Kłopocka Aneta Maria
PhD (Economics), Assistant Professor,
University of Finance and Management in Warsaw,
55 Pawia Str., Warsaw, 01-030, Poland
anetaklopocka@poczta.onet.pl

HOUSEHOLD SAVING BEHAVIOR AND DEMOGRAPHICS

Abstract: Financial stability of an economy is significantly influenced by the evolution of the household saving behavior. The financial turmoil that started in 2007 and the severity of the recession that followed highlight the importance of household financial stability as one of the key factors affecting economic growth.

Household saving behavior is determined by a complex of economic, social, demographic and cultural factors. The deeper understanding of the influence of demographic determinants on household saving is essential for predicting future trends in household saving behavior in response to the forecasted population ageing.

This paper uses the household budget survey (HBS) conducted in 2011 by the Central Statistical Office to shed light on the demographics effects on the household saving behavior in one of the Central and Eastern European countries, i.e. Poland. Unit records from 37,375 Polish households are available. With micro data, it is possible to account for various household characteristics that are not available to researchers undertaking macroeconomic analyses, but are important for explaining differences in saving decisions.

The results of the One-way Analysis of Variance (ANOVA) support the view that age constitutes a significant determinant of household saving behavior. It can also be seen that the households of retired persons exhibit positive and high saving rates, rather than dissave, as suggested by the original LCH. Their saving propensity is significantly higher than that of younger households.

Keywords: household saving behavior; Poland; demographic determinants; age; Life Cycle.

JEL Classification: D91, D12.

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Introduction

The saving behavior has continued to attract the interest of economists both at theoretical and empirical levels due to the important role that national

savings play in economic growth process[1]. Long-term economic growth requires capital investment. Higher levels of domestic savings allow a larger portion of a country's overall debt to be financed internally. Analysts consider this to be more sustainable option than high debt levels primarily financed by external (foreign) creditors[2]. Hence, domestic savings support the economic sovereignty of a country (Rytelewska, 2005; Olszewska, 2010; Aridas et al., 2010). National savings reflect the intertemporal choice of the three principal subsectors of the economy: households, business, and general government. The vast majority of studies on saving behavior concentrates on household saving due to the importance of household saving in the determination of national saving: generally, most of the saving comes from the surplus household sector, and the deficit private corporate and public sectors draw on household savings to meet their investment requirements and finance the resource gaps.

Household savings are very important not only in terms of macroeconomics but in the microeconomics perspective, as well. Savings reduce household exposure to the liquidity risk, raise the ability to withstand income and demand shocks, protect against the potential insolvency and its adverse socioeconomic consequences. Kłopocka (2017) elaborates on the significance of household saving for their economic security.

From the household's point of view saving represents a decision not to consume current income. Browning and Lusardi (1996) notice the considerable heterogeneity in the motives for saving: "It is unlikely that a single explanation will suffice for all members of a population at any given time or even for the same person over a long stretch of time". Furthermore, these motives are complementary and actual saving is determined by the complex set of reasons (Browning and Lusardi, 1996). Schunk (2009) shows that heterogeneity in saving behavior is systematically related to the importance that households attach to different co-existing saving motives.

The absolute income hypothesis (Keynes, 1936), the permanent income hypothesis (PIH) (Friedman, 1957) and the life-cycle hypothesis (LCH) (Modigliani and Brumberg, 1954) are the starting points for analyses of household saving behavior. Kośny and Piotrowska (2013), Attanasio and Weber (2010), Rytelewska (2008), Bańbuła (2006), Liberda (2000), Browning and Lusardi (1996) and others provide a critical surveys of the large literature on the models of intertemporal allocation. Psychology has contri-

[1]Misztal (2011), Ciftcioglu & Begovic (2010) are examples of recent studies indicating a positive relationship between domestic savings and economic growth in emerging and developing economies.

