Saving from Permanent and Transitory Income.
The Case of Polish Households

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Introduction

The paper analyses the impact of shocks to permanent income and shocks to transitory income on household savings. Using data on household income and expenditures from the panel of Polish households for 1997–2000 we estimate the uncertainty of household's income by decomposing it into a variance of shocks to permanent income and a variance of shocks to transitory income.

Having controlled for demographic and social determinants we have concluded that the household savings in Poland depend more on the degree of uncertainty in permanent income than on the transitory income uncertainty. This is in line with the life cycle permanent income hypothesis model of consumption under uncertainty. We also estimate the uncertainty in permanent and in transitory income using different criteria: age, size of the family, education, occupation, income groups, perception of the income status.

Our empirical results indicate that while the average variances of shocks to permanent and to transitory income for all households do not differ much, they diverge considerably for particular groups of households. A significant part of saving of Polish households may be rather a buffer stock saving (in order to maintain a modest wealth to income ratio) than a long-term retirement saving.

The paper is organized as follows. In the first section we discuss the method used to construct the measures of uncertainty in permanent and in transitory income. In the second section, the data and techniques for estimating the variance of shocks to permanent and to transitory income are described. This part also gives the estimates of these two variances by age, size of the family, occupation, education and place of living. In section three we present our econometric results of the regression of households' saving on

uncertainty in permanent and in transitory income. The last section gives the conclusions.

1. Method of estimating the uncertainty in permanent and in transitory income of households

According to the standard life cycle permanent income hypothesis (LC/PI) consumers smooth consumption over a long-term horizon (Modigliani, Brumberg 1954). To maximize consumption utility over the life cycle, they consume less from the transitory change of income than from the permanent alteration to income (Friedman 1957). Consumers with large transitory income save more. Saving is the present discounted value of the expected future fall in income (Campbell 1987). If income follows a random walk with drift the propensity to consume out of current income does not differ much from the propensity to consume out of permanent income (Hall 1978; Flavin 1981).

Extension of the LC/PI model to account for uncertainty reveals that consumption and saving depend on consumers' perception of the permanence of income (Skinner 1988; Deaton 1991; Carroll 1994). Due to the uncertainty of the future income, the precautionary motive of saving makes consumers engage in the buffer stock saving of a shorter horizon (few years) than is the horizon required for retirement saving, which is the remainder of the life cycle (Carroll 1997; Hubbard, Skinner, Zeldes 1994; Browning, Lusardi 1996; Blundell, Preston 1998).

Predicting the impact of an income change on saving requires knowledge of the degree of uncertainty in future income: consumers with greater income uncertainty, ceteris paribus, should save more out of current income. The uncertainty in future income can be decomposed into two stochastic components: a shock to permanent income and a shock to transitory income (Hall, Mishkin, 1982). In order to do that, we follow the method used by Carroll and Samwick (1997), though we have simplified it mainly due to the insufficient data sources.

Method adopted to measure uncertainty in future income does not allow for direct assertion of two components of income (permanent and transitory) but it allows for a decomposition of the income variance into a variance of permanent and a variance of transitory component of income. This makes the explanation of results difficult because the measures of income uncertainty do not have explicit, definite economic interpretation.

It is assumed that logarithm of permanent income follows a random walk with drift:

$$p_t = g_t + p_{t-1} + \eta_t \tag{1}$$

Where

p_t—logarithm of permanent income,
g_t—predictable component of income growth due to life cycle,
η_t—shock to permanent income in period t.

Decomposition of current income:

$$y_t = p_t + \varepsilon_t \tag{2}$$

y_t—logarithm of current income,
p_t—logarithm of permanent income,
ε_t—transitory error term.

It is assumed that η_t, ε_t are uncorrelated with each other (for different lengths and lags) and have constant variances (according to t).

