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Evolution or Revolution?
Disparities in Earnings and Household Income in the Czech Republic 1988-2002

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Abstract:
This paper draws on income surveys covering the period 1988-2002 to illustrate the changes in inequality of earnings and household incomes, the main factors behind their disparities, and the connections between these two distributions. The first part suggests a systemic change occurred, leading from the application of the "need principle" to the assertion of the "market principle". In the second part, the changing importance of individual factors of earnings in favour of education and occupation is demonstrated. In the third part, the intermediating factors between earnings and household are presented and income packaging is analyzed. More income is collected from the labour market and more of it is redistributed by the state. A systemic change occurred on one principal axis – the much greater role of education in the entire process.

Keywords: earnings structure, household income, income inequality, Czech Republic.

JEL Classification: I31, J31, P36.

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1. Introduction

There seems to be a gulf between the analysis of earnings and the analysis of household incomes. While the former fall within the sphere of labour economics, the latter belong more to the sphere of social policy. But rare are the analyses that describe both and discuss the connections between the two. In the seminal work by Atkinson and Micklewright (1992), both types of distribution are presented, with intention to analyze also the relationships between them. In the *Handbook of Income Distribution* (Atkinson and Bourguignon, 2000), the two fields are approached somewhat separately, with the exception, again, of Atkinson and Micklewright's chapter on income distribution in transition. The only study found in recent literature that treats the two fields in interrelation is an analysis by Gottschalk and Danziger (2005) of inequality in earnings and household income in the United States.

Unlike this division in the field of economics, in the real world, the choices, decisions and strategies relating to these two spheres occur within a single unit – the household. A household's living standard depends on other events and factors, from the individual educational paths of the individuals and selective mating, to how a husband and wife shape and balance their careers, the decisions they make about the timing and number of children they have, and how they share the responsibility for caring for them. In analytical terms, the process starts with individual earnings and continues with the accumulation of individual earnings in the household. Other "market incomes" are added from business and property. Then there are the various social benefits that are received and income tax and contributions that are levied. For analytical and comparative purposes the total disposable income should be adjusted to household size and composition in some way.

There is still no comprehensive picture of how household earnings are determined and household income is packaged for the Czech Republic, nor for that matter is there for many other countries The first part of this picture relates to the Czech labour market; it has already been well described elsewhere in literature (Chase, 1998; Filer, Jurajda and Plánovsky, 1999; Flanagan, 1995; Jurajda, 2000; Münich, Svejnar and Terrell, 1999), and I also have written several papers that trace post-1989 developments in earnings (Večerník 1991, 1995, 2001a).

But the second part of the picture, which relates to couples and households, is rarely depicted, and here I must refer to my own previous work (Večerník 1996, 2001b). Between these two parts lies also redistribution by transfers and taxes, which, despite its enormous importance, has also only been insufficiently dealt with to date (Schneider and Jelínek, 2001 and 2005, Večerník, 2002 and 2006). The objective of this paper is to sketch this picture more fully.

Fortunately, there are surveys available in which data on personal earnings and household income have been collected simultaneously and from which it is possible to observe the connections between these two areas. In the paper below I begin the analysis by raising several hypotheses about qualitative changes in the system and by introducing the data sources. I then present the changes in the distribution and structure of earnings, illustrating their adjustment to market conditions, and proceed to point out the intermediary factors between earnings and the resulting household income. The paper closes with a description of the sources of income packaging in households, their inequality and the factors relevant to how household income is collected and distributed.

2. System changes after 1989

Through ownership restructuring and the liberalization of labour contracts the economic reforms introduced since 1989 have caused pronounced shifts in earnings distribution and in the shape of the income structure in the Czech Republic. Newly established and foreign firms were granted more liberty over wage settings and have consistently sought to attract highly skilled people by offering higher wages. Labour mobility increased as people found better-paid jobs. With the removal of wage regulation, former state-owned companies also began to have greater discretion in rewarding their employees and differentiating wages.

A number of evident changes that can be described in quantitative terms occurred: an increase in earnings inequality in general, higher returns to education, new wage differences by industry, a changing age profile relating to earnings, and a gender wage gap. However, changes have also been qualitative and systemic, and this raises the question of how best to approach these changes. There is scant theory in this area. The "socialist" reward system was presented in ideological rather than properly theoretical terms, while conversely the "capitalist" system is most often explained solely in terms of human capital theory, which fails to cover the other dimensions of inequality.

However, there is a big gap between the way the "socialist" (command) economy presented itself and reality. While it pretended to follow Marx's dictum about the targets of reward in a socialist society – "each according to his abilities, to each according to his work" -– in reality it applied a principle derived instead from Marx's labour theory of value: the capitalist exploits the worker, receiving from him the whole product, but paying him only for his reproduction (Marx, [1867] 1965). Reward is governed by the principle of meeting basic needs: workers must be nourished and their families must reproduce themselves. This implies that demographic characteristics (sex and the life cycle) have the most weight in determining wages, which reflect the costs of the reproduction of the labour force.

Although "equalization" was verbally challenged by the regime as harmful to work incentive and especially as incompatible with the Marxist theory of "socialist society", it was the predominant guiding principle and was resistant to all attempts to "de-equalize" wages during attempts of economic reforms. However, two sorts of preferences were applied. In accordance with the "need principle", workers in mining, metallurgy and heavy machinery

should be better paid, as they needed to "eat more". Alongside the implicit need principle, the explicit principle of a labour's "public utility" for the regime was applied, which endorsed higher rewards and other privileges for top party and state bureaucracy officials, army officers, police staff, and even for top athletes and artists.

In the alternative approach, society is organized according to the "market principle". Following to Adam Smith's explanation, human behaviour is internally regulated by profit seeking. The market differences that appear reflect individual contributions to labour productivity and production efficiency. Therefore, instead of demographic and reproductive features, market characteristics move to the fore. The administration of wages according to reproduction needs is replaced by distribution based on contributions to national income, which are themselves products of education, job commitment, and managerial responsibility.

Scheme 1 Distribution of earnings under the command and market economy (stylized)

Characteristic	***Command economy***	***Market economy***
Generator of inequality	the state, only marginally also the labour market	the labour market, the state setting the framework
Distribution according to	basic people's needs but also loyalty to the regime	skills and performance, but also network appurtenance
Main factors of disparities	gender, age, preferred industries	human capital, entrepreneurship
The role of education	state investment generating small disparities	individual investment generating large disparities
The role of age	historical generations and loyalty (linear increase)	career, accumulated experience (curvilinear)
Best rewarded branches	mining, metallurgy, heavy industry	finance, top technologies, professional services
Managerial premiums given for	political position, risk aversion	innovation, risk taking

Scheme 1 presents an attempt to sketch the stylized outline of the changes in earnings distribution. All the facts are stylised and represent only an approximation of a much more complex and obscured reality. The differences between regimes suggest that the whole macroeconomic context of disparities in earnings is changing – from the general economic goal and the main generator of inequality to the role of gender, age, education, and managerial position in generating disparities. Each system has a different emphasis: either managers or rank-and-file workers, either the working class or the middle classes, and either manual or mental work.