[2]Very strong household savings have traditionally financed Japan's very large debt burden, but the country has seen a significant decline in saving rates in the new millennium (A. Kłopocka, 2014).

buted theories and techniques for studying the cognitive, motivational and social factors that affect saving.

A number of empirical studies have estimated the effect of various economic and demographic variables on household saving. Age, income, income uncertainty, wealth, risk tolerance, saving horizon, homeownership, household composition, health status, education, race/ethnicity, self-employment, and unemployment are the most often tested factors at the micro level (see Fisher and Anong, 2012 as well as Grejcz and Żółkiewski, 2017 for the literature review).

Table 1. **"Life-Cycle" effects on private savings behavior: a review of empirical studies**

Item	Effect on the savings rate of a 1% point rise in the dependency ratio	
	youth dependency ratio	*elderly dependency ratio*
Cross-section studies		
Modigliani (1970)	-0.20	-0.88
Feldstein (1980)	-0.77	-1.21
Modigliani and Sterling (1983)	-0.13	-0.51
Horioka (1986)	-0.92	-1.61
Koskela and Viren (1989)	-0.73	-0.76
OECD (1990)	…	-0.93
Horioka (1991)	-0.44	-1.09
Time-series studiem		
Shibuya (1987)	…	-0.34
Masson and Tryon (1990)	-1.10	-1.10
Horioka (1991)	-0.30	-1.13
Masson et al. (1998)	-0.14	-0.14
Loayza et al. (2000)	-0.07	-0.22
Simple unweighted average of the estimation results	-0.52	-0.75
Household data studiem		
Hayashi et al. (1988) Bosworth et al. (1991) Auerbach and Kotilkoff (1987) Canari (1994) Börsch-Supan (1996)	These studies question the applicability of the life-cycle model on the basis of the observed savings behaviour of the elderly in household data. The coefficients on the old age and *youth dependency ratios* in these studies are "near zero".	

Source: McMorrow and Röger (2004)

Rates of return, economic and political uncertainty, borrowing constraints, financial depth, fiscal policy, pension system, income and wealth distribution are examples of the macro determinants (Loayza et al., 2000).

McMorrow and Röger (2004) note that "while most econometric studies do discover a significant and numerically important association between

demographic variables and aggregate saving rates, other studies using household survey evidence challenge that view and suggest that any effect on the savings rate may be negligible" (see Table 1). In the recent literature review Hassan et al., (2011) acknowledge the contradictory results and enumerate several explanations of this saving puzzle (such as bequest motive, the risk of high medical expenses, among others).

Most of the studies focus on the long-established market economies. More attention needs to be devoted to the post-communist countries, distinguished by the impact of the years of communist rule that are not covered sufficiently by the literature. The goal of this study is to shed light on the demographics effects on the household saving behavior in one of the Central and Eastern European countries i.e. Poland. Due to the current and foreseen demographic trends and the serious policy implications of population ageing this paper concentrates on the investigation of the age - saving behavior relationship.

The major transformation has occurred in the household saving behaviour in Poland in recent years. This is due to sharp changes in the functioning of the households in the period of economic transformation and is the result of the global financial and economic crisis. Niculescu-Aron and Mihăescu (2012) reveal that the former communist countries had a strong orientation towards saving until 1990. The high values of the saving rates were determined, on the one hand by the wish to be able to finance various acquisitions, especially durable goods or cars, and on the other hand, by the shortage of consumption goods (involuntary saving). After 1990 the important political, economic, social and cultural transformations have stimulated the consumption behaviors and the saving rate registered considerable decreases.

Kośny (2013) has analyzed the economic situation of households in Poland in the period 2000-2010. He suggests that savings increase in periods of slower economic growth whereas in the fastest growth period (2005-07) a significant decrease in the level of savings was observed. He suggests that a possible explanation for this phenomenon may be found in the purpose of savings. Most households declare that they are saving ‘for a rainy day’ - 64% in the upper income group and 61% in the lower income group (2011). In this context, a good economic situation may lead to the use of such savings for various types of expenditure. This explanation is in accordance with the results of Nofsinger (2012) for developed economies. He demonstrates that household behavior exacerbates the boom/bust economic cycle. In boom times, the increase in debt load and decrease in saving rate spurs economic growth. In bust times, households repay debt and save more, which drags on an already slow economy.

