The Impact of the Transition on Wage Determination in Slovenia

by

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I. Introduction

The transition in Slovenia from a market socialist system of wage determination towards a market based rewards system has given rise to considerable labor market reallocations. The purpose of this paper is to present a model in which wages are determined by work effort, and to use this model to explain the increasing gender wage gap following the transition. Following Haveman, Wolfe, Kreider and Stone (1994) we regard mortality rates as being directly correlated with work effort. This enables us to apply the model to explain the changes in work effort brought about by the transition in Slovenia. We argue that the increase in the gender wage gap is ultimately due to increased work effort by males relative to females, the latter being the consequence largely of cultural norms.

Slovenia differs from most of the East European economies undergoing transition in that the transition is not from a centrally-planned economy in which the means of production were effectively owned by the Communist Party leadership. Rather, the transition began in Slovenia in the years immediately following the end of 1988, when wide-ranging reforms were undertaken throughout Yugoslavia. Prior to that time, the Yugoslav economy was of a market socialist type, in which the means of production may be viewed as being in the hands of either the workers – the common view in the Western literature -or of local Communist Party officials (a more common view in the non-communist Yugoslav literature).[1] Regardless of the stance taken on property rights, it seems reasonable to characterize the Yugoslav economy as an imperfect market economy with prevalent soft budget constraints and extensive cross-subsidization of inefficient but politically necessary enterprises. Put simply, an important effect of the reform was to introduce hard budget constraints and bring an end to subsidization.[2] We model the transition as a dramatic decrease in the number of subsidized enterprises, although it should be borne in mind that, by subsidization, we mean all manifestations of a soft budget constraint. The choice to focus on subsidization is, in part, conditioned on the fact that only on this form of a soft budget constraint are data relatively readily available.

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[1] Ribnikar (1997) has even gone so far as to suggest that Yugoslav firms were ownerless!

[2] For a discussion of the reform and its relationship to Slovene independence, see Schnytzer and Sustersic (1996).

Svejner (1996) presents evidence that the employment decisions of firms in transition economies have become responsive to wages. We show that, in addition, Slovene firms have became more sensitive to the quality of labor – in particular, with respect to effort expended by workers.

We proceed as follows. In section II we present a theoretical model which predicts the impact of the transition on the work effort of different kinds of workers. Some empirical observations are presented in section III and a conclusion offered in section IV.

II. The Model

We assume that the utility of workers is a function of their permanent income, I_{ij}, and the effort, e, they make in order to obtain this income. The utility function ,U, is increasing with income and decreasing with effort. For ease of exposition, we assume that under market socialism, effort is the only variable which the worker may use to effect the wage rate, while following the transition, a new variable, q, which denotes the probability of changing jobs and thus measures negotiating power, is added to the utility function. Thus when the impact of the transition on work effort is considered, this variable may be dropped from the analysis.

We denote the utility function of a worker in sector i with a possible shift to sector j by $U(I_{ij}(e,q),e)$. Workers face uncertainty in getting a job. There are four possible states of nature and four different known levels of permanent income which can be raised only by effort. i denotes the sector where the worker is currently employed and j the sector to which he or she might move in the future.

We divide the labor market to 4 groups which are:

1. working in the public sector.

2. working in the subsidized sector.

3. working in the non-subsidized sector.

4. being unemployed or forced to be self employed.

For workers who reached the age of 45, there is a possibility of staying outside the labor market due to retirement. This possibility will change the 4-th group for elder workers to retirement.

The probability to move from one group to another, including the probability of no change in status, is denoted by $P_{ij}(e)+T_{ij}$ since the probability is effected by the effort expended by the worker at the working place, and i = 1,2,3, j = 1,2,3,4. T_{ij} is an exogenous component of the probability. For j = 1,2,3 we know that the probability is increasing in effort, e, whereas for j = 4 the probability decreases with e.

The transition changed the probabilities as the probability to be employed by the subsidized sector fell dramatically. At the same time, the probability to be unemployed or to leave the labor market rose.

