Real Returns, Interest Income Tax, and Household Saving in Bulgaria

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Summary:

The interest rate is the principal determinant of the inter-temporal choice of all economic agents. As such, it takes center stage in economists' attempts to explain the dynamics of household consumption and saving. This article joins the debate by attempting to estimate the effects of interest rate changes on household saving in Bulgaria in light of the recent introduction of an interest income tax. By applying cointegration and vector error-correction techniques to data for the period 2000 – 2014, the study finds a weak negative association between the two variables, indicating the potential existence of target saving. This result is attributed to the low levels of household incomes and the unavailability of sufficient liquid assets for most of them, as well as to the low level of development of most financial market sectors. It explains the absence of a significant effect on saving from the introduction of the tax in 2013 and also exposes the weak effects of other potential policy measures aimed at altering household consumption and saving through changes in rates of return.

Key words: interest rates, household saving, cointegration

JEL Classification*: D91, E21, E43*

1. Introduction

According to economic theory, economic agents constantly have to make choices. They have to choose between different products, between various investment opportunities, between 'now' and 'later', all because of the scarcity of the available resources. These choices always involve a certain price – one thing is always traded in exchange for something else. One such choice, which has a central role in contemporary economics, is the choice that people (households) need to make between consumption today and consumption later, or, in other words, between consumption and saving. Theoretically, the objective is to maximize utility over the long run – the person's lifetime, subject to a number of constraints. The interest rate is at the centre of this process, with higher rates traditionally being associated with higher saving and lower rates – with lower saving.

Over the recent years Bulgarian households have accumulated significant savings, and the large part is being kept in bank deposits that can generate decent returns. Until the end of 2012 no taxes were paid on those returns, unlike the returns on a lot of other assets. This difference in tax treatment clearly encouraged one form of saving and discouraged others. It was one of the reasons for the introduction of a tax on interest income in 2013. The more widely advertised reason at the time was that it would stimulate households to increase their

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consumption and reduce their saving due to the reduced returns on bank deposits. This would have been helpful at a time when the Bulgarian economy was struggling to generate growth after the 2009 recession. The obvious third reason was the opportunity to increase the government's budget revenues. The question that this article attempts to answer is how much of that has worked. It further attempts to explores the more general link between rates of return and household saving.

On the surface the data shows that households have continued to add large amounts to their deposits every year since the tax was introduced; banks created new products that helped avoid the payment of tax whatsoever (at least before the tax base was expanded to all deposits at the start of 2015); and revenues from this tax are nowhere near the expected amounts. The positive effect from an economic standpoint is that it has helped equalize the tax treatment of different forms of income.

The deeper answer requires an analysis of the sensitivity of household consumption and saving to changes in interest rates. This article explores the matter by viewing the tax as a simple reduction of the return on the deposit and applying cointegration and vector error-correction (VEC) techniques to estimate the effects of changes in interest rates on household saving, both in the long and in the short run. To this end, the real interest rates on household deposits are used as an approximation of the real returns on all other assets held by them. This is justified by the fact that bank deposits have the largest share in households' financial wealth and that deposit data are available for the entire 15-year period. The focus is therefore not on the one-off effect of the introduction of the tax, but rather on the more general issue of how households' choices between present and future consumption depend on the size of the reward for their patience, with the tax change being only a background reason for this study. The article does not argue for any changes to the tax, but merely makes an assessment of its economic effects.

2. Literature overview

Neoclassical economics views the decisions of rational consumers as to whether to consume or to save their income as an attempt to maximize their lifetime utility. The model that is traditionally employed for the study of these decisions was developed in the early twentieth century by Fisher (1930). It was later used by Friedman (1957) and Modigliani (1954) to develop their respective theories of consumption.

The choice that consumers face can be described using a simple two-period model, in which the income (Y), the price level (p) and the interest rate (i) for the two periods are known. If the individual decides to consume all of their income in the first period, then consumption C_1 is equal to $Y_1 + Y_2/(1 + i)$ and $C_2 = 0$, and if all income is consumed in the second period, then C_2 is equal to $Y_1(1 + i) + Y_2$ and $C_1 = 0$. Any other combination of C_1 and C_2 is also possible. The consumer then attempts to maximize the total utility from consumption in the two periods $U(C_1, C_2)$, according to their time preference.