The changing economic situation exerts a profound influence not only on the propensity to save but on the structure of allocation of personal savings invested in financial assets, as well (A. Kłopocka, 2013). Dębski and

Świderski (2011) empirically show that when the economic situation improves in Poland, more personal savings are allocated in shares quoted on the organised market and in mutual funds and less savings are allocated in deposits and debt securities, the share of cash also drops, but when the economic situation is unfavourable, resulting in a decline in the stock exchange market and an increase in interest rates, the above mentioned figures behave in the opposite manner.

Anioła and Gołaś (2013) concentrate on the identification of the socio-demographic factors affecting the saving rate of Polish households. They show that household financial behaviors are influenced by: gender, age, level of education, disability as well as the socio-occupational status and income level. According to the results of an earlier study conducted by Rószkiewicz (2004) on the sample of Polish households income appears to be the main determinant that differentiates the propensity to save and the types of financial behavior patterns. Important role of psychological conditionings was revealed, too. Rószkiewicz (2006) shows that the precaution and life cycle motives of saving are observable in the Polish society but restrain seems to be marginal. In addition, attitudes towards saving are varied by some demographic and socio-economic features. Poles with higher social-economic position are rejecting self-restraint shifting towards consumerism. Rytelewska and Kłopocka (2010) demonstrate that the strong growth of the elderly dependency ratio in Poland will result in the decrease of the saving ratio, whereas the negative influence of the growth of the elderly dependency ratio may be weaker thanks to the changes in the age structure of the professionally active persons.

Data and methodology

This paper uses the household budget survey (HBS) conducted in 2011 by the Central Statistical Office. Unit records from 37,375 Polish households are available. With micro data, it is possible to account for various household characteristics that are not available to researchers undertaking macroeconomic analyses, but are important for explaining differences in saving decisions.

A One-way Analysis of Variance (ANOVA) was used to examine whether household propensity to save is a function of the household head's age. The independent variable divided the sample into fourteen different age groups (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80 and more). The dependent variable was the household propensity to save measured by the household saving rate. Household saving is defined as the difference between household available income (mainly wages received, revenue of the self-employed and net property income) and consumption (expenditure on goods and services). The saving rate is calculated by dividing household saving by household available income. The saving rates considered here are the "flow" measures, and

do not reflect variations in the "stock" of wealth of households. The holding gains or losses on assets and liabilities, in particular the realised and unrealised gains/losses on equities or real estate, are not included in these measures of savings.

Results

An overall analysis-of-variance test is conducted to assess whether means on the saving rates are significantly different among the age groups. See Table 2 for the means, standard deviations and other descriptive statistics for each of the age groups.

An alpha level of .05 was used for all analyses. The null hypothesis (H_0) tested in the One-way ANOVA is that each of the age group means is equal.

Table 2. **Descriptive statistics for the age groups**

Age category	N	Mean	Median	SD	Min	Max
15-19	110.00	4.02	4.45	29.98	-136.28	64.89
20-24	1094.00	-0.55	11.06	146.29	-4410.22	93.75
25-29	2489.00	2.93	17.78	240.54	-10919.44	97.05
30-34	3320.00	2.24	20.73	219.57	-10028.21	94.38
35-39	3588.00	-38.40	16.85	2271.04	-135311.49	92.44
40-44	3326.00	-3.81	15.81	204.79	-5304.69	94.52
45-49	3517.00	-6.98	16.00	251.41	-8557.19	95.92
50-54	4128.00	-28.59	14.74	759.92	-34413.48	91.35
55-59	4239.00	-24.32	13.24	845.52	-42291.07	91.97
60-64	3750.00	-9.62	14.07	554.88	-26640.05	93.04
65-69	2352.00	8.56	15.58	43.99	-534.02	83.89
70-74	2061.00	5.24	12.90	51.30	-985.66	94.06
75-79	1772.00	10.48	16.26	46.87	-635.92	86.81
≥80	1561.00	9.87	17.80	68.54	-1667.02	86.05

Source: Own research

H_0: $\mu_1 = \mu_2 = ... = \mu_{14}$

The alternative hypothesis (H_a) is that at least one group mean significantly differs from the other group means (i.e. that at least two of the group means are significantly different).