There are several obstacles in the way of turning this outline into an analysis of real data. First, in reality no system appears purely as one kind of system. The equalized socialist society also combines the privileges of a totalitarian ruling class and is distorted by informal economy, while market capitalism involves monopolies, networks and state interference in the economy. Second, the lack of indicators means that not all distinctions can be operationalized; for instance, there is no indicator of work performance. And third, there are substantial limits to the information source, regarding the possibility of measurement of all the necessary characteristics and, moreover, availability of all the necessary variables in one dataset.

Bearing in mind these limitations, let us focus on just several facts:

1. According to the "need principle", disparities in earnings are to be small, as people do not differ too much with regard to their basic needs. According to the "market principle", differences are produced by the market and as such are in theory unlimited.
2. According to the "need principle", it is not the individual but the household that is the unit of reproduction. Therefore, gender and age (reflecting the family situation and life cycle) are the criteria that directly determine the reward; women's earnings are moreover but a supplementary contribution to the household budget. Following the "market principle", gender disparities are not predetermined in any way.
3. According to the "need principle", occupation and industry matter in terms of the amount of physical energy a worker must invest. According to the "market principle", occupation and industry matter in terms of productivity, competitiveness and market success.
4. According to the "need principle", the effect of education is minor or even negative (people who perform non-manual occupations, usually better educated, do not need to eat as much).[1] However, according to the "market principle", education is the main component in human capital and directly affects labour productivity and, therefore, also the final product.

Even these simple hypotheses come up against serious data limitations. In each of these cases, the qualitative difference is approximated by quantitative shifts. It must be always kept in mind that there is no way of actually describing human needs or a worker's performance. Surveys fail to cover a large part of social reality and the available data are not entirely comparative. Therefore, the exercise at hand should be viewed as just an attempt.

3. The changing range and structure of earnings

Using the Microcensus surveys on household incomes of 1988, 1996 and 2002 (see Annex for description of the data) I will now attempt to present the changes that have occurred since 1989 in the Czech Republic in relation to the hypotheses formulated above about various quantitative manifestations of underlying qualitative changes. As noted, this picture can only be depicted with far fewer dimensions than necessary owing to the limited amount of workers' characteristics provided in wage statistics and income surveys.

3.1. Overall changes

Communist Czechoslovakia was one of the most equalized countries in the world. The three decades following 1959 – when regular wage surveys started – constituted a period of unique stability in overall earnings distribution. In other European communist countries, there was periodic pressure both to increase differentials (e.g. during reform periods in Hungary and Poland) or to diminish the range in earnings (e.g. through periodic increases of the minimum wage in the USSR and Bulgaria). Nothing in this vein occurred in Czechoslovakia. Only the efforts of the 1968-69 economic reform – aiming de-equalize wages to strengthen their incentive effect – succeeded in increasing earnings differentials to the benefit of about five percent of highly rewarded workers (Večerník, 1996).

[1] Marx also stressed differences based on "work complexity", which, however, could far to counterbalance the primary effect of the costs of the reproduction of the labour force.

Wage settings changed considerably after 1989. In the public sector, a new and simpler tariff grid was applied, which (similarly as the former one) favours experience over qualification. In most of the private sector, wages are negotiated between employers and trade unions. Since 1989 the rise in wage levels has been held back by some adverse measures. A minimum wage, previously non-existent, was introduced in 1991, but its level remained frozen until 2000. Wage growth was initially controlled until 1992, when wages were partially liberalized. After a period of no controls at the beginning of 1993, tax-based wage regulation was re-introduced, but it was later eliminated completely in 1995 (Flek, 1996).

Table 1 Distribution of earnings among employees by deciles (percentages and coefficients)

Decile	Wage surveys					Microcensus surveys			
	1989	1993	1997	1999	2002	1988	1992	1996	2002
1	4.7	4.4	4.6	4.4	4.3	5.3	5.0	3.9	4.4
2	6.5	5.6	5.9	5.8	5.6	6.6	6.1	5.5	5.6
3	7.3	6.6	6.9	6.7	6.6	7.4	6.9	6.6	6.5
4	8.2	7.4	7.7	7.5	7.4	8.3	7.7	7.5	7.3
5	9.1	8.4	8.5	8.3	8.2	9.2	8.5	8.4	8.1
6	10.1	9.4	9.3	9.1	9.0	10.0	9.4	9.4	9.1
7	11.0	10.7	10.2	10.1	10.0	10.9	10.4	10.4	10.1
8	12.2	12.2	11.0	11.4	11.4	12.0	11.7	11.8	11.5
9	13.7	14.6	13.1	13.8	13.7	13.3	13.8	14.1	13.8
10	17.2	20.7	22.8	22.9	23.8	17.0	20.5	22.4	23.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Decile ratio	*2.45*	*2.74*	*2.82*	*2.92*	*2.99*	*2.37*	*3.11*	*3.23*	*3.01*
Ratio 10:1	*3.66*	*4.70*	*4.96*	*5.20*	*5.53*	*3.21*	*4.10*	*5.74*	*5.32*
Robin Hood Index	*14.1*	*18.2*	*17.1*	*18.2*	*18.9*	*13.2*	*16.4*	*18.7*	*18.8*
Coefficient Gini	-	-	-	-	-	*0.20*	*0.26*	*0.27*	*0.27*

Source: Wage surveys; Microcensus surveys.

Notes:

Percentages in cells are shares of individual deciles in the total amount of income. Decile ratio is the ratio of the lower bound value of the tenth decile to the upper bound value of the first decile of wage distribution. Ratio 10:1 is the ratio of the averages of the upper and lowest deciles. *The Robin Hood Index* is the "maximum equalization percentage", which involves taking those decile groups that exceed 10 percent and adding the amount by which their shares exceed those levels. Algebraically, it is half the mean deviation divided by the mean. Because it basically measures the percentage that would be have to be redistributed in order to obtain an equal distribution; it was called the "Robin Hood" Index by the Polish/British economist Joanna Gomulka (Atkinson and Micklewright, 1992, p. 117).

After 1989, earnings inequality, to that time stagnant, began to develop (Table 1). According to wage surveys, the decile ratio rose in 1989-2002 from 2.45 to 2.99. According to Microcensus data, the ratio even increased in 1988-1996 from 2.37 to 3.23. However, it must be recalled that this indicator (the ratio of the lower bound value of the tenth decile to the upper bound value of the first decile of wage distribution) does not take into account the earnings of the lowest and the highest ten percent of recipients. When the averages of the upper and lower ten percents are added in, then the ratio (labelled as *10:1* in the Table 1) is even higher and the change over time looks more impressive. The two sources correspond in estimating 1:5.5 as the ratio of high to low average income decile in the early 2000s, which is 1.5-1.7 times higher than it was in 1989.

There is some ambiguity to the statistical evidence on earnings inequality after 1989. According to wage statistics, the lowest earnings category and those just above only slightly

diminished in proportions or remained stable. Disparities widened as the share of the top ten percent of employees grew. The picture provided by the Microcensus surveys is similar, but even more salient at both ends of wage distribution: the top category of income distribution considerably increased its share, while the bottom income category moved slowly downwards until 1996 and has again risen upwards since. In any case, the differences in the middle of earnings distribution were relatively narrowed, and the bulk of income disparities remained compressed.

