

DETERMINANTS OF SAVING IN TRANSITION ECONOMIES (1986-2006)

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Abstract

In recent years it has become a common idea that a high level of saving and investment is a key element of sustained economic growth. For this reason, in this paper we analyze the determinants of saving in the transition economies in Eastern Europe with particular interest on the following: income, inflation, borrowing constraint, dependency ratio and financial liberalization and provide empirical evidence that can be used to identify the areas that need improvement for a sustained economic growth.

Keywords: transition, saving rate, investment, economic growth



*Transylvanian Review
of Administrative Sciences,
23E/2008 pp. 90-99*

I. Introduction:

Economic growth has been a major concern for economists for centuries. For example, Paul Samuelson and William Nordhaus wrote in their well known textbook "Economics": "*Economic growth is the most important factor in the success of nations in the long run*". The predominant model of classical growth belongs to Adam Smith, who argued that saving is what creates investment and hence growth. The neo-classical economics had a slightly different theory of growth, developed by Robert Solow. According to the neo-classical growth model, higher saving leads to faster growth, but only temporarily.

The main aim of this paper is to find the determinants of domestic saving for the transition economies in Eastern Europe. The period covered by this study is between the years 1986-2006. The data source is the World Bank: World Development Indicators.

The countries under consideration are: Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia from Central Eastern Europe, Bulgaria and Romania from South Eastern Europe, and Estonia, Latvia and Lithuania from Baltics.

Even though some Eastern European countries like Poland, Czech Republic and Hungary registered an increase in economic growth, most of them were not capable of matching these three leaders and experienced falling or stagnant economic activity in the past decade. One possible reason for this stagnation could be a low level of saving and investment. Investment can be financed by domestic saving and foreign capital. If capital were perfectly mobile, changes in domestic investment would be independent of changes in domestic saving. But, because of the difficult access to international capital markets in Eastern Europe, domestic saving is the most important source of investment for these countries. This is why, knowing the determinants of domestic saving is considered very important by many economists.

II. Changes in saving rates:

The socialist period was characterized by high saving rates for all Eastern European countries.

One explanation for the high saving rate during the socialist era could be the "involuntary" or "forced" saving, caused by the lack of consumer goods.

Once the transition process began, saving rates started to decline from levels around thirty percent of GDP (before transition) to low twenties and even tens, in almost all transition economies of Eastern Europe.

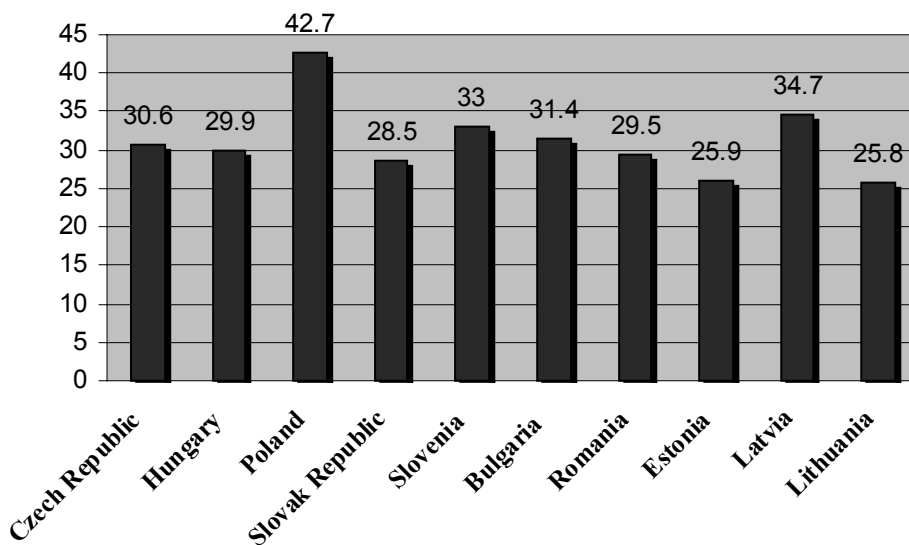


Figure 1: Gross domestic saving rates as a percentage of GDP

Source: World Development Indicators, own calculations

With the beginning of transition process¹ saving rates dropped sharply from levels above thirty percent to less than twenty percent.

This collapse in savings might be explained by the elimination of the involuntary savings. Other reasons for the reduction in saving rates could be: high inflation, high unemployment rate and a reduction in GDP.