Contemporary studies incorporate the rational expectations hypothesis in that framework in the manner proposed by Hall (1978). When it comes to the effects of interest rates on consumption and saving, the findings of these studies are somewhat inconclusive. Many authors estimate the impact of interest rate changes on consumption and saving to be zero or very close to zero and often statistically insignificant.[1] In most cases saving rises when interest rates are higher, but the effect is still weak.

[1] See for example Hall (1988), Campbell & Mankiw (1989), Bosworth (1993), Loayza, et al. (2000), Beznoska & Ochmann (2010).

Explaining these empirical results is not made any easier by the theoretical ambiguity of the matter. The abovementioned consumer choice framework postulates that the total effect of an interest rate change on the individual's decision to consume or to save is the sum of three separate effects – substitution effect, income effect, and wealth effect. Their opposing signs make it difficult to predict the size and the sign of the total effect. The substitution effect is usually considered the most important of the three and predicts a shift towards the relatively 'cheaper' future consumption (i.e. an increase of saving) when interest rates rise. According to the income effect, an increase in interest rates lowers the present value of future consumption, which means that it becomes easier to buy a unit of future consumption with today's money, and therefore lowers saving. Similarly, the wealth effect involves a change in the present value of another future variable – the individual's lifetime income. A higher interest rate would lower the present value of this lifetime income (or wealth) and lead to more saving and less consumption.

Adding the three effects together could yield either a positive or a negative result, depending on their individual sizes. To complicate things even further, they appear to depend on such characteristics of the economy like demographic structure, individual preferences, financial system, etc. (Elmendorf, 1996).

There is, however, another empirical regularity that could lead us to a different explanation of the weak reaction of household saving to interest rates. It seems that this reaction is weaker in economies with comparatively lower incomes and/or less developed financial systems. Insufficient income makes it difficult, and sometimes even impossible, to save. So the lower the level of income of households, the less they will 'care' about changes in interest rates (Ogaki, et al., 1996). Likewise, when financial markets are less developed (which is often the case in poorer countries) households will have limited capabilities to borrow against future income, they will have fewer saving opportunities and less trust in the financial system, all of which can lead to a weaker link between rates of return and saving.

A less common explanation suggests that some households may actually increase their saving when interest rates fall, particularly if they are saving with a certain target level of wealth in mind (for example, money needed for a down payment on a house).[2] In such cases lower rates of return make it more difficult to reach that level and they induce more saving. While this may be a less likely scenario, it still adds to the overall theoretical difficulties in explaining the relationship between interest rates and saving.

3. Interest rate and saving dynamics

The period between 2000 and 2014 saw some interesting developments in the Bulgarian economy. Until 2008 gross domestic product was growing at an average annual rate of over 5 per cent, household credit was booming, rising by 37.2 per cent annually, and inflation was relatively high at an average of 7.2 per cent. Real household income also grew at a fast pace, catching up and surpassing the 1989 pre-transformation level. Meanwhile, the nominal interest rates on deposits were comparatively high, but the high inflation rate meant that real rates were negative throughout the whole sub-period (Figure 1). This fact, together with the high income growth rates, falling unemployment,

[2] See, for example Nabar (2011).

[3] The deposit interest rate used here is a weighted average of the annual effective interest rates on all types of bank deposits of households. The saving rate is estimated from NSI Household Budget Studies.