3.2. Gender, age and education

The application of the "need principle" under the communist regime resulted in far greater weight being accorded to the demographic characteristics of workers than to economic features in determining earnings. Among communist countries, gender was by far the most important explanatory variable in the wage disparities in former Czechoslovakia. Age was also important because of the cumulative effect of its generational and career significance. The "founders of the communist regime" (the youth of 1948) were treated preferentially for the whole of their lives, and this was combined also with the fact that seniority served as a qualification for top management (Večerník, 1991).

Table 2 Regression analysis of *ln* gross earnings among employees by sex, age and education

Variable	Regression 1				Regression 2			
	1970	*1988*	1996	2002	*1970*	*1988*	1996	2002
Sex	-0.475	-0.379	-0.368	-0.321	-0.444	-0.364	-0.378	-0.342
Age:								
25-29	0.190	0.217	0.179	0.145	0.165	0.184	0.109	0.107
30-34	0.265	0.371	0.230	0.125	0.241	0.331	0.157	0.110
35-39	0.306	0.421	0.259	0.156	0.291	0.391	0.200	0.123
40-44	0.330	0.462	0.262	0.167	0.320	0.431	0.225	0.163
45-49	0.345	0.465	0.267	0.112	0.345	0.435	0.229	0.138
50-54	0.327	0.463	0.270	0.122	0.331	0.444	0.222	0.149
55-59	0.270	0.394	0.202	0.100	0.281	0.373	0.153	0.103
60-64	0.234	0.203	-0.146	0.063	0.242	0.186	-0.274	-0.019
Education:								
vocational	-	-	-	-	0.092	0.057	0.159	0.141
secondary	-	-	-	-	0.179	0.140	0.424	0.423
university	-	-	-	-	0.362	0.329	0.743	0.710
Intercept	*7.987*	*8.064*	*9.453*	*9.861*	*7.857*	*7.974*	*9.227*	*9.579*
Adjusted R^2	*0.393*	*0.368*	*0.180*	*0.129*	*0.440*	*0.448*	*0.371*	*0.326*

Source: Microcensus surveys.
Omitted categories: age up to 24, elementary education.
All coefficients are significant on the level < 0.001.

Regression analyses demonstrate the extensive changes that have occurred in the earnings structure (Table 2). While in 1988, gender alone explained 31 percent of the variance of earnings; by 2002 it accounted for a mere 10 percent of the variance.[2] However, the gender

[2] The regression that includes the single sex variable and the single education variables are not included in Table 2.

gap decreased much less than the significance of the gender gap did in the context of overall earnings structure. Also, the significance of the age variable (5-year categories) fell to half, and the total significance of demographic characteristics (sex and age together) decreased from 37 to 13 percent. In contrast, the explanatory power of education alone (four degrees) increased from 11 to 19 percent, which suggests that in a relatively short time span, education became the most important factor in earnings variations.

According to the theory of human capital, education and experience determine the productivity of labour and, consequently, also worker's earnings (Becker, 1964). From this point of view, communist Czechoslovakia was among the countries where the importance of education was downgraded most. This was true not only in comparison with the advanced Western countries, but also compared with other Central-East European countries. After a period so unfriendly to the valuation of human capital and investment into it, a reverse effect could be expected to ensue leading to a rapid increase in the rewards to those with higher levels of education (despite the questionable) nature of some of the skills and diplomas acquired in the communist era).

The changing returns to education and experience can be measured with a standard procedure using Mincerian equations (Mincer, 1974), formulated as:

$$ln(y) = b_0 + b_1 s + b_2 e + b_3 e^2,$$

where $ln(y)$= the natural logarithm of earnings, s= years of schooling and e= years of experience. As usual, the schooling variable is calculated from the years needed on average to get the degree reported in the survey, while experience is calculated as age minus schooling minus six. Another equation is used to distinguish between the returns of various education levels, formulated as:

$$ln(y) = b_0 + b_1 sv + b_2 ss + b_3 su + b_4 e + b_5 e^2,$$

where sv= the dummy for vocational training, *ss* =the dummy for high school, and =the dummy for university education, with elementary education as an omitted category.

It must be noted that over the real lifetimes of the individuals surveyed in the sample the education system underwent repeated restructuring. In order to homogenize the various systems of schooling for this analysis elementary education (the reference group) was averaged as corresponding to eight years of compulsory schooling from the age of six, followed either by vocational school (three years) or secondary school (four years) and university (another four to five years). The data do not distinguish post-graduate qualifications, which are still quite rare in the country. All earnings functions are estimated by ordinary least squares (OLS).

By the end of the communist era, each additional year of schooling increased men's earnings by 4.1 percent and women's earnings by 5.0 percent. Under the market regime those figures more or less doubled. The effect of experience (or, rather, the joint effect of a person's age and his/her generation) on earnings increased up to the mid-1990s but later declined again. Whereas in 1988, the effect of experience was as strong as that of education for men, the gap between the effects of the two variables continued to widen tremendously until 2002. In the 1996-2002 period, the effect of education stagnated while the effect of experience declined, even to the negative (Table 3).

Table 3 Returns to education among employees: Mincerian equations, dependent variable *ln* gross earnings

Category and variable	Regression 1				Regression 2			
	1970	1988	1996	2002	1970	1988	1996	2002
Both sexes								
Years of school	0.048	0.044	0.088	0.086	-	-	-	-
Experience	0.035	0.028	0.032	0.014	0.035	0.028	0.032	0.015
Experience^2/100	-0.059	-0.056	-0.066	-0.028	-0.059	-0.058	-0.066	-0.029
Sex	-0.440	-0.350	-0.360	-0.325	-0.438	-0.356	-0.377	-0.341
Education:								
vocational	-	-	-	-	0.108	0.049	0.142	0.134
secondary	-	-	-	-	0.222	0.145	0.412	0.417
university	-	-	-	-	0.459	0.387	0.739	0.722
Intercept	*7.289*	*7.665*	*8.362*	*8.855*	*7.652*	*8.051*	*9.093*	*9.544*
Adjusted R^2	*0.447*	*0.444*	*0.367*	*0.311*	*0.451*	*0.446*	*0.375*	*0.325*
Men								
Years of school	0.041	0.041	0.083	0.081	-	-	-	-
Experience	0.047	0.032	0.038	0.019	0.047	0.032	0.038	0.020
Experience^2/100	-0.081	-0.068	-0.078	-0.039	-0.081	-0.070	-0.078	-0.039
Education:								
vocational	-	-	-	-	0.070	0.040	0.168	0.132
secondary	-	-	-	-	0.179	0.123	0.394	0.370
university	-	-	-	-	0.392	0.353	0.729	0.696
Intercept	*6.796*	*7.326*	*8.017*	*8.534*	*7.131*	*7.688*	*8.662*	*9.181*
Adjusted R^2	*0.240*	*0.260*	*0.275*	*0.216*	*0.245*	*0.262*	*0.278*	*0.223*
Women								
Years of school	0.053	0.050	0.095	0.091	-	-	-	-
Experience	0.024	0.020	0.026	0.009	0.025	0.021	0.026	0.010
Experience^2/100	-0.036	-0.034	-0.052	-0.017	-0.038	-0.036	-0.054	-0.018
Education:								
vocational	-	-	-	-	0.136	0.049	0.111	0.122
secondary	-	-	-	-	0.236	0.176	0.428	0.451
university	-	-	-	-	0.532	0.452	0.763	0.741
Intercept	*6.467*	*6.946*	*7.614*	*8.192*	*6.867*	*7.369*	*8.391*	*8.886*
Adjusted R^2	*0.131*	*0.242*	*0.270*	*0.221*	*0.138*	*0.249*	*0.288*	*0.249*

Source: Microcensus surveys.
All coefficients are significant on the level < 0.001

These results are basically consistent with observations made elsewhere. According to Filer, Jurajda and Plánovsky (1999), who used a database of firms, returns to education for men in the Czech Republic amounted to 8.1 percent of return to education for one year of schooling in 1995 and 9.0 in 1997. However, according to Münich, Svejnar and Terrell (1999), who used a special survey of households conducted among 4,700 individuals in the labour force, the returns to education in 1996 amounted to only 5.8 percent of return to education for one year of schooling by men and 7.0 by women, which is close to the Microcensus figures for 1992 (not presented in this paper). The underestimation of disparities according to education are otherwise also quite common in sociological surveys, where people tend to respond by estimating net rather than gross earnings, even if they are asked for the latter.

