition to changes taken into account under (3) we decreased the average pension rate by 20 %.
- (5) Steps (1)-(4) take into account indexation of pensions by gross wage rate. Indexation based on price development is more frequent in OECD countries (see Table 4) and less favourable for pensioners. We present simulation results comparable to those from the step (4) but with pensions indexed by private consumption deflator.

Each step is presented in a separate section. Definition of a public debt ratio that is considered feasible and a decrease of the average pension rate by 20 % have been chosen to illustrate eventual macroeconomic consequences. More work should be devoted to finding an acceptable public debt ratio and indexation of pensions should probably be based on a combination of price and wage indices.

1. Some results for the basic trajectory

In Table 6 we present some results that shed some light on the pension fund deficit's contribution to public debt.

¹⁴ Basic trajectory is characterised by an extrapolation of trends for exogenous variables of the model. For a deeper elaboration see Paragraph 6 of the Final Report on the Hermin model (see Simonè et al, 1999).

Table 6. Some results for the basic trajectory

YEAR VARIABLE ¹⁵	1997	2000	2005	2010	2015
Share of GTRSW in GDPFCV	17.7	18.2	25.9	28.9	32.4
Share of pensions in GDPFCV	14.5	15.0	22.6	25.5	28.8
Share of pension contributions in GDPFCV	13.0	13.0	13.2	13.4	13.8
Deficit of the pension fund	1.5	2.0	9.4	12.1	15.0
Cummulative deficit from 1993	1.5	6.9	40.5	95.6	164.8
Public debt share in GNPV ¹⁶	27.0	37.6	66.7	129.6	229.8
Old-age dependency ratio	34.0	34.8	51.6	56.4	61.6

From Table 6 we can observe the following facts:

- the share of social transfers (GTRSW) in gross domestic product has grown from 17.7 % in 1997 to 32 % in 2015
- the share of pensions in GDPFCV has grown from 14.5 % in 1997 to 28.8 % in 2015
- the share of contributions by insurees for pensions is almost constant, in between 13 and 14 % of GDPFCV
- deficit of the pension system as share in GDPFCV has grown from 1.5% in 1997 to 15% in 2015 and the corresponding cumulative debt in 2015 equals 165% of GDPFCV
- the cumulative public debt caused by pension fund deficit accounts for a large part of the total public debt

The basic trajectory reveals that with the existing pension system public debt would further be increased. The main causes for this situation are ageing of the Slovenian population and a generous pension system.

2. Simulation of the proposed pension reform

The pension reform in Slovenia is expected to rely on two pillars, the first one mandatory – ensuring a pension to each insuree –, and the second one optional – through investments in

¹⁵ GTRSW denotes social welfare transfers, GDPFCV stands for gross domestic product at factor cost and GNPV for gross national product.

competing private funds. To summarise, the main changes introduced by the envisaged pension reform are as follows:

- gradual increase in number of years relevant for calculation of pension base,
- gradual increase of minimum age at retirement,
- reduction of the actual rates.

The expected changes are given in more detail by Kuzmin (see the other part of the Working Paper), where some actuarial breakdowns are also included. For our purpose it is enough here to present the summarised effect (see Table 7), resulting from the impact of envisaged changes on average pension. The change is represented as a coefficient; now take this coefficient to multiply with it the existing (1999) pension. This coefficient is based on the presumption that the growth of average net wage per employee in the period under discussion will equal 1.5%. Ratio of the number of pensioners to the total number of older people is also presented in Table 7. Its value is decreased if compared to the value corresponding to the basic trajectory. The number of pensioners is derived from the current situation, the envisaged reform and the existing demographic picture. Let us add that we have not – explicitly – taken into account the migration flows, implicitly included in the projection of population growth.

Table 7. Effects of the pension reform on the average pension rate and the ratio of the number of pensioners to the total number of older people

YEAR	CORRECTION COEFFICIENT FOR THE AVERAGE PENSION RATE	RATIO OF THE NUMBER OF PENSIONERS TO THE TOTAL NUMBER OF ELDER PEOPLE
1997	1.0	1.828
2000	0.999	1.737
2005	0.989	1.611
2010	0.971	1.529
2015	0.947	1.511

In Table 8 we present simulation results based on these changes incorporated into data that defines the basic trajectory.

¹⁶ There is only small difference between GDPFCV and GNPV for Slovenia.