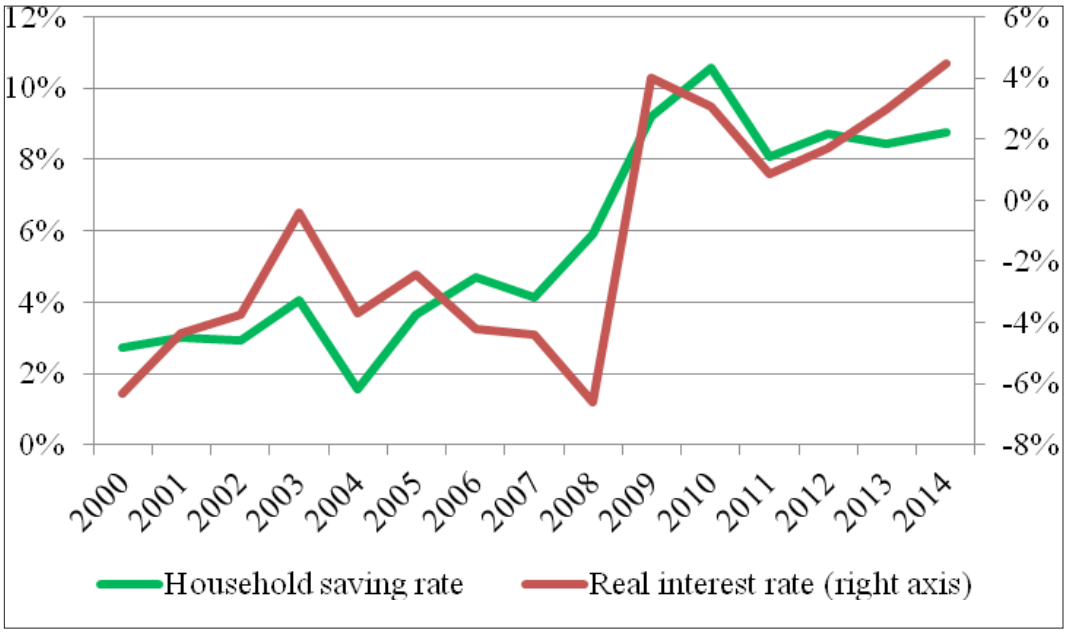

Fig. 1. Household saving rate and real interest rate on bank deposits, 2000 – 2014
Source: Author's calculations, based on data from the National Statistics Institute and the Bulgarian National Bank [Accessed 25.01.2016].

Table 1. Bank deposits of households, 2000 – 2015

	Total amount of deposits (BGN mln.)	Nominal change, compared to prev. year (BGN mln.)	Real growth rate of deposits (%)
2000	3 659	.	.
2001	5 124	1 465	33.6
2002	5 780	656	8.7
2003	6 825	1 045	11.8
2004	8 753	1 928	23.3
2005	11 303	2 550	21.3
2006	13 922	2 620	15.7
2007	17 986	4 064	14.9
2008	21 004	3 018	8.4
2009	23 636	2 632	11.9
2010	26 662	3 026	7.9
2011	30 119	3 457	9.9
2012	33 432	3 313	6.5
2013	36 408	2 976	10.7
2014	37 537	1 129	4.0
2015	40 474	2 937	8.2

Source: Author's table

and the optimistic expectations among households, kept household saving rates very low until 2008.[3]

The 2009 recession was accompanied by much lower inflation as domestic demand slowed down, which led to a sharp rise in real interest rates. They became positive and in 2014 reached their highest level of 4.5 per cent for the entire period. Credit growth stagnated and averaged 0.1 per cent per year during the period 2009 – 2014. The effects of the crisis on households came in the form of job losses, the subsequent higher unemployment and increased uncertainty about the future. This prompted an increase of saving and the saving rate topped 10 per cent (with a peak value of 10.6 per cent) after not being higher than 5 per cent in the pre-2008 period.

This rise in the saving rate appears to coincide with the rise of the real interest rate, suggesting the positive relationship exists between the two. While this cannot be completely ruled out, a closer look at the data reveals that the saving rate actually starts rising in late 2008, before the rise in interest rates in 2009. Instead, the result can be attributed to the growing pessimism in households' expectations as the global crisis was spreading in 2008, which led to the slow-down in bank borrowing as well. The introduction of the interest income tax in 2013 also seems to have had little impact on the saving rate of households.

We can draw similar conclusions if we look at the dynamics of bank deposits (Table 1). They are the most important class of assets in the financial wealth of households, accounting for about 30 per cent of their financial holdings. Deposits have grown rapidly from just over 3.6 billion BGN in the year 2000 reaching almost 40.5 billion BGN in 2015, which is close to 50 per cent of the economy's annual output. There has been a lot of debate about the causes for the accumulation of low-return (but also low-risk) assets. Among the causes that can be listed here are the historical preference of households for lower-risk assets, the limited access to other saving opportunities, like stock markets, the insufficient knowledge about the costs and benefits of other assets, and other factors.