3.3. Industries and occupations

According to the "need principle", occupation and industry matter in terms of the physical energy the worker must invest. Production branches were much better rewarded than services were (the "non-productive" sector in Marxist vocabulary). First and foremost were the mining and heavy industries, which were also politically important owing to their fundamental significance for the military. Agriculture was heavily subsidized under the command economy for two reasons. First, failures resulting from the collectivisation of private farming could not be admitted, and as the state decidedly favoured cooperatives it had to compensate for all their losses. Second, achieving self-sustenance in the production of agriculture products was a major political objective.

According to the "market principle", occupation and industry matter in terms of their productivity. In this regard the situation started to change rapidly after 1989, but not consistently. As wage statistics show, services expanded, but these were first and foremost financial services. The banking and insurance sectors advanced considerably by utilizing all possible means to avoid wage regulation. Trade and catering also improved somewhat. In contrast, public services were left behind. Health and social services slightly improved their earnings position, but education and research stagnated, though they experienced some fluctuations, improving their position in the mid-1990s but then sliding backwards again to reach a low in 1998.

In the larger context of determining earnings, the relative importance of the two variables – occupation and industry – can be compared for 1970, 1996 and 2002, but with some limitations. In 1970, the classification of industries differs in one item: the banking and insurance branch was not observed separately (since it was only a small section of state administration) so heavy industry (mining, metallurgy and heavy machinery) was used in its stead, which was similarly privileged by the regime at that time as banking is privileged now, however only implicitly. Managers and professionals cannot be distinguished either in this historical dataset. The coding of occupations in the 1996 and 2002 surveys differs slightly, which underestimates the importance of this variable.[3]

[3] The fact that managers in 2002 have lower relative earnings than in 1996, while unskilled workers perform better, may also be caused by the much smaller sample in 2002, which failed to cover the two extreme categories to the same extent as in 1996.

Table 4 Regression analysis of* ln *gross earnings among employees by industry

Industry	Regression 1			Regression 2			Regression 3		
	1970	1996	2002	1970	1996	2002	1970	1996	2002
Manufacturing	0.044	0.121	0.073	0.020*	0.068	0.009*	0.018*	0.063	0.014*
Construction	0.210	0.195	0.145	0.170	0.124	0.071	0.061	0.040	-0.006*
Transport and communications	0.181	0.167	0.194	0.174	0.129	0.141	0.100	0.075	0.096
Health and welfare	0.048*	0.105	-0.057	-0.126	-0.121	-0.299	-0.091	-0.087	-0.248
Education	-0.006*	0.066	0.065	-0.194	-0.101	-0.127	-0.018*	-0.002*	-.016*
Administration and defence	-0.212	0.297	0.185	0.105	0.153	0.012*	0.021*	0.096	-0.034
Banking and insurance**	0.236	0.632	0.813	0.205	0.471	0.621	0.124	0.433	0.618
Intercept	*7.465*	*8.987*	*9.411*	*7.751*	*9.309*	*9.809*	*7.895*	*9.267*	*9.840*
Adjusted R^2	*0.044*	*0.049*	*0.089*	*0.164*	*0.297*	*0.322*	*0.461*	*0.454*	*0.460*

Source: Microcensus surveys.
All coefficients except these marked by * are significant on the level < 0.001.
Regression 1 Only variable "industry" entered.
Regression 2 Controlled for occupation.
Regression 3 Controlled for occupation, sex, age and education.
Omitted categories: trade and catering, other occupation, 20-24, elementary education
** In 1970, heavy industry is considered instead of banking and insurance.

In Table 4, the weight of disparities by industry – alone and additively to other variables – is presented, following the previous analysis in Tables 2 and 3. The industry variable alone (containing eight branches, with the category of trade and catering omitted) explains about five percent of the earnings variance in 1970 and 1996, but as much as eight percent in 2002. Wage shifts according to industry resulted in a slight increase in the significance of this dimension, mostly however owing to the huge and steadily increasing income supremacy of the banking and insurance sector.

Table 5 Regression analysis of *ln* gross earnings among employees by occupational category

Occupational category	Regression 1			Regression 2			Regression 3		
	1970	1996	2002	1970	1996	2002	1970	1996	2002
Managers	}	0.383	0.221	}	0.458	0.237	}	0.459	0.181
Professionals	0.253	0.055*	-0.051*	0.376	0.205	0.084*	0.160	0.200	0.006*
Technicians	-0.106	-0.211	-0.174	-0.108	-0.082*	-0.129	-0.019	0.050*	-0.059*
Administrative	-0.064*	-0.375	-0.267	-0.086*	-0.327	-0.328	-0.059	-0.028*	-0.102
Sale	-0.368	-0.609	-0.603	-0.393	-0.473	-0.564	-0.139	-0.115	-0.311
Skilled	-0.131	-0.354	-0.390	-0.201	-0.283	-0.393	-0.151	-0.055*	-0.252
Unskilled	-0.339	-0.796	-0.784	-0.403	-0.686	-0.739	-0.096	-0.307	-0.473
Intercept	*7.758*	*9.457*	*9.835*	*7.751*	*9.309*	*9.809*	*7.811*	*9.267*	*9.840*
Adjusted R^2	*0.112*	*0.261*	*0.235*	*0.164*	*0.297*	*0.322*	*0.460*	*0.454*	*0.460*

Source: Microcensus surveys.
All coefficients except these marked by * are significant on the level < 0.001.
Regression 1 Only variable "occupation" entered; Regression 2 Controlled for industry; Regression 3 Controlled for industry, sex, age and education; Omitted categories: trade and catering, other occupation, 20-24, elementary education; } In 1970, categories of managers and professionals are in one category.

As Table 5 shows, occupational categories – though only very broadly conceived – are much more substantial for earnings than branches. After 1989, the importance of this dimension mounted owing to the appreciation of managerial and intellectual work under the market economy. On the other hand, the political privileges of manual work were eliminated and the rewards in this branch fell. Looking at average earnings (not presented in tables), we see that the gap between the earnings of unskilled workers and managers, which was 1:1.8 in 1970, widened to 1:3.4 in 1996, but in 2002 decreased to 1:3.0. This is also related to the switch from the industry to occupation variable observed in the two post-1989 surveys: while industry mattered less and occupation more in 1996, the opposite appeared in 2002.