Workers maximize their Von-Neumann Morgenstern expected utility and choose e so that:

$$\begin{aligned} F &= \max \sum_{j=1}^{5} \left[P_{ij}(e) + T_{ij}\right] U(I_{ij}(e), e) \\ \text{s.t. } & \sum_{j} (P_{ij}(e) + T_{ij}) = 1 \end{aligned} \tag{1}$$

In consequence of the transition, T_{i2} rises and T_{i4} falls. Consider the effect of this change on effort. In equilibrium:

$$\frac{\partial F}{\partial e} = \sum \frac{\partial P_{ij}}{\partial e} U + \sum (P_{ij}(e) + T_{ij}) \frac{\partial U}{\partial e} = 0 \tag{2}$$

We assume that the second derivative of F is negative so that the second order condition for maximization holds true. It could be argued that part of a worker' s effort is made to raise the probability of staying in the working sector while reducing the probability of moving into unemployment. Thus, we assume that the second term of equation (2) is negative and the first term is positive as effort is expended to change the probabilities in a manner that will increase utility. We use a positive function for U and assume that utility under employment is greater than utility under unemployment. Effort is expended by workers to increase expected utility by changing the probability of their status in the coming period. The decrease in the probability to be unemployed achieved by making more effort

is equal to the increase in the probability to stay in the working sector, so that total change obtained by an increase of effort as expressed by the first term of equation (2) is positive. Effort is made both to maintain working status or to obtain a job, and also to produce income despite the negative direct effect of effort on the utility of workers. An analysis of the components of the utility function of workers reveals that the negative contribution of effort to utility is greater than its positive contribution to income generation and its enjoyment because the effort is expended not only to produce income, but also to keep the job, (for example, by working longer hours than agreed in the contract or by giving private help to the manager):

$$\frac{dU}{de} = \frac{\P U}{\P I_{ij}} \frac{\P I_{ij}}{\partial e} + \frac{\partial U}{\partial e} \tag{3}$$

In order to determine the impact of the transition on effort, we calculate the full differential:

$$\frac{\P^2 F}{\P e^2} de + \sum_j \frac{\P^2 F}{\P e \P T_{ij}} dT_{ij} = 0 \tag{4}$$

The first term of equation (4) is negative due to the second order condition for maximization, while the second term has the same sign as the derivative in equation (3):

$$\frac{\P^2 F}{\P e^2} de + \frac{\P^2 F}{\P e \P T_{i2}} dT_{i2} + \frac{\P^2 F}{\P e \P T_{i4}} dT_{i4} = 0 \tag{5}$$

where it is assumed that:

$$dT_{i2} = -dT_{i4} \tag{6}$$

We are looking now for the sign of $\frac{\P^2 F}{\P e \P T_{i2}} - \frac{\P^2 F}{\P e \P T_{i4}}$, which is equal to the sign of:

$$\frac{\partial U(I_{i2}(e),e)}{\partial e} - \frac{\partial U(I_{i4}(e),e)}{\partial e} \tag{7}$$

If a worker is unemployed or forced to be self employed, then permanent income, I_{i4}, is less than I_{i2} and the marginal utility of income is greater. It thus becomes clear that, assuming a possible state of unemployment (or self employment) workers, who are employed at the present will have greater marginal utility of effort if compared to workers who will stay in the subsidized sector. The direct disutility from the present job, U_2, is the same, but the marginal utility from the permanent income achieved by effort, is not smaller. The contribution of effort in the present job to I_{i4} is greater or equal to its contribution to I_{i2}:

$$\frac{\partial U}{\partial I_{i2}} < \frac{\partial U}{\partial I_{i4}} \text{ and } \frac{\partial I_{i2}}{\partial e} \leq \frac{\partial I_{i4}}{\partial e}$$

Thus, the second term in equation (4) is negative and we conclude that:

$$\frac{de}{dT_{i2}} < 0 \tag{8}$$

We see that young workers who have no chance to retire, could increase their probability of staying employed by increasing their effort. They react to the decline of the subsidized sector by increasing their effort in their job. We thus learn that in the subsidized sector, where the probability to stay in the job falls, young workers increase their effort due to the increasing risk of being unemployed.

Let us now follow the effect of transition on older workers, who believe that due to the decline of the subsidized sector they will be able to retire. Now I_{i4} represents permanent income contingent on retirement.

Equations (5) and (6) hold true, and we have to look for the sign of (7). Workers know that, contingent on future retirement, their marginal utility from effort while still working, will be less than the marginal utility from effort in a state of nature of being employed in the future. (Recall, that this state of nature is denoted by I_{i2}). As long as they still at work, but plan retirement, they suffer mainly the disutility caused by attending their job. They know that additional effort cannot, any longer, increase their permanent income. This is almost guaranteed, assuming retirement will take place soon. Thus, we conclude that

the sign of (7) is positive and the relationship between the change of T_{i2} and effort as calculated in (8) changes sign. Thus, workers who believe that early retirement (fully indexed) is feasible, will decrease their work effort.

Due to the competition in the supply of labor, the decline of the subsidized sector also decreased the probability of obtaining a job in the public and in the non-subsidized sectors. Therefore, following the same reasoning, the young workers in these two sectors also increase their effort while the older workers decrease effort.