Table 8. Simulation results based on pension reform measures

YEAR VARIABLE	1997	2000	2005	2010	2015
Growth rate for GDPFC	2.3	1.7	1.1	0.6	0.5
Growth rate for CONS	3.7	1.7	1.3	-0.5	-0.4
Growth rate for I	9.6	7.5	1.7	0.6	0.9
Growth rate for L	0.2	-0.1	-0.2	-0.7	-0.7
Unemployment rate	7.7	7.7	6.1	6.1	5.3
Public debt ratio (RDEBT)	27.0	37.3	64.1	119.6	205.3

The main difference - as a result of the basic trajectory - is a lower public debt total. But this decrease is not sufficient and reveals the need for some additional measures.

3. Simulation results based on exogenously determined values for the total public debt ratio

This section offers an idea on what are the changes necessary in direct tax rate (RGTYP) if we want to decrease the ratio of the total public debt to the gross domestic product. In terms of the basic trajectory this debt will have risen up to 230 % of GDP until 2015; if, however, the pension reform measures are enacted it will have risen up to 205 % of GDPFCV. For illustration purposes we have defined a trajectory for the total public debt ratio that ends with approximately 70 % of GDPFCV in 2015. The corresponding simulation results are presented in Table 9. Variables proceeded by PDIF are given in percentage difference to the trajectory values defined in Section 2 (with pension reform measures taken into account).

Table 9. Exogenous public debt ratio simulation results

YEAR VARIABLE ¹⁷	1997	2000	2005	2010	2015
RDEBT	26.6	32.9	45.6	62.3	72.5
RGTYP	0.40	0.44	0.50	0.67	0.74
PDIF(GDPFC)	-0.5	-1.8	-3.8	-10.0	-12.7
PDIF(CONS)	-1.2	-5.4	-11.1	-29.6	-38.1
PDIF(I)	-0.4	-2.0	-4.3	-12.3	-16.6
PDIF(L)	-0.4	-1.7	-3.6	-9.6	-12.3
UR	8.1	9.3	9.5	15.1	17.0

¹⁷ Household consumption is denoted by CONS, investment by I, total number of employees by L and unemployment rate by UR.

Table 9 shows that the total public debt ratio has decreased significantly. In the period until 2015 it will only reach 72.5 %. But the corresponding increase in direct tax rate RGTYP (by feedback rule devised by Bryant and Zhang (1994)) ranges from 0.40 in 1997 to 0.74 in the year 2015. An increase in RGTYP causes a proportionate increase in wages. Increased wages are expected to bring about a deteriorated position in terms of competitiveness and a lower growth of value added in the manufacturing sector. It will also result in labour factor becoming more expensive as compared with capital; likely to introduce substitution of labour by capital and an increase in unemployment rate. All these effects are obvious from Table 9.

4. Simulation results based on a 20 per cent decrease in average pension rate

One of the most direct measures aimed at relieving the wage tax burden is to reduce average pensions in comparison with average wages. This share is relatively high for Slovenia (see Table 10) as compared to some other (see Table 11).

Table 10. Ratio average pension / average wage (all net; Slovenia; in %)

YEAR	1991	1992	1993	1994	1995	1996	1997	1998 ¹⁸
Share	67.0	69.6	67.1	68.4	69.2	67.6	67.3	68.1

Ref.: re-calculations.

Table 11. Average net wages vs. average old age pension ratio in countries compared¹⁹

COUNTRY	AVERAGE NET WAGES (IN DEM)	AVERAGE (STATE-PAID) OLD AGE PENSION (IN DEM)	RATIO OLD AGE PENSION / WAGE
Slovenia	728	509	69.9
Czech Rep.	389	187	48.1
Hungary	476	198	41.6
Macedonia	313	200	64.1
Poland	342	210	61.4
Germany	2680	1900	70.9
Croatia	352	213	60.6
Austria	2104	1473	70

Ref.: White Book, 1997

¹⁸ Taking into account the first ten months' average.

¹⁹ The difference in shares from Table 10 and Table 11 – Slovenia – is due to the fact that Table 10 includes all of the pensions, while Table 11 old age pensions alone.