Once the economy begun its recovery, in many EU accession countries, saving rates registered a slight increase and remained relatively stable during the recent years.

III. Theoretical determinants of saving and previous findings:

Because understanding the determinants of saving is crucial in designing a number of policy interventions, the analysis of saving behavior has become one of the most important issues in empirical macroeconomics. Many of the empirical studies have used aggregate saving figures while only a few focused on private saving. However, because private saving is the main component of domestic saving, discovering the determinants of private saving is of great importance for economists and policy makers.

Before addressing the theoretical determinants of saving individually, presenting some generalities about the Life-Cycle hypothesis could be very useful because the majority of saving determinants are based on this hypothesis.

¹ Transition began in 1990 in Czech Republic, Hungary, Poland, Slovenia, Slovak Republic; 1991 in Romania and Bulgaria and in 1992 Baltic countries (Latvia, Lithuania, Estonia).

The idea that income varies over people's lives and that saving allows consumers to move income from the period of life when income is high to those times when income is low is the basis of the Life-cycle hypothesis of consumption which was produced by Franco Modigliani and Albert Ando in a series of articles in the 1950s and 1960s. One important reason that income varies over a person's life is retirement. For this reason accumulation for retirement is the principal motive for saving in the Life-Cycle Hypothesis.

If the model is extended to national level, the major saving determinants are income growth and the age structure of the population.

Income

The existing literature not only suggests that income is positively correlated to saving, but also that income plays a key role in explaining saving behavior (Loayza N. et. al, 1999). High income will improve per capita income of households; this will induce them to save more. Thus, richer people can afford to save for their future consumption, but the poor people have low incomes that only allow them to consume at the minimum level.

Growth

Modigliani showed many years ago (Modigliani F., 1966), using Life Cycle hypothesis model, that saving is positively correlated with income growth. He argued that a higher growth rate, would, with unchanged saving rates, rise aggregate saving because it would increase aggregate income of those working relative to those who do not earn labor income.

On the other hand, if workers expect that their income will grow in the future, according to the Life Cycle Model they would want to consume more. This increase in consumption may reduce individual savings by a sufficient amount to offset the effect of higher growth on aggregate saving. This idea was presented by Tobin (Tobin J., 1967) who argued that individual saving rates remain unchanged only in case of myopic expectation of future income.

More recently, Deaton and Paxson (1992) have provided evidence that higher income growth may produce higher saving. Also, Loayza (Loayza et. al, 2000) analyzed this issue once again and concluded that one percent increase in growth rate generates an increase in saving, but the effect may be temporary.

Interest Rate

The effect of interest rates on saving is ambiguous because it depends on the substitution and income effects of interest rate changes. If the substitution effect is higher than the income effect, an increase in interest rate will have a positive effect on savings and vice versa.

Previous empirical literature on developing economies does not clarify the ambiguity of the effect of real interest rates on saving behavior. For example, Ogaki, Ostri and Reinhart (Ogaki, Ostri and Reinhart, 1994) find positive but small interest

rate effects on saving. The same result was obtained by Loayza (Loayza *et. al.*, 1999) who found a weak interest rate elasticity of aggregate and private saving.

Demographics

Life-cycle models indicate that demographic variables affect the saving rate. The empirical studies made by Leff (1969) showed that demographic variables indeed influence the saving behavior, more specifically they found that higher proportion of the young and elderly to those of working age are associated with lower savings rates. As theory suggests, people have the highest saving rate during the peak earning period of their life cycle. How much people save varies significantly among different age groups. In the life-cycle hypothesis younger people have negative saving rates and older people dissave (spend from their saving) because they have only low income during their retirement phase. The vast majority of the empirical studies on the effect of demographics on saving rates used as an explanatory variable the so-called dependency ratio – those under age 15 and over 65 as a share of the total population.

Fiscal Policy

When the government changes its spending on public goods or the level of taxes, it affects the demand for the economy's outputs of goods and services and alters the saving decision. The effect of changes in the supply of public goods on saving behavior depends on the degree of substitutability between private and public goods.