The transition was accompanied by inflation. As pointed out by the Orazem and Vodopivec (1997), there is no automatic indexation of wages in Slovenia (only of pensions) and hence compensation of workers is subject to negotiations. Workers now maximize:

$$\sum_j P_{ij}(e)U[I_{ij}(e,q),e] \tag{9}$$

where the power of negotiation is denoted by q. Under inflation, wage negotiations take on an increased importance. First of all, workers demand compensation for the decrease of the purchasing power of money. Usually, inflation is followed by an increase in the variance of prices (for example, see Tsiddon,1993) and the difference in the increase of prices of the different commodities creates a movement of workers from industries that are less profitable to industries which are more profitable. In other words, under inflation, the threat that workers will leave a given job, if not compensated, is greater.

There are natural differences between the genders which are reflected partly by different utility functions and partly by differing probabilities of obtaining employment and differing likelihoods of early retirement. It seems reasonable to argue that in the Slovene family as in most socialist countries, it was very hard to survive with only one wage in a family so women took care of both household and income. Thus, when there was a demand for increased work effort, men were in a better position to provide it. As Klein and Murphy, (1997) have pointed out, work contracts do not generally contain clauses relating to work effort. Within the Slovene cultural context, such an unwritten contract might imply

that employers expect men to make more physical effort at work, do the driving and traveling and to stay longer hours or during the weekends when deemed necessary.

q reflects the probability of finding a better job and, for the above reasons, is usually greater for men than for women. Further, women tend to be less flexible in changing their workplace and location of residence, and are less flexible in the scheduling of weekly working hours.

We can again calculate the optimal effort that maximizes the expected utility in equation (9), find the full differential, and it may be shown that:

$$\frac{de}{dq} > 0 \qquad (10)$$

We thus see that those who can better negotiate for wage increases work harder as they receive greater compensation for their effort and thus are ready to work harder for it. The last relationship thus predicts a growing difference between the genders both in wages and mortality rates over time.

III. Some Empirical Notes

In the previous section, a number of hypotheses regarding, inter alia, work effort were derived from the model. In this section, we use data on mortality rates as a surrogate for effort. This approach finds empirical support in the work of Haveman, Wolfe, Kreider and Stone (1994), who found that in the USA physically and mentally demanding jobs decrease the health status of white men in the labor force. This perhaps trivial finding shows that increased effort results in increased mortality.

1. According to Table 1, subsidies fell by 30%, although this may be an understatement of the impact of the transition on the Slovene economy since there were reductions in 1989, as to the extent of which we have no data. The decline of the subsidized sector is expressed in our model by a fall in T_{i4}. According to our model, this decline increased the risk of unemployment and increased effort of the younger workers.

We see in Table 2 that between 1991 and 1995 the GDP increased by 7%. At the same time, the number of workers fell. Table 3 shows that half of the women aged 55-59

who were in the labor force before transition left after 1991 and the same is true for men aged 60-65. Participation of younger people whose age was less than 25 also fell. These data suggest strongly that the decreased number of workers made more effort to obtain the GDP growth which we observe after 1993.

2. Orazem and Vodopivec (1997, Table 1) show that workers with 20 years or more experience faced an increased probability of leaving the labor market. This finding together with the data shown in Table 3 show that elder workers with either less physical ability or lower quality of labor services, faced a decrease in the demand for their labor services and left the labor force.

3. The increase in effort expended by workers who did not retire early has resulted in an increase in the mortality of men aged 20-45 since 1991. On the other hand, boys and older men benefited from a decline in mortality. Further, women of all ages generally benefited from a decline in mortality. The process of increased mortality of men in the labor force differs markedly from the changes in mortality of men in countries with similar development levels but not undergoing transition.

4. Table 1 shows that the gap in the average wage of men and women grew from 13% in 1991 to 18% in 1995. This happened despite the fact that the relative level of education of women was higher and has risen and that women leave the labor force younger, at the age of 50 (OECD Report and our Table 3). On the other hand, more woman were unemployed (Orazem and Vodopivec 1995), which would tend to drive down women' s wages.

We explain the increase in the gap by the different response of women to the demand for more effort in the place of work. A la Becker, man is responsible to provide the inflow of income and is ready to expend more effort for it. Despite the relatively low wage of women, given equal education, (Orazem and Vodopivec,1997, in their Table 3 p.900), more women were unemployed (Orazem and Vodopivec,1995). Employers preferred to pay more to men as they expected them to provide more effort while working. This process forced more young women into to high education after the transition. (We see in Table 3 that more women than men are outside the labor force, most of them in universities). The relative deterioration in women' s wages brought more of them to invest in their human capital.