After controlling for other variables, it is possible to observe the "net" disparities. The most striking feature of the branch structure of earnings – the exceptional position of banking – is only moderately attenuated when occupation and human capital variables are controlled for. On the other hand, the heavy underestimation of health services is accentuated when the professional character superior educational foundation of this branch is taken into account. The overall variance explained remains remarkably stable across time, reaching 46 percent in all years under observation. However, the determination of earnings has changed substantially: instead of sex and age, the variables of education, branch and position matter in the occupational hierarchy. Earnings now seem to be determined more by subtle features that resist routine statistical investigation: special skills such as languages and computer skills, and personal skills such as flexibility and managerial talent.

4. From personal earnings to household income

While there are only few – if any important – problems in defining earnings, it is not easy to capture all the diversity that we face in connection with the "appropriate" definition of household income or, better put, a household's monetary standard of living. Families collect income from various sources and there are also several structures that mediate between personal earnings and the resulting household income level. Is the female spouse economically active and how much does she earn? Are there children in the household, if so, how many, and how old are they? How much does the state take from and give back to the household? And finally, what income indicator best expresses a household's standard of living?

Of course, intermediary structures are more or less interlinked and related to the life cycle of the family. While the age of a person matters now much less than before in the structure of earnings, it certainly retains its effect on household income, due to various circumstances. Even if we focus only on employee households headed by person in prime age (25-54) there is still considerable diversity. Moreover, household income has to be adjusted by household size and composition - a task that is never solved satisfactorily with one simple indicator. Here we must tackle a complex issue that has various constituent parts: household size and composition, the economic activity of women, the earnings of couples, additional income sources, tax burden and transfer income.

Scheme 2 Distribution of family income under the command and market economy (stylized)

Characteristic	*Command economy*	*Market economy*
Pillars of income distribution	mandatory employment even of women, universal benefits, predetermined life cycle	no mandatory employment, targeted benefits, rather undetermined life cycle
Main factors of inequality	number of active earners and dependent children	disparities in individual earnings
Family expenditures	mostly on food and other individualised items, low shared costs (housing)	high shared costs (housing, durable goods, financial payments)
Economies of scale	rather low	rather high
Dominant income indicator	per capita income (or steep equivalence scale)	household disposable income (or flat equivalence scale)
Correlation of disposable household income with per capita income	rather weak	rather strong
Correlation of adjusted income with household head's earnings	rather weak	rather strong

In parallel with Scheme 1, Scheme 2 provides a snapshot glimpse of the changed context and factors of household income distribution. The differences imply the diminishing effect of the life cycle and a household's "demography" in favour of market-dependent income disparities. Important changes also occurred in household budgets and the related "appropriate" indication of a household's standard of living. Instead of budgets overburdened with basic – not shared – expenditures, implying a steep equivalence scale, we have budgets with much higher expenditures on shared items, implying therefore a much flatter equivalence scale, as in Western countries.

4.1. Overall changes

After 1989, important changes occurred in household size and composition. According to Microcensus surveys, the average number of persons in employee households went down somewhat between 1988 and 2002 (from 3.3 to 3.0), owing to the smaller number of children (from 1.25 to 0.95). While the share of economically active members remained the same, the number and share of "other members" has increased, as many spouses of household heads left the labour market. Although there are far fewer employee households under the new economic regime, and therefore they could be expected to be more homogenous in size and composition, in fact they have become more varied, especially with regard to the number of children.

Surprisingly, the composition of income sources in a household has changed much less (Table 6, first section). While the share of the household head's earnings has increased somewhat, the share of the spouse's earnings has remained almost stable. The most striking change was therefore the reduction of family social benefits. The "other" income sources (from business and property) remain negligible parts of employee household income.

Important changes have affected the financial burden of households. While personal income tax has been reduced, the joint burden of households increased by about five percentage points as a result social and health insurance contributions. Since transfer income has decreased by the same relative amount, the effective tax rate rose by nine percentage points to reach 15 percent of gross household income.[4]

Table 6 Shares and inequality of income sources in employee households

Income source	1. Income source in percent gross income			2. Inequality of the income source (Gini)			3. Share of income source in total inequality		
	1988	1996	2002	1988	1996	2002	1988	1996	2002
Total earned	*86.2*	*89.2*	*89.4*	*0.256*	*0.300*	*0.312*	*1.008*	*1.261*	*1.287*
▪ earnings head	55.9	56.3	59.5	0.170	0.258	0.268	0.366	0.499	0.560
▪ earnings spouse	22.7	22.7	21.6	0.476	0.581	0.636	0.443	0.461	0.482
▪ earnings others	7.6	10.3	8.3	0.897	0.847	0.881	0.199	0.301	0.245
Total transfer	*12.0*	*8.3*	*8.7*	*0.465*	*0.606*	*0.638*	*0.170*	*0.002*	*0.016*
▪ social benefits	9.4	5.0	4.9	0.466	0.619	0.662	0.132	-0.016	-0.011
▪ pension benefits	2.6	3.3	3.8	0.904	0.876	0.871	0.038	0.018	0.027
Other income	*1.7*	*2.4*	*1.9*	*0.880*	*0.930*	*0.909*	*0.034*	*0.069*	*0.037*
Total gross income	***100.0***	***100.0***	***100.0***	***0.199***	***0.266***	***0.274***	***1.212***	***1.332***	***1.341***
Tax and insurance	15.4	20.0	20.2	0.270	0.356	0.374	-0.212	-0.332	-0.341
▪ income tax	15.4	9.2	9.4	0.270	0.439	0.463	-0.212	-0.186	-0.191
▪ insurance	-	10.8	10.8	-	0.295	0.310	-	-0.146	-0.150
Total net income	***84.6***	***79.9***	***79.8***	***0.194***	***0.249***	***0.255***	***1.000***	***1.000***	***1.000***
Total tax/transfer	-6.0	-15.1	-15.2	-1.105	-0.595	-0.622	-0.042	-0.330	-0.325

Source: Microcensus surveys.
For the decomposition of the Gini coefficient by income source, Stata module Descogini (programmed by A. Lopez-Feldman) was used. The analysis was kindly made by Michal Franta, a graduate student at CERGE/EI in Prague.

Inequality in primary income sources rose considerably after 1989 and continued to rise slightly also after 1996 (Table 6, second section). The most striking increase in inequality was witnessed in the earnings of the household head and his/her spouse. Also family social benefits have also become more unequally distributed since the mid-1990s, following the targeting introduced by social reforms. There was a considerable increase in inequality in personal income tax. All combined, the resulting household income differentiation has risen by about one-third since 1988. And, while inequality in gross and net income was almost the same in 1988 (due to the universal social benefits and flat personal income tax), by 2002 gross household income inequality clearly surpassed disposable income inequality.

Decomposition analysis is used to examine how individual income sources contribute to resulting income inequality. This method, which was introduced by Lerman and Yitzhaki (1985) and Stark et al. (1986), makes it possible to determine the impact of a particular income source on total net income inequality as represented by the Gini coefficient. More advanced method allows to distinguish effect of changing structure (characteristics effect) and

[4] Under the command economy, redistribution was completely opaque and only wage tax was paid by employees, becoming almost flat during that time (Večerník, 1986). This fact allowed me to adjust earnings variables to make them comparable – the gross wage instead of the net wage that is available from the Microcensus 1989 survey. The new system started to work in 1993 when personal income tax and social and health insurance contributions were introduced, the latter contribution divided between employees and employers.

their relationships (coefficient effect). Here, we can only assume that the change was mostly done by coefficient effect as Ira N. Gang and Myeong-Su Yun (2002) found for changes in male wage inequality in East Germany, applying and developing the Blinder-Oaxaca method.