With regard to changes in taxes, an increase in taxation will generate a reduction in private saving and will have an overall negative effect on domestic saving in case the government increases its expenditures by an amount equal to the increase in taxes. A reduction in taxes, will have a positive effect on private saving and an overall negative effect on domestic saving because the increase in private saving is less than the reduction in government saving. But a reduction in taxes may leave the aggregate saving unchanged. This idea was promoted by David Ricardo and it is known as the Ricardian equivalence. According to Ricardian view, the forward-looking consumers understand that a reduction in taxes today means an increase in taxes in the future so they will save more now, leaving the aggregate saving unchanged.

Schroten and Stephan (Schrooten, M., Stephan, S, 2001) pointed out that in transition economies it is necessary to distinguish between “official taxation” and “unofficial taxation” (anything that benefits the government and imposes a cost on private sector without showing up on the budget). The unofficial taxation occurred at the beginning of the transition process increasing the overall tax burden to be paid by private sector.

Borrowing Constraint

The life cycle hypothesis argues that young and old people will dissave to level out their consumption over their life time. But, for young people the tendency to dissave depends on the ability to borrow. If there is a borrowing constraint young people

would like to increase consumption but, there is no way to do so. This may cause an increase in savings over a life time. But, previous findings like Loayza (Loayza,et. all 1999) show a negative impact of the borrowing constraint on saving.

Inflation

The empirical studies on the effect of inflation on the saving behavior have ambiguous results. The Mundell-Tobin effect suggests that inflation could lower the real interest rate permanently and cause a portfolio adjustment from real money balances towards real capital.² This means that higher inflation would be expected to lead to increased saving and investment. However, higher inflation may also lower saving through increased uncertainty (Ipumbu and Kadhikwa, 1999).

Financial Liberalization

Financial reforms in the previously socialist countries included in this paper have consisted mainly of the removal of administrative controls on interest rates, fewer credit constraints, increased saving opportunities, a larger portfolio of investment instruments, a larger number and diversity of financial institutions and a development of securities markets. Early literature on financial reform pointed out the possibility that a higher interest rate would boost savings. But, it is not clear that financial liberalization will actually increase saving because the effect of higher interest rate on savings is itself ambiguous (in case income effect is higher than the substitution effect an increase in interest rate will have a negative effect on savings).

Besides the increase in interest rate, financial liberalization has other characteristics such as larger supply of consumer credit or housing finance that may cause a reduction in saving (Japelli and Pagano, 1994).

The difficult part in determining the effect of financial liberalization on saving behavior is finding ways to measure it. The easiest way to control for financial liberalization is to include in the saving model dummy variables that distinguish between pre and post liberalization periods.

IV. The model for estimation:

An econometric analysis is necessary to examine the determinants of domestic saving in the sampled countries.

Because we are using a panel data set that combines time series with cross sectional data, the model for estimation can be written as follows:

$$y_{it} = \beta_{1it} + \sum_2^k \beta_{kit} x_{kit} + e_{it}$$

Where: $\overline{i=1,N}$ refers to a given country; $\overline{t=1,T}$ refers to a given year.

y_{it} is the dependent variable for country i at time t , and x_{kit} is the k th explanatory variable for country i at time t .

² This point was independently made by Tobin (1965) and has come to be known as “Mundell-Tobin” effect.

Because the study includes ten countries and period of 17 years we will have 170 observations (the number of countries multiplied by the number of years).

The dependent variable is the ratio of gross domestic saving to gross domestic product (GDP).

As independent variable we will include:

- annual growth rate of real GDP as a proxy for income
- Real GDP per capita used to measure the level of income
- inflation rate measured as annual growth rates of the CPI
- real interest rate
- dependency ratio – i.e., the ratio of people under 15 and over 65 to the total population
- Current Account balance as a percentage of GDP as a proxy for the international borrowing constraint of an economy
- Reform. (We will analyze the effect of the transition process on saving rate by including a dummy variable equal to one before the transition process began and one once the transition started).

V. Methodology for estimating the model and the results:

Methodology:

For every year between 1986 and 2006 we are going to create separate data sets. This data sets will be merged together to create a panel data set. Using the panel data set we are going to estimate a fixed effect model (which assumes that there may be a correlation between the error term and the independent variables in contrast with the random effects model which assumes that there is no such correlation).

Results:

The results are included in Table 2 – model 1.