Although their real growth rate has fallen as the total amount has increased, in nominal terms deposits have been growing steadily by about 3 billion BGN every year since 2005. This has been the case in years with very low negative interest rates (2005 – 2008) as well as in years with much higher interest rates, like the period 2009 – 2015. The introduction of the interest tax in 2013 also does not appear to have altered this process. The only exception is 2014, but this can be considered a one-off event, caused by the failure of the fourth largest bank in the country. All of this points to a very limited effect of interest rates (and rates of return in general) on household saving.

4. Econometric estimation

The relationship between interest rates and household saving is also tested econometrically. By applying cointegration and vector error-correction techniques we are able to estimate both the short- and long-run relationships between the variables. There are some specific requirements with regard to the characteristics of the data that is used, but proper testing beforehand should ensure the models yield accurate results.

The Johansen (1988) method is used to estimate the following model:

$$SR = f(DI; W; R; CONF; FOOD)$$

In this equation, *SR* is the household saving rate, estimated from the Household Budget Surveys (HBS), compiled by the NSI; *DI* is real household disposable income, also estimated from the HBS; *W* is the ratio

between the total wealth of households from the Financial National Accounts and the disposable income of households; *R* is the real interest rate on bank deposits; *CONF* is the consumer confidence indicator from NSI Consumer Surveys and represents household expectations. *FOOD* is the share of food expenditures in total household expenditures and is used as an indicator of the effects of low incomes on households' abilities to save. The higher the value of this last variable, the more difficult it would be for households to meet even their basic needs with their income and the more difficult they would find it to save.

Quarterly data relevant for the period between 2000 and 2014 are used. Nominal variables are converted to 2010 constant prices, using appropriate price indices, and seasonally adjusted. All variables are in logarithmic form. The Johansen cointegration approach requires that all variables in the model are integrated of the same order. The augmented Dickey-Fuller test is used to determine the order of integration of the variables and the results are presented in Table 2. They show that all variables are non-stationary in levels and stationary in first differences. In other words, all variables are integrated of order 1 (*I(1)*). This in turn means that the selected Johansen method is appropriate for the estimation.

Two VAR models are constructed, in which the cointegration test will be carried out. The lag order for each of the three models is determined using the standard information criteria and is shown in the header row of Table 3. Both models successfully pass the standard residual diagnostics tests for autocorrelation, normality and homoskedasticity. The Johansen test proves the existence of at least one cointegration equation in both models, which indicates that there is a long-run equilibrium relationship between the variables. The resulting cointegration equations with the estimated long-run elasticity coefficients are shown in Table 3.

Column 1 shows the results from the main model, which does not include the share of food expenditures as a regressor. The results expose the weak connection between the interest rate and the saving rate in the long run, which is broadly in line with the results of other studies. The more interesting result is the negative sign of the estimated coefficient, which means that as interest rates rise the saving rates fall. This can be interpreted as an indication for the existence of target

Table 2. Augmented Dickey-Fuller test results

Variable	Levels	First differences
SR	-2,220649 (4)	-8,039602 (3)***
DI	-2,476044 (0)	-7,029859 (1)***
W	-1,967032 (1)	-2,176842 (0)**
R	-2,900128 (1)	-5,112190 (0)***
CONF	-2,374336 (0)	-8,738492 (0)***
FOOD	-3,310912 (0)*	-9,913668 (0)***

*Notes: The numbers in parentheses show the lag length, determined by the Schwarz criterion. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.*

Table 3. Cointegration equations for the household saving rate

	Model 1 (Lag order: 2)	Model 2 (Lag order: 4)
DI	0,1217 (0,0362)***	0,1430 (0,0081)***
W	-0,0183 (0,0076)**	-0,0311 (0,0033)***
R	-0,1320 (0,0319)***	-0,1552 (0,0280)***
CONF	-0,1133 (0,0120)***	-0,1256 (0,0121)***
FOOD		-0,0455 (0,0162)***
Constant	0,4799	-0,4102