The importance of the disparities between the earnings of a husband and wife for inequality of household income has strengthened considerably since 1990 (Table 6, third section). While under the command regime, a wife's earnings were the more important of the two (owing to the differences stemming from her employment), in the market economy the male head's earnings became more important (due to larger wage disparities). Transfer income contributed considerably to inequality under the command regime but it has almost no effect now, despite the better targeting of family social benefits. In contrast, the financial burden matters much more now than before 1990: its share in resulting income inequality increased from one-fifth to one-third. The picture in 1996 and 2002 is quite different from what it was in 1988, as more inequalities are produced by the labour market and the state intervenes more to equalize them.

4.2. Economic activity of women and earnings of couples

Income situation of a household is considerably affected by the number and age of children. Important changes occurred in the area. Due to various circumstances, developments after 1989 led to a considerable decline in fertility rates. The average number of dependent children in employee families with a head in the prime age group decreased by about one-quarter between 1988 and 2002, while the percentage of childless households increased from 15 to 25 percent. Additional information on women's economic and reproductive behaviour is presented by age category in Table 7. It must be noted that the data refer to dependent children still living in the households surveyed.

Table 7 Economic activity and children in employee households (%)

Age category of spouse	Economic activity of spouse			Have at least one dependent child			If have a child, average number of children		
	1988	1996	2002	1988	1996	2002	1988	1996	2002
19-24	57.6	38.1	43.8	82.6	79.4	47.2	1.47	1.31	1.20
25-29	70.5	54.5	53.7	93.2	91.7	71.1	1.80	1.66	1.56
30-34	85.2	73.7	52.1	96.8	95.9	94.2	2.07	1.94	1.85
35-39	93.2	86.7	66.7	96.1	95.2	94.4	2.05	2.00	2.00
40-44	94.9	90.4	85.7	84.3	86.8	92.0	1.68	1.76	1.89
45-49	94.5	88.3	85.6	50.4	57.3	48.5	1.36	1.50	1.47
50-54	91.7	79.7	85.9	22.9	31.0	33.3	1.18	1.28	1.32

Source: Microcensus surveys.

Economic activity has decreased considerably for women up to 34 years of age. Unexpectedly, the same is true of their "family burden" (the number of dependent children and their needs relative to their ages), especially with regard to the category up to 24 years of age, and even the category aged 25-29. Children arrive later in the life cycle; about a five-year

deferral in childbearing was recorded between 1989 and 2002.[5] The data on the presence and number of children in families of middle-aged women show both a shift in the timing of births and longer schooling (or other dependency status) of teenage students.

Yet another change occurred during this period. While in 1988 the number of children a woman had was negatively associated with her level of education, no such correlation was found in the two following observations. On the other hand, the economic activity of women is now significantly correlated with education (when a woman's age or life-cycle period is controlled for), unlike the situation under the command economy, with mandatory full-employment and where no such differences could occur. Obviously education matters in this as the main factor in unequal opportunities in the labour market.

The earnings of couples can be surveyed from a sub-sample of households with two employees. The gap between the contributions made by husbands and wives to their joint household budgets decreased by 15 percentage points between 1988 and 2002 (measured as the percentage of the wife's wage to her husband's wage; in 2002 it was almost 80 percent). Part of this trend is caused by the increased social homogeneity of employee households in the market regime. However, the association between the two earnings strengthened after 1989: Pearson coefficient of correlation (0.17 in 1988) increased from 0.29 in 1996 to 0.37 in 2002. While in 1988 a wife earned more than her husband in only 7 percent of couples by 1996 the figure was already 16 percent and by 2002 it was 17 percent. The lower a man's education level, the greater the probability his wife had higher earnings.

Table 8 Returns to education in employee couples: Mincerian equations, dependent variable *ln* gross earnings

Variable	Earnings of husband			Earnings of spouse		
	1988	1996	2002	1988	1996	2002
Years of school of husband	0.033	0.081	0.068	0.001*	0.030	0.025
Years of school of spouse	-0.001*	0.008*	0.025	0.044	0.084	0.091
Experience of husband	-0.017*	0.001*	-0.010*	0.035	0.004*	-0.003*
Experience of spouse	-0.001*	0.000*	0.008*	0.064	0.009*	0.008
Intercept	*7.671*	*8.318*	*8.661*	*6.640*	*7.437*	*7.837*
Adjusted R^2	*0.097*	*0.231*	*0.219*	*0.223*	*0.228*	*0.208*
*Adjusted R^2***	*0.097*	*0.252*	*0.252*	*0.223*	*0.239*	*0.229*

Source: Microcensus surveys.
Employees' households with head in prime age and with two active persons of the main couple.
All coefficients except these marked by * are significant on the level < 0.001
** Marital partner's earning was added to explanatory variables.

In order to estimate the joint effect of a couple's human capital the partner's education was added to a standard Mincerian equation (Table 8). While in 1988 the effect of a partner's education on a person's earnings was insignificant, in 1996 the education of a husband seemed to "increase" his spouse's earnings by 3 percent and in 2002 by 2.5 percent. A wife's earnings exhibited about the same effect on her husband's earnings in 2002. In addition, a person's earnings are also positively affected by the amount of their partner's earnings, an

[5] Although the age of women at the time of their first child shifted considerably, the Czech Republic still has the lowest figure in the EU, according to demographic data (26 years as opposed to 27 in Western Europe, Hungary and Poland).

effect that again increases over time, as the last row in Table 8 shows. This may be caused by both increasing homogamy and the joint decision-making of couples.

4.3. Sources of household incomes and their inequality

Table 9 shows the associations between individual income sources and the resulting standard of living observed using various adjustments of household income. The correlations clearly decrease from the indicator involving full economies of scale to the indicator involving zero economies of scale. The EU indicator is located somewhere in the middle, and it could be used for a comparison over time, but with the cautionary note that it underestimates scale economies in 1988 and overestimates them in 2002.

Table 9 Correlations of income sources with household income in employee households by various measurements (Pearson coefficients)