Removing the predictable component g_t from (1) we arrive at:

$$p_t = p_{t-1} + \eta_t \tag{3}$$

Defining the d-year difference in logarithms of observed incomes as $r_d = y_{t+d} - y_t$ we obtain from (2) and (3):

$$r_d = p_{t+d} + \varepsilon_{t+d} - p_t - \varepsilon_t = \left(\eta_{t+2} + \ldots + \eta_{t+d}\right) + \left(\varepsilon_{t+d} - \varepsilon_t\right) \tag{4}$$

Because the components on the right hand side of (4) are uncorrelated, a variance of r_d equals:

$$Var(r_d) = d\sigma_\eta^2 + 2\sigma_\varepsilon^2 \tag{5}$$

Where
σ_η^2—variance of permanent shock to income
σ_ε^2—variance of transitory shock to income

The unbiased estimator of $Var(r_d)$ for each household i is $v_{id} = r_{id}^2$, if $E(r_d) = 0$ (no individual-specific growth rates for income).

We use v_d of different lengths to solve for σ_η^2 and σ_ε^2 for each household. The unbiased estimates of σ_η^2 and σ_ε^2 are (Carroll and Samwick 1997):

$$s_\eta^2 = v_d - v_{d-1} \tag{6}$$

$$s_\varepsilon^2 = \frac{v_{d-1} - (d-1)s_\eta^2}{2} \tag{7}$$

Later household savings will be regressed on the estimated measures of uncertainty in permanent and in transitory income, controlling for demographic and social variables as well as for the average income over the sample period.

2. Estimating variances of shocks to permanent and to transitory income of households

To estimate variances of shocks to permanent and to transitory income we used data from the Household Budget Surveys (Central Statistical Office, CSO, Warsaw, 1997–2000), refined and adjusted to international structure by the Warsaw Group of CHER (Consortium of the Household Panels for European Socio-economic Research) at Warsaw University, Department of Economics.

The Polish Central Statistical Office surveys ca. 30 thousand of households each year. Data are collected with the use of monthly rotating method, e.g. each month another group of households is surveyed. However, each year a part of households is exchanged and withdrawn from the survey. A particular household is surveyed for a period no longer than four years. It was thus possible to select a smaller group of ca. 3 thousand of households that was surveyed during a full period of four years (1997–2000). This group of households constitutes the panel applied in our research. The panel sample is representative for all Polish households. It allows for a generalization of results to the whole population within a margin of a random error. The monthly data are adjusted by seasonal factor to year base.

The household income measure is the total disposable income of a household, consisting of labour income, social security and other transfer payments, as well as income from ownership of capital. The expenditures are measured as spending on current consumption and durables (excluding investment in houses and financial assets). Household saving is the surplus of household income over expenditures

The total number of households available in the panel was 3054 households surveyed each year during the period 1997–2000. In order to measure savings accurately, we omitted in the panel the households whose saving rates exceeded minus 50% (108 households).[1] The abnormally high negative saving rates might be caused by the method of collecting data (monthly data). For a similar reason we also do not include data on farmers' households (249 households). Due to high seasonal variations of farmer income a monthly measurement of farmer income in the Household Budget Surveys may not give proper results. Farmer household income is not wholly separated from the costs of their farm production and it is sometimes reported as negative income. Also some non-farmer households report sometimes negative income and we omitted them too from the sample (87 households). Finally our panel is composed of 2610 households whose budgets do not show anomalies and are measured each year during four years of the Polish Household Budget Survey 1997–2000.

[1] This is done in the household surveys' cross-section analyses, see for instance Denizer, Wolf 1998.

Income and expenditures enter the calculations in real terms. They are adjusted by monthly CPI indices of income and expenditures in each year of observation, taking year 1999 as a base (1999 = 100). The same year has been applied as a reference point for different classifications of groups of households (age, education level, size of the family etc.) We decided not to adjust our household budget data for the economy-wide growth of income.

Table 1.