*Notes: The dependent variable in both equations is the household saving rate SR. Standard errors are shown in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.*

Table 4. Vector error-correction models for household saving

	Model 1	Model 2
ECT(-1)	-1.7352 (0.3456)***	-2.9297 (0.4357)***
ΔSR(-1)	0.9430 (0.2848)***	1.7902 (0.3283)***
ΔSR(-2)	0.6343 (0.1872)***	1.6872 (0.3008)***
ΔSR(-3)		0.6615 (0.2385)**
ΔDI(-1)		-0.4781 (0.1005)***
ΔDI(-2)		-0.7098 (0.1496)***
ΔDI(-3)		-1.0175 (0.1942)***
ΔDI(-4)		-0.5866 (0.1106)***
ΔW(-1)	-0.3116 (0.1146)***	-0.4503 (0.0986)***
ΔW(-2)	-0.1373 (0.0928)	
ΔW(-3)		0.2929 (0.1118)**
ΔW(-4)		0.1640 (0.0765)**
ΔR(-1)	0.3468 (0.1367)**	0.5876 (0.1310)***
ΔCONF(-1)	0.0930 (0.0410)**	0.2126 (0.0554)***
ΔCONF(-2)	0.0752 (0.0336)**	0.0905 (0.0303)***
ΔCONF(-4)		-0.1038 (0.0263)***
ΔFOOD(-2)		-0.5465 (0.1220)***
ΔFOOD(-3)		-0.4421 (0.1552)***
ΔFOOD(-4)		-0.4004 (0.1057)***
Constant		0.0179 (0.0033)***
Adj. R^2	0.54	0.67
D-W	2.22	1.77

*Notes: The dependent variable in both equations is ΔSR. Standard errors are shown in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.*

saving among households. If they have a certain target level of wealth (or wealth/income ratio) that they would like to maintain, a fall in interest rates would make that target more difficult to achieve, which would call for more saving and accordingly increase the rate. This conclusion is supported by the negative sign of the coefficient for total wealth, although its effect turns out to be even weaker.

One possible reason for this result is the relatively low level of households' income. In this situation most households are forced to consume their entire income in every period, leaving only a small part aside as a buffer against unfavourable shocks. Maintaining this buffer at the desired level may require an increase of saving when real returns are lower.

Model 2 in Table 3 was estimated to test if income is really at a level that could cause such problems for households. If it is too low, then this would be reflected in a high share of food expenditures in total expenditures and a negative relationship between this share and the saving rate. The result appears to support this. The share of food expenditures is between 35 and 40 per cent of total household expenditures, much higher than other EU economies.[4] The significant negative coefficient means that when incomes rise and people find it easier to meet their essential needs they are also willing to increase their saving. The other coefficients remain relatively unchanged compared to the first model, with the interest rate continuing to have a negative effect on saving.

The short-run coefficients for the interest rate in the VEC equations (shown in Table 4) have the more conventional positive sign, but they are still relatively low. These results explain the lack of any significant effects from the introduction of the interest income tax on the desire of households to save. That also means that the tax is not effective as a policy tool when it comes to altering the consumption and saving decisions of Bulgarian households. The same would also apply to any other tax that affects the rates of return on assets held by households.

5. Conclusion

This article studied the relationship between interest rates and household saving in Bulgaria in light of the recent introduction of an interest income tax. Theoretically, the interest rate is the price of individuals' intertemporal choices, but its effect on saving is ambiguous, because of the opposing substitution, income, and wealth effects. The results suggest that the impact of changes in interest rates on the saving rate in Bulgaria is modest, similar to many other countries. The negative sign of the estimated long-run coefficients is a potential indicator for target saving by households. The main reasons behind it, along with those described by other authors[5], are the low incomes and low amounts of liquid assets owned by most households, together with the relatively low level of development of the banking system (compared to other economies and despite the rapid evolution during the period). This result explains the absence of a significant effect from the introduction of the new tax and implies that policies designed to increase

[4] Estimated from the Household Budget Survey, compiled by the National Statistics Institute.
[5] See for example Atanasov (2005).

consumption through lower interest rates would not be very effective, at least until household incomes have reached sufficiently high levels.

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