Income Source	1988					2002				
	Total dispo-sable	Square root	EU indi-cator	Mini-mum incom e	Per capita	Total dispo-sable	Square root	EU indi-cator	Mini-mum incom e	Per capita
	e=0	*e=0.50*	*e=0.59*	*e=0.84*	*e=1*	*e=0*	*e=0.50*	*e=0.59*	*e=0.77*	*e=1*
Total earned	*0.92*	*0.84*	*0.72*	*0.48*	*0.37*	*0.81*	*0.68*	*0.60*	*0.53*	*0.42*
▪ earnings head	0.56	0.55	0.53	0.36	0.28	0.59	0.58	0.56	0.52	0.46
▪ earnings partner	0.62	0.56	0.48	0.29	0.20	0.55	0.41	0.35	0.27	0.18
▪ earnings others	0.53	0.47	0.34	0.26	0.21	0.43	0.29	0.21	0.18	0.12
Total transfer	*0.25*	*-0.04*	*-0.12*	*-0.27*	*-0.33*	*0.01*	*-0.11*	*-0.14*	*-0.16*	*-0.19*
▪ social benefits	0.23	-0.13	-0.20	-0.40	-0.47	-0.07	-0.21	-0.22	-0.24	-0.27
▪ pension benefits	0.10	0.09	0.05	0.05	0.04	0.06	0.02	-0.01	-0.01	-0.02
other income	0.14	0.12	0.12	0.08	0.06	0.53	0.62	0.65	0.63	0.58
Total gross	**0.99**	**0.86**	**0.71**	**0.44**	**0.31**	**0.98**	**0.88**	**0.81**	**0.73**	**0.61**
Tax and insurance	*0.74*	*0.79*	*0.70*	*0.56*	*0.48*	*0.78*	*0.70*	*0.64*	*0.58*	*0.49*
Total net income	**1.00**	**0.82**	**0.68**	**0.39**	**0.25**	**1.00**	**0.89**	**0.82**	**0.74**	**0.61**
Total tax/transfer	-0.30	-0.58	-0.57	-0.62	-0.62	-0.69	-0.67	-0.62	-0.58	-0.51

Source: Microcensus surveys.
For income indicators see the Annex.
e = elasticity coefficient of adjustment of disposable household income to the size of household.

In 2002, there is stronger association between the total disposable household income (whether gross or net) and adjusted income than in 1988. This means that the adjustment within households became less important. The same is true for the correlation between earned income and the adjusted indicator. Only little change over time in the association between adjusted household income and family social benefits is also observed, in spite of the fact that they were rescheduled towards better targeting in reforms introduced in the mid-1990s. In contrast, there is a decrease in the association of the household income level with tax and the contribution burden, in spite of the fact that personal income tax has been rescheduled towards much greater progressiveness.

Unlike the quite considerable change that occurred over time in income packaging (as shown in Table 6), the resulting change in determination of adjusted income looks much smaller. The change would, however, appear to be much stronger if also the shift in the "appropriate" income indicator were taken into account. When comparing adjustment by the living minimum in 1988 (which is more adequate to the situation at that time) and the EU adjustment in 2002, the strength of the association with total disposable income appears to double and the correlation between earned income and adjusted income looks considerably

stronger. Since the (negative) correlation between family social benefits and adjusted income is smaller, while the (positive) correlation between the tax burden and adjusted income is higher, the resulting correlation regarding the net redistribution effect is the same.

Table 10 Regression analysis of adjusted household income in employee households by basic characteristics: dependent variable *ln* household equivalent income by EU indicator

Variable	Regression 1			Regression 2		
	1988	1996	2002	1988	1996	2002
Earnings of the head	-	-	-	0.527	0.607	0.610
Economic activity of the spouse	0.246	0.239	0.211	0.241	0.250	0.217
Other economically active person(s)	0.089	0.117	0.115	0.098	0.145	0.076
Age of the head	0.189	0.055*	0.017*	-	-	-
Children	-0.369	-0.311	-0.393	-0.489	-0.335	-0.397
Years of school – head	-0.051*	0.301	0.276	-	-	-
Years of school – spouse	0.042*	0.196	0.218	0.008*	0.173	0.167
Adjusted R^2	*0.340*	*0.414*	*0.432*	*0.583*	*0.682*	*0.711*

Source: Microcensus surveys.
Note: Only family households with complete couple.
All coefficients except these marked by * are significant on the level < 0.001
EU indicator = equivalence scale is computed so that, the first adult is calculated as 1.0, each additional adult as 0.5, and each child up to 13 as 0.3.

Returning to the stylized facts presented in Scheme 2, the assumptions about the transition to a market economy were at least partly fulfilled (Table 10):

- while the weight of the household head's earnings in the household's standard of living has increased, the weight of economic activity of wife decreased;
- the age of the household head (as a proxy of the life cycle) went from being a major explanatory variable to a negligible one;
- the importance of schooling experienced the opposite tendency, making a man's (and partly also a woman's) education among the leading factors in the determining the household's resulting standard of living;
- the importance of the number of children in the household diminished somewhat in 1996 in comparison with 1988, but increased again in 2002 (due to the weakening effect of family allowances in comparison with rising earned income, not associated with the "family burden");
- all in all, there has been an increase in the amount of variance that is explained by the basic characteristics of the household; the rising importance of education came to outweigh the effect of the life cycle, and the importance of labour market participation and "family burden" diminished only somewhat, when at all.[6]

With regard to the most important correlate of household income, we refer to Gottschalk and Danziger (2005, p. 253), who found that in the United States during the period of 1975-2002, "male wage inequality and inequality of family income closely mirror each other". A similar calculation for the transition period of 1988-1996 in the Czech Republic shows that while inequality of earnings of household heads (measured likewise with a P90/P10 ratio)

[6] After including education, the effects of such variables as occupation and industry in the process leading from a person's earnings to a family's monetary standard of living fell almost to zero. They are therefore not presented in the analyses.

increased by 40 percent, household earnings by 34 percent, and household income (adjusted likewise with a "minimum income" scale) only by 23 percent, in the period of 1996-2002 all the three types of income developed in the same way, with an increase in inequality for all three by 4-6 percent. The rule about the parallel development of personal and household incomes also seems to be valid for post-transition Czech Republic.

5. Conclusion

The aim of this article was to provide a comprehensive picture of the determination of earnings and household income and the relationships between the two. Pre-1990 Czechoslovakia was characterized by the equalization of earnings and, within remaining disparities, by the predominance of individuals' demographic characteristics (gender and age) over their market abilities (skills and occupation) in determining earnings levels. Household income was largely dependent on the number of active earners in a household and the life cycle, and the household budget was overburdened by expenditures on basic needs. The appropriate adjustment of household income would therefore have to apply a steep equivalence scale.

After 1989, the reform process began to rapidly transform the established earnings and income structures. The overall range of inequality in earnings has increased, as have, in particular, returns to education. On the other hand, the gender gap has diminished and the age profile of earnings has become almost flat. In addition to education, occupation also matters much more, owing to the appreciation of managerial and intellectual work, as does industry, and the wage structure by branch has changed considerably. The effect of life cycle has almost disappeared and, even, wider disparities in individual earnings allowed to replace contribution of additional active member in upper income categories.

Packaging of household income is quite different now from what it was 15 years ago. More inequalities are produced by the labour market and the state intervenes more to equalize them. However, the composition of income sources in household income has changed much less than the composition of the economic status of members in households. From the opposite perspective, the new situation in earnings opportunities has given families more decision-making freedom regarding their labour market participation. The former two-earnings model has given way somewhat in favour of a dominant role being taken up by the household head's earnings.

Taken all together, much more than quantitative shifts occurred. It was not exactly a revolution that turned things upside down, but there were also more than just simply evolutionary shifts: a systemic change occurred on one principal axis – the much greater role of education in the entire process. Its importance in the determination of earnings doubled and increased by even more in the determination of adjusted household income, despite the fact that the number of children a person has is no longer dependent on education levels. Nevertheless, the role of the "family burden" in income packaging remained greater than expected. In addition, after a decrease in the effect of children on household income, it increased again since 1996. This, too, is related to the worsening position of children in income distribution.

Annex: Data sources, definitions and adjustment of household income

Data on earnings and household income differ in terms of how the data were collected, the size and representation of the sample populations, the unit of observation and the range of variables.