Income uncertainty of households in different socio-economic groups

	Estimated variance of income		Percent of total (N = 2610)
	permanent	transitory	
Full sample	0.0415	0.0455	100.00
Income decile groups of households			
1	0.0162	0.0502	10.00
2	0.0000	0.0969	10.00
3	0.0255	0.0583	10.00
4	0.0196	0.0494	10.00
5	0.0455	0.0455	10.00
6	0.0118	0.0692	10.00
7	0.0498	0.0096	10.00
8	0.0169	0.0687	10.00
9	0.0575	0.0201	10.00
10	0.1730	0.0000	10.00
Occupation			
Employees	0.0449	0.0421	40.61
Employees with a small farm	0.0710	0.0502	12.18
Self employed	0.0319	0.1099	6.32
Pensioners	0.0367	0.0262	36.97
Social security income	0.0000	0.1447	3.91
Education of head of household			
Tertiary	0.1124	0.0000	8.35
Secondary	0.0493	0.0387	28.85
Basic vocational	0.0264	0.0707	35.10
Primary	0.0313	0.0443	27.70
Age groups of head of household			
Up to 24	0.0302	0.1209	2.03

	Estimated variance of income		Percent of total (N = 2610)
	permanent	transitory	
25–34	0.0722	0.0460	13.45
35–44	0.0322	0.0606	27.13
45–54	0.0236	0.0660	24.33
55–64	0.0696	0.0073	14.87
65+	0.0350	0.0181	18.20
Sex of the household head			
Male	0.0383	0.0556	64.37
Female	0.0474	0.0272	35.63
Number of persons in the household			
1	0.0303	0.0326	12.18
2	0.0707	0.0073	23.37
3	0.0265	0.0459	20.08
4	0.0062	0.1004	23.10
5	0.0764	0.0354	12.26
6+	0.0577	0.0341	9.00
Type of family			
Single family	0.0303	0.0326	12.18
Couple without children	0.0714	0.0009	16.93
Couple with 1 child	0.0292	0.0407	11.23
Couple with 2 children	0.0148	0.0880	15.40
Couple with 3 children	0.0698	0.0393	7.20
Couple with 4+ children	0.0208	0.0792	3.30
Single mother	0.0237	0.0580	3.68
Single father	0.0000	0.0817	0.19
Others	0.0455	0.0519	29.89
Place of living by size of town (in ths)			
500 and more	0.0371	0.0576	7.55
200–500	0.0591	0.0230	9.54
100–200	0.0725	0.0000	6.93
20–100	0.0351	0.0349	20.92
Less than 20	0.0336	0.0345	15.56
Village	0.0392	0.0667	39.50

	Estimated variance of income		Percent of total (N = 2610)
	permanent	transitory	
Perception of income status			
Very good	0.0176	0.1101	0.38
Good	0.0340	0.0678	10.08
Average	0.0687	0.0137	53.14
Bad	0.0000	0.0828	22.57
Very bad	0.0111	0.0887	13.83

Source: Polish Household Budget Surveys, CSO, Warsaw, 1997–2000.

The distribution of households in the panel by different categories in all tables is based on the structure of households in 1999. Some estimates of the variance showed negative values. They have been replaced in the tables by 0.000 indicating results not statistically different from zero.

Table 1 shows that the overall variance of permanent income for full sample is only slightly lower than the variance of transitory income. It indicates that income of Polish households follows a random walk. However, such result may also be influenced by the fact that a period of observation is short.

The uncertainty of permanent income is highest for two top income decile groups of households. In the case of transitory income uncertainty, the situation is quite different. Households in the bottom income deciles face high uncertainty of transitory components of income while their permanent income component is quite stable. It shows that the stability of incomes of those who gained from the transformation of the Polish economy still remains low. On the other hand, those who did not adjust to the market economy secure some stability of income, but their incomes are very low.

The median saving rates of Polish households rise considerably when moving up the income decile groups. It says that the absolute level of income is an important determinant of saving rate. Very high saving rates (15–23% of income) of the top income decile groups, having high uncertainty of transitory income, may indicate a precautionary, buffer stock character of a large part of their savings.

The transitory income uncertainty is the highest for households of four persons and more, while the permanent income uncertainty is high in the families of two persons and also in biggest households. It is due to the fact that two persons' households consist mainly of adults who earn income (single parents form only 4% of households). Households of more than four persons have mostly two children. Couples with two children face the highest transitory income uncertainty.

As one can expect from this analysis, families with two children and households of four persons report highest median saving rates (above 11%,

when the average median saving rate during the years 1997–2000 for all households was 9%). The reason for saving in these households is mainly precautionary, to protect the family against unexpected shocks, but also to provide education for children and to help them start an independent life. This second aspect of saving is more long-term. From the abovementioned, we can reach a conclusion that the size of a household and the number of children are the determinants of saving rate.