The variables are: gds – gross domestic saving rate; r – real interest rate; gdpg – growth rate of real GDP; gdpc – GDP per capita; cpi – inflation measured as annual growth rate of CPI; p0_15 – the share of people under 15 to the total population; p65 – the share of people over 65 to the total population; tran – dummy variable that captures the effect of transition process; ca – current account balance as percentage of GDP.

As the theory predicts, both the growth rate of real GDP used as a proxy for income and the GDP per capita used as a proxy for income level have a positive effect on saving rate. Even though the sign of demographic variables is as we expected the results show that neither one of the demographic variable is significant.

Also, surprisingly the effect of real interest rate is not significant. One explanation could be the poor quality of data for our sampled countries. The poor quality of economic data available for these countries is one justification for the fact that most of the empirical literature focuses mostly on industrialized countries neglecting the analysis of transition economies. The results also show that transition process and inflation have no significant effect on interest rate.

In our estimation we used the current account balance as a proxy for international borrowing constraint. A current account deficit suggests that a country has to borrow from abroad. In case domestic saving and international capital are perfect substitutes, an increase in this deficit will have a negative effect on saving. But, our results do not support this estimation. This means that domestic saving and foreign capital do not operate as substitutes.

Because we assume that there may be a strong correlation between the explanatory variables we will compute the correlation matrix.

Table 1 (own calculations)

| | gdpg | gdpc | r | cpi | ca |
|------|-------|-------|-------|-------|-------|
| gdpg | 1.00 | 0.20 | 0.58 | -0.47 | -0.35 |
| gdpc | 0.20 | 1.00 | 0.21 | -0.24 | 0.13 |
| r | 0.58 | 0.21 | 1.00 | -0.86 | -0.25 |
| cpi | -0.47 | -0.24 | -0.86 | 1.00 | 0.34 |
| ca | -0.35 | 0.13 | -0.25 | 0.34 | 1.00 |

As we can see from the correlation matrix, we only need to concern for the correlation between the CPI and real interest rate.

Because of the high correlation between these two variables we decided to estimate our model without the real interest rate. This decision was made because the number of observations for the real interest rate is much smaller than the number of observation for the CPI.

The results of our estimation are included in Table 2 – model 2.

This time our estimation shows that the GDP growth has no significant effect on the saving rate.

The GDP per capita is still significant and has a positive effect on the sang rate. The biggest difference is that, this time the demographic variables are significant. More specifically the share in total population of people under 14 and over 65 has a negative effect on saving rate. This result shows that our sampled countries behave in the expected manner. The reason is that both young and old consume more than they can earn, so an increase in this population will drive the saving rate down.

Table 2 (own calculations)

Model 1 – Dependent variable: gross domestic saving rate

| Model | Coefficient | t-Statistic |
|----------------------|-------------|-------------|
| Growth | 0.23 | (2.59) |
| GDP per capita | 0.003 | (3.25) |
| Current Account | 0.47 | (5.09) |
| Population under 14 | -0.45 | (-0.76) |
| Population over 65 | -1.98 | (-1.98) |
| Real interest rate | -0.07 | (-1.38) |
| Consumer Price Index | -0.006 | (-1.03) |
| Transition process | -4.69 | (-1.52) |
| R^2 | 0.68 | |

Model 2 – Dependent variable: gross domestic saving rate

| Model | Coefficient | t-Statistic |
|----------------------|-------------|-------------|
| Growth | -0.03 | (-0.39) |
| GDP per capita | 0.004 | (4.54) |
| Current Account | 0.45 | (3.86) |
| Population under 14 | -1.33 | (-2.07) |
| Population over 65 | -5.34 | (-4.46) |
| Real interest rate | - | - |
| Consumer Price Index | -0.0005 | (-0.15) |
| Transition process | -2.54 | (-1.10) |
| R^2 | 0.78 | |

VI. Conclusion:

Because understanding the determinants of saving is crucial in designing a number of policy interventions, the analysis of saving behavior has become one of the most important issues in empirical macroeconomics.

This paper is a step forward in trying to find some information regarding the determinants of saving in transition economies in Eastern Europe. Our results show that the most important factor behind the saving is income. The role of real interest rate is not significant. Also, the coefficient for the current account balance shows that domestic saving and international capital do not operate as substitutes, which is understandable considering the limited access for these countries to international capital markets. Additionally, the transition process had a negligible effect on the saving rate.

Even though more exact studies can be conducted, these results can offer an idea about the areas that needs improvement for a sustained economic growth.

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