Regarding *data on earnings*, the most obvious data source is wage statistics based on surveys conducted among firms. The *Czech Statistical Office* (CSO hereafter) has conducted wage surveys, but their coverage has changed over time. Between 1989 and 1992, only companies with 100 or more employees were included; in 1992 the survey began including firms with more than 25 employees and since 1997 it has included firms with more than 20 employees. Banking, insurance and public organizations were included without any size qualification. Whereas between 1993 and 1995, information on wage distribution was estimated by combining various sources, in 1996 and 1997 wage surveys were again conducted, as a sample survey for units with 1-999 employees together with census of all larger organizations, following the recommendations of *Eurostat*. A database called the "Information System on the Average Wage", which is administered by *Trexima*, a private company, for the *Ministry of Labour and Social Affairs*, has existed since 1998 and is used instead of wage surveys for the period since then.

Unfortunately, none of the wage statistics make reference to *household income*. For the analysis at hand there is only one useful source: the household income surveys (Microcensus), collected periodically by the CSO on large samples. These data are adjusted by the CSO for respondents who did not give an answer and in order to make them fully representative of the entire population. In this analysis either the individual or household perspective can be used, or the two can be combined. The only disadvantage is that the surveys differ somewhat. While before 1990 information on wages in these surveys was provided by employers, since then income has been reported by respondents. Income amounts are however also corrected by the CSO using various other sources of information. Before 1996 there are no data available for the variables of occupation and industry. Among the surveys conducted after 1989, the 1992 Microcensus should be omitted from analyses because only final household variables were adjusted, and that makes it difficult to match household and personal income. Characteristics of Microcensus surveys are the following:

Characteristic	1988	1996	2002
Targeted percentage of households	2	1	0.25
Survey sample (N of households)	69,912	27,314	7,678
Non-response rate in percentage of households	4.2	23.8	28.2
Disposable income per capita (thousands CZK yearly) according to:			
- income surveys*)	22.3	63.5	92.9
- aggregate statistics **)	25.9	83.5	122.4
Coverage of income surveys in comparison to aggregate statistics			
	86.1	76.0	75.9

*) Income per capita is weighted by persons.

**) Data of the *Balance of Incomes and Expenditures of the Population* in 1988 and *National Accounts* in 1996 and 2002.

The industry and occupation of economically active persons are not included in any of the surveys before 1996, with the exception of the 1970 Microcensus. This survey was a true Micro-Census, that is, a two-percent sample of the 1970 *Population Census*, in which basic information about people's economic activity was required and was therefore also fortunately

kept in the sample. Unfortunately, only the personal dataset resisted the ravages of time (0.25 percent of economically active persons), but it includes some basic household variables. In any case, the 1970 data are used in this analysis only owing to the lack of relevant variables in the 1989 Microcensus. Due to very slow pace of change under the communist regime, we can consider it as a proxy for the situation before 1990. Otherwise, changes before 1989 are not involved in this analysis (for this see Večerník, 1986 and 1991).

The dependent variable in this analysis is earnings defined as all forms of wage and salary incomes from dependent labour, gross of employee taxes and contributions, but net of employer taxes and contributions. This definition of earnings conforms to the *Luxembourg Income Study (LIS)* definition used in Smeeding and Coder (1993), which is then suitable for cross-national comparison. For the sake of comparability with wage statistics and comparison over time, the analysis focuses on the earnings of the full-time labour force by excluding self-employed and farmers (who are not included in wage surveys either). With regard to household income, the analysis focuses on employee households with a head of household in the prime age category (25-54). Some of the analyses focus also on two active earners.

Unlike earnings, household's living standards measured in monetary terms is a "social construct" rather than a given fact. The result depends largely on the income adjustment chosen, the selection of which is not entirely free of the rule of thumb. Basically, the choices are income per household, income per capita, or – at best – something "in between", which means household income equalized some way. The large diversity of equivalence scales is exhibited in the *LIS* comparative analysis (Buhman et al., 1988), where the continuum of possibilities is expressed by the elasticity coefficient in the formula:

$$W = D / S^e,$$

where W = economic well-being, D = total disposable income, S = size of household and exponent e = elasticity coefficient. The elasticity coefficient varies between *0* (full-scale economies) and *1* (zero scale economies).

In "communist" statistics, the only indicator used was income per capita – no economies of scale were assumed. This was endorsed by the structure of consumption, where costs of individually "divisible items" such as food and clothing were high, while expenditures on housing and common financial payments were low. By contrast, in "Western" statistics the total disposable household income served for a long time as a very frequent indicator, until tax statistics came to be used as the main source of data. However, since the 1980s income surveys have been used, and authors refer to income adjusted to household size and composition. Here it is necessary to stress the importance of the *LIS* as an outstanding institution that develops methods, gathers surveys and provides researchers world-wide by standardized data, thus fuelling comparative research on income, poverty and related policies.

There are numerous variants of measuring instruments which reflect the situations in individual countries at various periods of their development and that can be located on the long continuum of the coefficient *e*. The use and explanatory power of individual income indicators is not an artefact. Income indicators should correspond to the way in which household income is collected and spent, according to the price structure and expenditure constraints. However, adopting indicators that correspond completely to a current, local situation would render it impossible to make comparisons over time and across countries. Therefore, a compromise between universality and adequacy is always necessary.

In comparing the changes since 1990 in the Czech Republic, one can be said that income "per capita" is less and less appropriate as expenditures on "individualized" items (food and beverages, clothing and footwear) decreased from 41 to 28 percent between 1989 and 2003 in employee households budgets. Using comparative figures from 1999, the share of these expenditures was 24 percent in the EU-15 and in the Czech Republic 30 percent; expenditures on housing and energy were 21 percent in the EU-15 and 17 percent in the Czech Republic (Eurostat, 2002). One of reasons for this is that rent regulation still applies to about one-third of all apartments, formerly state-owned but now municipal and private property, in the country.

Three adjusted (equlivalized) income indicators with elasticity located between per household income and per capita income are used here:

1. The adjustment of the size of household by square root where elasticity coefficient is 0.5:

$W = D /(sqrt\ S)$.

2. The EU indicator, where equivalent unit is computed so that the first adult is counted as 1.0, each additional adult as 0.5, and each child up to 13 as 0.3; the elasticity coefficient is somewhat higher than the previous one (0.59):

$W = D /(S/eqEU$.

3. The adjustment that uses the scale implicit to the official subsistence minimum income ((living minimum amounts in the Czech Republic) – this scale is quite steep being shaped conformingly to family budget of low-income categories with a larger share of "individualized" items. Here, the elasticity coefficient is the highest but still quite far from per capita adjustment:

$W = D /(S/eqLM)$.

The first adjustment is frequently used in OECD analyses on income redistribution (Förster, 2004). The second adjustment is applied in the so-called Laeken indicators of poverty widely used by the Eurostat for comparison of EU countries (Atkinson et al., 2002). The third type of adjustment is not frequent as it is strictly national but it was applied, for instance, by Gottschalk and Danziger (2005).

While the first two adjustments are invariable, the third elasticity coefficient has diminished somewhat between 1988 and 2002. The reason is that it is not directly computed but derived from living minimum amount which is valorized not as a summary indicator for a household but by multiplying its individual items (amounts for each person and the shared household costs) and summing them afterwards.

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