It is also worth mentioning that single parents face high transitory income uncertainty: more in case of single fathers than in case of single mothers. Single fathers have higher income (by about 25%) than single mothers and they save more, though single mothers also save around the average. Single parents precautionary saving is a new phenomenon after the transformation of the Polish economy. Under the previous system, single parents were mainly women of a very low material status, who become single mothers unwillingly, mainly due to divorce. Today being a single parent is a matter of private choice. The division of households by gender of the household head shows stable differences between households headed by men and those headed by women. Households headed by men report higher incomes and higher savings (by one third). Their uncertainty is higher for transitory income than for a permanent component of income. Households headed by women face higher uncertainty of a permanent component of income. It means that they receive less transitory incomes and the stability of their long-term income is lower than that of households headed by men.

Occupation status of the head of the household plays a role in income uncertainty, especially in the case of the self-employed. They have very high uncertainty of transitory income. It goes together with the highest average income of the self-employed as compared to other groups of households. However, their saving rate is below the average median saving rate for all households. If farmers were included into our sample, they would probably also exhibit a very high income uncertainty.

The highest saving rates are reported by a group of employees who also own some land used for farm production. This group combines the relative certainty of permanent income from employment with high, but uncertain income from farm production.

The level of education does not influence the income uncertainty in a way one would predict, especially when it concerns persons with tertiary education. For this group, the transitory income uncertainty is low and the uncertainty of permanent income is high. Households headed by persons with tertiary education report highest income and—till 1999—the highest saving rates. A relative worsening of their income in 2000 is connected with a slowdown of the economy, but this group is still at the top of the income ladder. The other group of households with opposite uncertainty is a group headed by persons with basic vocational education. Their transitory income is very

uncertain and their incomes, as well as their saving rate, are the second highest among all households.

The saving behaviour of the households headed by persons with basic vocational education is very interesting. They are often self-employed, investing private saving in small businesses, often in small cities and in the countryside. This group, together with that of tertiary education, was one of the driving forces of the first stage of transformation of the Polish economy.

Place of living affects the income uncertainty too. The highest transitory income uncertainty in the biggest cities above 500 thousand inhabitants and in villages corresponds with the abovementioned analysis of the occupation structure. The variations of income affect people in the countryside and in the biggest cities most. In big cities there are more chances for earning but not for all who live there due, for example, to their low educational status or less demanded occupation. In the middle-sized cities the uncertainty of permanent income is higher and it often comes out from the old industrial structure that is no longer efficient today. It is especially so in cities built around one-two big factories or mines that close down or go bankrupt.

The structure of households by age of the household head affects income uncertainty in a specific way. The variance of transitory income is highest for the youngest households, while the variance of permanent income is high for those in the age group of 55–64 years, as well as for the young in the age of 25–34 years. The young households (below the age of 35) report the highest incomes in the sample and also highest saving rates. It is a specific feature of the transformation of the Polish economy. The young generations out-passed the older generations in income growth and levels in a very short time. It was mainly due to their employment or production activity in the most modern sectors of the economy (high-technology, financial sector, domestic and foreign trade). The slowdown of the economy in 1999–2000 worsened the income position of this group slightly, but did not undermine its leading role.

In Poland, the pre-retirement age group (55–64) is, in fact, a group of early retirement, thanks to very liberal early retirement rules (the early retirement age for women is 55 and 60 for men). Members of this group who experience unemployment or are just unprepared to adjust to the competitive market economy retire early with a lost of their personal income and at the rising costs of the pension system. According to the law on the reform of the pension system in Poland in 1999 people at the age above 50 at that time had to remain obligatorily in the pay -as-you-go (PAYG) system. The pension reform was designed to create a multi-pillar pension system consisting of the reformed PAYG pillar and a funded pillar. The mandatory funded second pillar of the new pension system absorbs one fifth of the total contribution to the pension system. It was meant to create new financial market for privately owned and privately managed pension funds. It was to be supplemented by non-mandatory pension funds as a way of saving for an extra pay to the future pension from the mandatory system.