5. With no indexation of wages (OECD report and Orazem and Vodopivec 1995 p. 225), negotiating skills took on increased importance. Now, the negotiating power of men is stronger, as they are more flexible with respect to job location. Thus, the nominal wage of women was more rigid and hence, their relative wage fell as inflation went on. Inflation was relatively lower in 1995, and the gap between genders stabilized in that year.

IV. Conclusions

In this paper we have presented a theoretical model to explain the changes in wage determination brought about by a transition from market socialism to market capitalism. We have derived a series of hypotheses in terms of work effort and activity rates.

1.Effort in work increased and for men we observe an increase in mortality.

2. For women we see more investment in human capital .

3. Elder workers retired after transition.

4. The gap in wages increased between genders due to the difference in effort at work. Inflation increased the gap over time since men perform better in wage negotiations and as a result, they made more effort at work, and this process continued over the years. The eventual decline in the rate of inflation stabilized the gap.

V. References

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Table1: Wages and Inflation

Year	GDP	Subsidies (% of GDP)	Inflation	Men's Average Wage	Women' Average w age	Ratio
1990	1182	3.2	549.7	..		..
1991	1077	2.7	117.7	18868	16712	1.129
1992	1018	2.5	201.3	56642	49913	1.135
1993	1047	2.1	32.3	84482	73000	1.157
1994	1103	2.3	19.8	104536	88853	1.176
1995	1146	2.2	12.6	124263	105664	1.176

Source: Slovenia in Figures, Ljubljana, 1997

Table 2: Age Specific Mortality Rates

A. MEN

AGE:	0-6	7-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 +
YEAR														
1986	0.0022	0.0004	0.0010	0.0015	0.0015	0.0021	0.0027	0.0043	0.0068	0.0117	0.0193	0.0266	0.0399	0.0944
1987	0.0020	0.0003	0.0009	0.0019	0.0015	0.0020	0.0028	0.0050	0.0071	0.0131	0.0209	0.0291	0.0393	0.0943
1988	0.0018	0.0003	0.0009	0.0015	0.0015	0.0018	0.0031	0.0044	0.0069	0.0118	0.0181	0.0267	0.0412	0.0948
1989	0.0015	0.0003	0.0009	0.0017	0.0014	0.0018	0.0028	0.0041	0.0064	0.0111	0.0185	0.0266	0.0365	0.0961
1986-1989	0.0075	0.0013	0.0038	0.0066	0.0059	0.0078	0.0114	0.0177	0.0271	0.0477	0.0769	0.1090	0.1570	0.3796
1990	0.0016	0.0003	0.0008	0.0014	0.0014	0.0016	0.0022	0.0038	0.0064	0.0101	0.0183	0.0252	0.0364	0.0976
1991	0.0016	0.0003	0.0010	0.0018	0.0015	0.0017	0.0031	0.0043	0.0065	0.0099	0.0168	0.0259	0.0371	0.0983
1992	0.0014	0.0002	0.0009	0.0017	0.0014	0.0022	0.0029	0.0041	0.0061	0.0098	0.0164	0.0273	0.0385	0.0978
1993	0.0012	0.0002	0.0009	0.0017	0.0014	0.0022	0.0029	0.0044	0.0046	0.0061	0.0098	0.0164	0.0273	0.0385
1994	0.0011	0.0002	0.0010	0.0016	0.0016	0.0021	0.0037	0.0053	0.0068	0.0101	0.0191	0.0202	0.0467	0.0847
1991-1994	0.0053	0.0009	0.0038	0.0068	0.0059	0.0082	0.0126	0.0181	0.0240	0.0358	0.0622	0.0897	0.1496	0.3193