Average pensions in Slovenia amount to some 70% of (net) wages, indexation being linked to the growth of wages (not prices). The ratio of the average pension and the average wage is considerably higher than in other former socialist countries. Let us mention here that the aforementioned ratio amounting to 48.1% – in the Czech Republic in 1996 – i.e. decreased by 15 percentage points in the years from 1991 to 1996. A desirable option in our case would therefore be to have the ratio brought down to a similar figure. But this is a very sensitive political problem and such a solution is quite unlikely, for the time being, given the current political situation in Slovenia.

Based on data from the Table 11 we will test a scenario whereby the average pension (in constant prices) will be reduced to 80% of the current amount. That results in a ratio of average pension and average net wage in the starting year 1997 being, roughly, 0.55. The results of such a simulation are given in Table 12. Here we can note a growth of the share of total public debt in GNP from 26% in 1997 to 72.6% in 2015. The required increase in direct RGTYP taxation has thus become lower (0.40 in 1997, and 0.65 in 2015) but not enough. The impact on other variables' values has also been reduced. We can therefore conclude that even a 20 per cent reduction of the average pension (in real terms) is not big enough to sufficiently relieve the pension burden on the economy.

Table 12. Simulation results – a decrease of 20 % in average pension rate

YEAR VARIABLE	1997	2000	2005	2010	2015
RDEBT	26.3	31.3	46.4	63.8	72.6
RGTYP	0.39	0.39	0.42	0.60	0.65
PDIF(GDPFC)	-1.5	-1.4	-2.7	-9.3	-11.5
PDIF(CONS)	-5.1	-5.0	-9.1	-28.6	-35.9
PDIF(I)	-2.0	-2.5	-4.3	-12.6	-16.3
PDIF(L)	-1.4	-1.2	-2.5	-8.9	-11.2
UR	9.0	8.9	8.5	14.5	15.9

5. Simulation results for pension rates indexed by private consumption deflator

It is worth underlining that – regardless of the two-pillar system reform – there will remain the problem of the existing pensioners and people still active but for whom one should have to pay contributions under the new system for the years of service already gone by (to make up for the difference, on terms of the new system). In fact this is public debt of the state, either implicit (if not acknowledged) or explicit (if acknowledged, e.g. in the form of

government recognition bonds). In the case of the Chilean reform (*see Edwards, 1996*), carried out in 1981 and serving as a kind of a pension-reform model in the 90's world-wide, the corresponding public debt amounted to as much as 80% of GDP. A rough (restrictive) estimation shows that in Slovenia public debt on account of existing pensioners is higher than 200% of GDP, not to mention the remaining part of debt on account of contributions already paid by workers still active.

All said, it is as yet not clear how – through the reform as envisaged – the national economy will be relieved. As we see it, it could be achieved by the following:

- a substantially lessened re-distributive role of the pension system, meaning that employees with low earnings would receive minimum pensions, and – in turn – the average pension would decrease (in fairly distant future),
- only a limited portion of population would decide to invest (save) in the second, optional pillar, which – again – would result in lower average pensions (distant future),
- reduced pensions – in real terms – because of a prolonged term of service, serving as a basis to calculate the average pay, and then the pension (i.e. reduction of the corresponding coefficient of linking),
- increased age limit of retirement (regardless of the length of service), which – as a result - would bring down the average term of receiving pension,
- and, finally, pensions of current pensioners reduced through linking pensions (mostly) to the price indexation, assuming that the growth of wages will be faster than that of prices.

All of the potential effects of pension reform are expected to be felt – in terms of wage tax reliefs – in a quite distant future. This is, no doubt, important because demographic circumstance are likely to get worse. However, something should be done in the short run as well.

One of the options would be to convert the current liabilities – involving the pensioners and persons still active – to public debt. In our view that would be a good thing to do for several reasons:

- making the situation more transparent before the new pension scheme is enacted,
- making the state behave more rationally in borrowing money, issuing various guaranties, privatising state property and more, all due to the considerably increased (acknowledged or unacknowledged) public debt.

As a matter of fact, the above-mentioned option would have worked better a few years ago. In the years following Independence the state sold off the social housing stock at extraordinarily low prices²⁰. Had these prices been set higher, and sale realised through instalments (see *Kuzmin, Stanovnik, 1994*), money thus earned could have been used to finance public debt on account of the pension reform. In the meantime, the public debt has increased significantly, mainly because of the liabilities on account of former Yugoslav – succession - debts. Transport infrastructure investments also account for a large part of this increase. A great deal of guaranties have in addition been issued for private debt, quite likely to become part of debt to be paid off by the state. The privatisation process itself (has) offered quite a few opportunities to sell off property and thus take hold of a major part of money thus earned to finance public debt due to the pension reform²¹. Frequent argument against such a solution is that financial markets in Slovenia are very rudimentary. But it can be expected that this would also act as a stimulus for a faster development of modern financial markets.