However, this non-obligatory part of the pension system did not emerge yet in Poland. Household savings are invested in life insurance, in investment funds, on bank accounts, but rarely in pension funds. The majority of consumers in Poland still count mainly on the public pension system. People who save additionally for retirement are those in the age group of 45–54 years. Variation of their permanent component of income is the lowest in the sample. Their income position is quite stable, but they have to make up for the deficiencies of the old PAYG system and for rising costs of living after a change of economic system in Poland. These are the generations of the post-war baby boom.

The last criterion we examined in relation to income uncertainty was the perception of income status by the household. Very good and very bad perception of one's own income status turned out to be associated with highest variance of transitory income. Those who judge their wealth situation as good save the most because they are probably not certain about their income in the future. Persons who evaluates their position as average save the least despite a high variance of their permanent component of income. This group seems to be unable to change its income status.

Table 2.

Income uncertainty in groups of households by cross classification (occupation, age, education, place of living)

	Estimated variance of income		Percent of total (N = 2610)
	permanent	transitory	
Full sample	0.0415	0.0455	100.00
Employees, age < 35, tertiary education	0.1200	0.0014	0.88
Employees, age < 35, secondary, town > 200	0.2044	0.0409	0.84
Employees,, age < 35, secondary, town 20–200	0.0337	0.0424	1.30
Employees, age < 35, secondary, town < 20	0.1034	0.0435	1.88
Employees, age < 35, vocational, town > 200	0.0000	0.1607	0.42
Employees, age < 35, vocational, town 20–200	0.0119	0.0819	1.00
Employees, age < 35, vocational, town < 20	0.0379	0.0781	4.90
Employees, age < 35, primary	0.1256	0.0000	1.30
Employees, age 35–54, tertiary, town > 200	0.0503	0.0456	0.88
Employees, age 35–54, tertiary, town 20–200	0.1108	0.0000	0.92
Employees, age 35–54, tertiary, town < 20	0.1350	0.0000	1.69
Employees, age 35–54, secondary, town > 200	0.0000	0.1229	2.26
Employees, age 35–54, secondary, town 20–200	0.0511	0.0155	4.67
Employees, age 35–54, secondary, town < 20	0.0202	0.0592	6.32
Employees, age 35–54, vocational, town > 200	0.0195	0.0557	2.22

	Estimated variance of income		Percent of total (N = 2610)
	permanent	transitory	
Employees, age 35–54, vocational, town 20–200	0.0633	0.0137	4.14
Employees, age 35–54, vocational, town < 20	0.0319	0.0717	9.81
Employees, age 35–54, primary, town > 200	0.0412	0.0424	0.73
Employees, age 35–54, primary, town 20–200	0.0001	0.0402	0.88
Employees, age 35–54, primary, town < 20	0.0000	0.0980	3.26
Employees, age 55+, tertiary	0.1853	0.0000	0.31
Employees, age 55+, secondary	0.0918	0.0084	0.54
Employees, age 55+, vocational	0.0585	0.0277	0.84
Employees, age 55+, primary	0.4879	0.0000	0.80
Self employed, age < 35	0.0462	0.1004	1.00
Self employed, age 35+, tertiary	0.2073	0.0000	0.80
Self employed, age35+, secondary	0.1388	0.0000	1.76
Self employed, age 35+, vocational and primary	0.0000	0.2486	2.76
Pensioners, age < 35	0.0189	0.0901	1.00
Pensioners, age 35–54, tertiary	0.0750	0.0000	0.42
Pensioners, age 35–54, secondary	0.0573	0.0342	2.26
Pensioners, age 35–54, vocational	0.0480	0.0561	3.33
Pensioners, age 35–54, primary	0.0000	0.1416	2.99
Pensioners, age 55+, tertiary, town > 200	0.0484	0.0087	1.15
Pensioners, age 55+, tertiary, town 20–200	0.0579	0.0000	0.57
Pensioners, age 55+, tertiary, town < 20	0.2235	0.0000	0.57
Pensioners, age, 55+, secondary, town > 200	0.0574	0.0000	1.95
Pensioners, age 55+, secondary, town 20–200	0.0324	0.0280	2.72
Pensioners, age 55+, secondary, town < 20	0.0055	0.0482	1.88
Pensioners, age 55+, vocational, town > 200	0.0108	0.0280	0.96
Pensioners, age 55+, vocational, town 20–200	0.0284	0.0050	1.76
Pensioners, age 55+, vocational, town < 20	0.0358	0.0304	2.18
Pensioners, age 55+, primary, town > 200	0.0228	0.0529	1.53
Pensioners, age 55+, primary, town 20–200	0.0441	0.0000	3.52
Pensioners, age 55+, primary, town < 20	0.0262	0.0439	12.07