To test the assumption of normality, we use the Shapiro-Wilks test. The results (table 3) demonstrate that the assumption of normality has been rejected for this sample.

The Levene's *F* Test for Equality of Variances is used to test the assumption of homogeneity of variance. The test for homogeneity of variance was significant [Levene F(13, 37293) = 2.56, p < .05] indicating that this assumption underlying the application of ANOVA was rejected. Therefore we use an adjusted F statistic provided by the Welch statistic and the Brown-Forsythe statistic. The F ratio is found to be significant with either the Welch statistic [F(13, 4976.266) = 4.90, p < .05] and the Brown-Forsythe statistic [F(13, 6383.487) = 1.429, p < .05] indicating that not all fourteen age groups resulted in the same standardized test score.

Table 3. **Shapiro-Wilk test results**

Age category	Shapiro-Wilk Statistic	df	Sig.
15-19	.930	110	.000
20-24	.161	1094	.000
25-29	.076	2489	.000
30-34	.109	3320	.000
35-39	.009	3588	.000
40-44	.140	3326	.000
45-49	.119	3517	.000
50-54	.041	4128	.000
55-59	.029	4239	.000
60-64	.030	3750	.000
65-69	.733	2352	.000
70-74	.624	2061	.000
75-79	.625	1772	.000
≥80	.412	1561	.000

Source: Own research

Post hoc comparisons using Games-Howell procedures were used to determine which pairs of the fourteen age group means differed. The results revealed:

- the significant differences ($p<0.05$) between: 40-44 and 65-69, 40-44 and ≥80, 45-49 and 65-69, 45-49 and ≥80 age groups,
- and the significant differences ($p<0.01$) between: 40-44 and 75-79, 45-49 and 75-79 age groups.

In all mentioned cases households of older heads (in the age of 65-69, 75-79, ≥80) demonstrated significantly higher saving rates than younger households. Rather than dissave, as suggested by the original LCH, it is observed that older households continue to increase savings well past retirement age. This is in line with some other studies listed by Hassan et al. (2011), revealing the observed puzzling saving behavior of the aged people.

Conclusions

The financial turmoil that started in 2007 and the severity of the recession that followed highlight the importance of household financial stability as one of the key factors affecting economic growth. Household savings are very important not only in terms of macroeconomics but in the microeconomics perspective, as well. Savings reduce household exposure to the liquidity risk, raise the ability to withstand income and demand shocks, protect against the potential insolvency and its adverse socioeconomic consequences.

Household saving behavior is determined by a complex of economic, social, demographic and cultural factors. The deeper understanding of the influence of demographic determinants on household saving is essential for predicting future trends in household saving behavior in response to the forecasted population ageing.

Most of the studies focus on the long-established market economies. More attention needs to be devoted to the post-communist countries, distinguished by the impact of the years of communist rule that are not covered sufficiently by the literature. The goal of this study is to shed light on the demographics effects on the household saving behavior in one of the Central and Eastern European countries i.e. Poland. Due to the current and foreseen demographic trends in Poland and the serious policy implications of population ageing this paper concentrates on the investigation of the age - saving behavior relationship.

The results of the One-way Analysis of Variance (ANOVA) indicates that there are significant differences among the sample saving rate means, a greater difference than would be expected on the basis of chance alone. It can also be seen that the households of retired persons exhibit positive and high saving rates. Their saving propensity (as measured by the saving rate mean) is significantly higher than that of younger households.

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