One of the possibilities to ease the burden of pensions for working population is to use price deflators (and not wage growth rate) as indexing mechanism. In Table 13 simulation results based on assumption that pension rates are indexed to private consumption deflator are presented.

Table 13. Simulation results – pension rate indexed to private consumption deflator

YEAR VARIABLE	1997	2000	2005	2010	2015
RDEBT	26.2	30.4	43.3	59.3	67.7
RGTYP	0.39	0.39	0.37	0.50	0.55
PDIF(GDPFC)	-1.5	-1.0	-0.5	-5.4	-7.3
PDIF(CONS)	-4.9	-3.7	-2.4	-17.6	-24.3
PDIF(I)	-1.9	-1.9	-1.6	-7.4	-10.4
PDIF(L)	-1.3	-0.8	-0.5	-5.2	-7.0
UR	9.1	9.1	8.3	13.2	15.1

²⁰ 200,000 'social' – i.e. state-owned - flats. The average selling price equalled about 200 DEM / sq.metre. Had these flats been sold in instalments (over 20-30 let) at, say, 1500 DEM / m2 (a price still favourable), that would enable the State to earn some 16 billion (!) German marks.

²¹ Assets of the Capital Fund of Pension Insurance, established in the process of privatisation, based on mandatory transfer of a 10% share of social (i.e. approximately state) capital within companies, amounting to (merely) some 1.3 billion DEM in 1998, towards the end of the year.

If we compare results in Table 13 to those in Table 12 we observe that direct tax rate is decreased significantly and that the total public debt ratio rises to less than 70 per cent of GNPV in 2015. Influence on gross domestic product (GDPFC), private consumption (CONS), investment (I) and employment (L) is also less severe than in other alternatives.

6. Conclusion

We have pointed out that pension reform in Slovenia is an urgent matter. The measures of the proposed pension reform are of a gradual nature, expected to act in a fairly distant future. The effects of this reform – especially in terms of wage tax reliefs - will be quite modest. A number of opportunities have been missed that could make the reform more rational and effective (selling off state-owned flats, privatisation of social property...). Some positive effects (such as smaller growth of public debt, smaller wage tax burden) could be achieved by a fall in the average pension / average net wage ratio - from existing 0.7 to 0.55 - but this brings about a number of negative effects as well (smaller growth of employment, GDP, disposable income of households, private consumption...). Some positive effects could also be achieved by indexing pensions to price development and not to gross wage growth.

There is no doubt that a reform of the Slovenian pension system is necessary. The effects estimated by the HERMIN model simulations (mainly those presented by the radical alternative from Paragraph 5) show that structural disequilibria are smaller if compared to the present situation. Ex-ante simulations of the model have also brought about many other disequilibria, such as unemployment, low investment, wages, consumption, etc. These problems should be tackled with other instruments of economic policy.

The aim of the paper is not to present alternative measures of the pension reform but only to give some consequences of possible measures for macroeconomic development.

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ANALYSIS OF THE PENSION - REFORM EFFECTS ON OVERALL PENSION

Summary

Slovenian pension reform exposes the following three major problems:

- Working age or old age limit as a criterion to receive old age pension
- Accrual rates
- Calculation of pension base

All foreseen changes will be in force only for new-entrants, entering the pension system after the year 2000. The old pensioners, retired before 2000, will have their pensions unchanged. In such circumstances, the effects of all changes on overall pension depend on the share of new-entrants in total number of pensioners. The calculations show that these effects will not decrease the overall pension significantly in 2000 but in 2015 it will decrease for at least 5%.

ESTIMATION OF SOME MACROECONOMIC EFFECTS OF THE PENSION REFORM IN SLOVENIA

Summary

The proposed measures of the Pension reform in Slovenia are tested with a macroeconomic model of the HERMIN type. It was found that they don't cause really significant effects on macroeconomic development. To illustrate what would be needed if a real impact is intended, some more drastic changes are introduced and tested.