Source: Polish Household Budget Surveys, CSO, Warsaw, 1997–2000.

For a purpose of completeness we showed all sub-groups of households chosen by cross criteria (source of maintenance + age + education + place of

living) even if the size of some households groups was small, below 1% of the total number of households.

From the abovementioned detailed grouping of households in table 2, one can read that the groups with highest transitory income uncertainty can be found among:

a) the self-employed with only primary and basic vocational education,
b) employees aged bellow 35 years with basic vocational education, living in cities of above 200 thousand inhabitants,
c) pensioners and social security beneficiaries in the age group of 35–54 years with only primary education. All pensioners and social security beneficiaries in the age group of 35–54 years account for 9% of all households. This group mirrors all the weaknesses of the previous social security system and is too large by any standard (Liberda 1999).

The highest permanent income uncertainty is faced by:

d) employees older than 55 years of age with primary education. This group bears the highest risk of losing the only source of living.
e) pensioners older than 55 years of age with tertiary education living in very small cities below 20 thousand inhabitants. The chances of maintaining the income status are lower in small localities even for those with tertiary education.
f) self-employed older than 35 years of age with tertiary education.

The above-specified smaller groups of households support earlier findings from more general grouping of households indicating the decisive role of self-employment, education and age above 55 years as the main determinants of high income uncertainty of Polish households.

3. Dependence of savings on income uncertainty

Having estimated the variances of shocks to permanent and to transitory income components we regress the household savings on these measures of income uncertainty, controlling for the demographic and social variables as well as for the average income over the sample period.

The estimated equation is:

$$S = \alpha_0 + \alpha_1 s_\eta^2 + \alpha_1 s_\varepsilon^2 + \alpha_3 P + \boldsymbol{X}\beta + u \tag{8}$$

Where:

S—household monthly savings,
s_η^2—estimated variance of permanent shock to income,
s_ε^2—estimated variance of transitory shock to income,
P—average household income over the sample period,
$\boldsymbol{X}$—vector of demographic and social characteristics of household.

Several dummy variables account for: a group of households with a head of tertiary education, a group of employees plus pensioners, place of living

below 20 thousand inhabitants, households without children, households not possessing a house.

The variables tested were:
VAR_PERMANENT = estimated variance of permanent income,
VAR_TRANSITORY = estimated variance of transitory income,
INCOME_AVG = average household income over the period of 1997–2000,
SEC_EDU = households with a head of secondary education,
VOC_EDU = households with a head of vocational education,
PRIM_EDU = households with a head of primary education,
AGE = age of the household head,
AGE_SQR = square of the age of the household head,
SELF_EMPL = self-employed head of the household,
TOWN_>20 = households in towns above 20 thousand of inhabitants,
CHILD_<17 = households with children below age 17 years,
HOUSE_OWNERS = households owning a house.

The results of the OLS regression are presented in Table 3.

Table 3.