B. WOMEN

AGE:	0-6	7-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 +
YEAR														
1986	0.0017	0.0002	0.0003	0.0004	0.0007	0.0006	0.0009	0.0021	0.0027	0.0048	0.0068	0.0107	0.0186	0.0721
1987	0.0017	0.0001	0.0005	0.0004	0.0005	0.0009	0.0012	0.0016	0.0032	0.0050	0.0070	0.0114	0.0174	0.0735
1988	0.0015	0.0002	0.0004	0.0005	0.0005	0.0007	0.0010	0.0016	0.0026	0.0045	0.0072	0.0105	0.0189	0.0714
1989	0.0013	0.0002	0.0004	0.0005	0.0005	0.0006	0.0011	0.0018	0.0031	0.0042	0.0067	0.0102	0.0166	0.0704
1986-1989	0.0061	0.0007	0.0017	0.0018	0.0022	0.0028	0.0042	0.0072	0.0116	0.0184	0.0277	0.0428	0.0715	0.2874
1990	0.0011	0.0002	0.0003	0.0005	0.0004	0.0006	0.0010	0.0017	0.0024	0.0041	0.0060	0.0095	0.0163	0.0736
1991	0.0010	0.0001	0.0003	0.0003	0.0005	0.0005	0.0010	0.0017	0.0030	0.0047	0.0065	0.0102	0.0168	0.0757
1992	0.0012	0.0002	0.0004	0.0004	0.0004	0.0006	0.0011	0.0017	0.0032	0.0042	0.0059	0.0102	0.0156	0.0727
1993	0.0009	0.0001	0.0003	0.0005	0.0004	0.0007	0.0011	0.0017	0.0027	0.0042	0.0064	0.0110	0.0158	0.0737
1994	0.0011	0.0002	0.0004	0.0005	0.0005	0.0007	0.0011	0.0018	0.0027	0.0041	0.0062	0.0095	0.0182	0.0688
1991-1994	0.0042	0.0006	0.0014	0.0017	0.0018	0.0025	0.0043	0.0069	0.0116	0.0172	0.0250	0.0410	0.0665	0.2908

Source:

Table 3: participation in the Labor Force

MEN

Age	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Year											
1985	0.3214	0.7784	0.9191	0.9284	0.9109	0.9005	0.8858	0.8055	0.5763	0.2262	0.0634
1986	0.3156	0.7802	0.9172	0.9326	0.9166	0.8995	0.8848	0.8083	0.5866	0.2085	0.0668
1987	0.3150	0.7834	0.9155	0.9362	0.9213	0.8991	0.8831	0.8128	0.5812	0.1995	0.0945
1988	0.2988	0.7788	0.9136	0.9393	0.9254	0.8988	0.8819	0.8121	0.5826	0.2045	0.1043
1989	0.2824	0.7770	0.9126	0.9417	0.9289	0.8968	0.8777	0.8078	0.5398	0.1747	0.1455
1990	0.2497	0.7696	0.9100	0.9436	0.9320	0.8954	0.8726	0.8045	0.4938	0.1527	0.1248
1991	0.2469	0.7641	0.9095	0.9452	0.9346	0.8948	0.8653	0.8006	0.4191	0.1167	0.0718
1992	0.2339	0.7467	0.9081	0.9437	0.9358	0.9018	0.8599	0.7756	0.3552	0.0715	0.0187
1993	0.2262	0.7543	0.9065	0.9411	0.9362	0.9078	0.8542	0.7532	0.2882	0.0531	0.0498
1994	0.2203	0.7489	0.9033	0.9400	0.9372	0.9133	0.8556	0.7471	0.3102	0.0616	0.0474
1995	0.1996	0.7467	0.9007	0.9393	0.9407	0.9185	0.8616	0.7593	0.3576	0.0638	0.0242

WOMEN

Age:	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
Year											
1985	0.2870	0.7907	0.8874	0.8870	0.8661	0.8294	0.7634	0.5450	0.3198	0.1704	0.2450
1986	0.2969	0.7825	0.8903	0.8950	0.8710	0.8340	0.7727	0.5465	0.3269	0.1560	0.3041
1987	0.2773	0.7744	0.8932	0.9022	0.8752	0.8385	0.7797	0.5421	0.3195	0.1659	0.2860
1988	0.2601	0.7664	0.8960	0.9087	0.8792	0.8423	0.7879	0.5544	0.3074	0.1352	0.2886
1989	0.2384	0.7597	0.8998	0.9144	0.8826	0.8442	0.7908	0.5164	0.2864	0.1571	0.2833
1990	0.2144	0.7461	0.9013	0.9197	0.8857	0.8458	0.7914	0.4760	0.2663	0.1767	0.2383
1991	0.1990	0.7348	0.9053	0.9244	0.8885	0.8476	0.7881	0.4217	0.2115	0.1712	0.1689
1992	0.1817	0.7209	0.8992	0.9253	0.8963	0.8529	0.7687	0.3989	0.1583	0.1415	0.1615
1993	0.1735	0.7095	0.8922	0.9261	0.9016	0.8582	0.7428	0.3533	0.1356	0.1647	0.1841
1994	0.1662	0.6926	0.8852	0.9271	0.9066	0.8646	0.7595	0.3813	0.1297	0.1403	0.1945
1995	0.1736	0.6790	0.8784	0.9284	0.9144	0.8717	0.7834	0.4223	0.1280	0.1368	0.1914

Source