Household saving (saving rate > –0,5)

Variables	Non-standardized coefficients		Standardized coefficients		Sig. *t*
	b	Standard error	Beta	*t*	
Constant	–115.946	99.483		–1.165	0.244
VAR_PERMANENT	237.052	54.757	0.185	4.329	0.000
VAR_TRANSITORY	123.447	50.555	0.103	2.442	0.015
INCOME_AVG	0.273	0.010	0.542	27.257	0.000
SEC_EDU	127.688	32.761	0.120	3.898	0.000
VOC_EDU	166.615	33.233	0.165	5.014	0.000
PRIM_EDU	183.407	35.530	0.170	5.162	0.000
AGE	–12.003	3.519	–0.362	–3.411	0.001
AGE_SQR	0.106	0.034	0.335	3.150	0.002
SELF_EMPL	–155.512	34.127	–0.078	–4.557	0.000
TOWN_>20	64.772	19.735	0.057	3.282	0.001
CHILD_<17	–21.954	7.618	–0.056	–2.882	0.004
HOUSE_OWNERS	–60.528	20.352	–0.051	–2.974	0.003

Adjusted R^2 = 0.279

All coefficient estimates are statistically significant at 5% level.

Both variances of shocks to permanent income and to transitory income have positive effects on household saving. The effect of permanent income is higher than the transitory income effect on saving. These results would indicate that, while the variances of transitory and permanent income compo-

nents are, on average, very similar, Polish consumers are not very sensitive to transitory income. It is indicated also by a high correlation of saving with the absolute level of long-term income. The average household income may be treated here as an approximation to the permanent income of a household.

The estimated age profile shows the expected non-linear effect.

The effect of education (measured in relation to the group of households with tertiary education) diverges from the typical findings of a positive effect of education on saving in the more developed economies. In Poland, the share of households with a tertiary educated head is quite low (around 10%) and, on the other hand, the influence of people with a lower level of education is bigger. The last group is not only more numerous but also optimistic about possible gains from investing instead of consuming in the new economic environment in Poland.

The regression results confirm our earlier hypothesis that self-employment can be negatively associated with saving. It may also be due to the measurement problems of incomes of self-employed outside agriculture. Unlike farmers, they do not report negative incomes; on the contrary, their incomes belong to the highest among all households. But, for tax purposes, this group may report many investment expenditures as household consumption (like cars, computers, office space at home, etc.).

Other interesting result from the regression analysis is a positive effect of living in small localities (below 20 thousands inhabitants) on saving. It comes out from the fact that more than a half of population lives there, and among them those who save the most (young, with a basic education, self-employed).

Ownership of a house (a flat) affects savings in a negative way. Households not owning a house are in minority (1/5). They save more but their incomes are lower, as compared to house owners. The coefficient on this variable may be influenced by the parameter on an average income.

The number of children affects household savings negatively as one could expect. Taking this variable not separately, but with a number of adults in the family, changes the sign of the coefficient, but the result is not statistically significant.

4. Conclusions

This paper shows that households facing higher income uncertainty save more. For a panel of Polish households for 1997–2000 we estimated the uncertainty of permanent and transitory components of income. Our results indicate that the average variances of permanent and transitory income of Polish households do not differ much. It may result from violent changes of wages and income structure due to the transformation of the Polish economy.

However, the variances of permanent and transitory income differ for particular groups of households, which we examined. We regressed household saving on income uncertainty and show that both measures of income uncertainty in permanent and in transitory income are statistically signifi-

cant in predicting saving. The permanent income uncertainty affects savings more than the transitory income variance.

It would indicate that households' saving in Poland is mostly driven by life cycle retirement motive. Nevertheless, the detailed analysis of income variances in groups of households suggests that a significant part of households' saving in Poland may be more of precautionary, buffer-stock than of permanent character.

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Abstract **Saving from Permanent and Transitory Income. The Case of Polish Households**

The paper analyses the impact of income uncertainty on household saving. Using a panel of Polish households for 1997–2000 we decompose uncertainty of household income into a variance of shocks to permanent income and a variance of shocks to transitory income. Then we regress households' savings on the estimated measures of income uncertainty controlling for demographic and social variables. Our empirical results indicate that the average variances of permanent and transitory income of Polish households do not differ much. Both measures of income uncertainty are statistically significant in predicting saving. The permanent income uncertainty affects savings more than the uncertainty of transitory income. A significant part of households' saving in Poland may be of precautionary, buffer-stock character.

This paper is the CHER (Consortium of the Household Panels for European Socio-economic Research) Working Paper, 2003, No. 15, presented at the 28th General Conference of the International Association for Research in Income and Wealth in Cork, Ireland in 2004 and at the CHER workshop in Spain, 2002.

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