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## BRIEF EMPIRICS OF INTEREST - RATE DIFFERENTIAL IN MACEDONIA

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### Abstract

*The aim of this paper is to empirically test the order of integration of the differential of the referent interest rates in Macedonia and Euro zone, in order to confirm or reject the hypothesis of interest-rate convergence in Macedonia. Namely, the strategy of exchange-rate pegging puts monetary policy on an autopilot which immediately shrinks domestic inflation at Euro zone's level, but is expected to lead to interest-rates convergence too. We utilize three less-known tests in the literature of series' integration: KPSS, Geweke and Porter-Hudak test and Robinson test and we find support for the hypothesis that interest rates are in a process of catching up, which implies that their integration level is about 0.87, hence confirming that the convergence is not yet achieved, but is underway.*

*Keywords: interest-rate convergence, tests for fractional integration*

*JEL classification: E43, E50*

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### Introduction

The process of economic convergence is essential for any country that opts to join the European Union. Two aspects of economic convergence are important: nominal and real. The nominal convergence implies harmonization of monetary policy, in order to curb inflation and its volatility, converging interest rates, stable exchange-rate anchor and prudent fiscal policy. What follows then is the real convergence which, generally said, implies elimination of the disparities in the living standards. Whereas the real convergence is longer-term concept, the nominal convergence is usually achieved by anchoring the domestic currency. Macedonia anchored its currency to the Euro and formerly to the Deutsche mark in 1995. As an EU candidate country, it will have to fulfill the Maastricht criteria for entering the Euro zone (i.e. the criteria for nominal economic convergence), and, for this purpose, the peg needs to be the biggest contributor. An aspect of the nominal economic convergence is the convergence of nominal interest rates.

The objective of this paper is to test the level of convergence between the referent interest rate in Macedonia - the rate on the open market operations and the referent interest rate in the Euro zone - the rate on the main refinancing operations. This is implied by the basic interest-rate parity conditions, according to which, when the exchange rate is held fixed, the domestic interest rate must equal the foreign rate. Although it might be far from reality, mainly because of the risk premium implied by the country risk, still the hypothesis is empirically testable. In essence, the risk premium might be the factor that will prevent immediate equalization of both interest rates, but as monetary policy accrues the credibility of the anchor central bank, the interest rate is expected to converge. The speed of convergence depends on the central-bank's commitment towards maintaining the peg, but also on other factors out of its control, mainly in the vein of the fiscal-policy behavior and some political developments. This study opts to analyze the interest-rate differential through the prism of some newly established econometric tests.

For the purpose stated, the study is organized as follows. The next section offers a brief theoretical overview of the theory underlying our investigation. Section three describes the data and section four explicates the methodology. Section five presents the results and offers some discussion. The last section concludes.

### **Theoretical overview**

The theoretic background of the analysis in this paper is the interest-rate parity condition, which states that the domestic interest rate equals the foreign interest rate plus the rate of depreciation of the domestic currency. When there is perfect currency substitution (Pigott, 1994) or when the domestic currency is fixed vis-a-vis the foreign currency (Obstfeld and Rogoff, 1995), the rate of depreciation equals zero and hence the domestic must equal the foreign interest rate. In other words, when authorities embark on pegged exchange rate, they completely subordinate the domestic monetary policy to the one of the anchor economy, i.e. impose the foreign inflation into the domestic monetary environment. Moreover, the interest parity condition states that not only domestic inflation will equal the foreign inflation, but the same refers to the interest rates (for additional reading, refer to any macroeconomic textbook, like Krugman and Obstfeld, 2007; Abel and Bernanke, 2008; Mishkin, 2008).

In reality however, the equalization of the interest rates does not occur immediately. Although the pressure to converge (should) exists, still the time to converge might be substantial. Differential mainly arises because of investors' perceptions to invest their money into the economy, i.e. the differential measures the uncertainty that the economy faces and is hence known as the risk premium. In turn, uncertainty might arise because of the economic policies (high budget balance, worsening of current account, leaking of official reserves and so on) or because of political tensions (domestic and regional). The fixed exchange rate puts pressure on economic policies and hence ensures monetary and hence, interest-rate convergence. From that viewpoint, Camarero et al. (2002) defines three states: absence of convergence; long-run convergence and catching-up process.

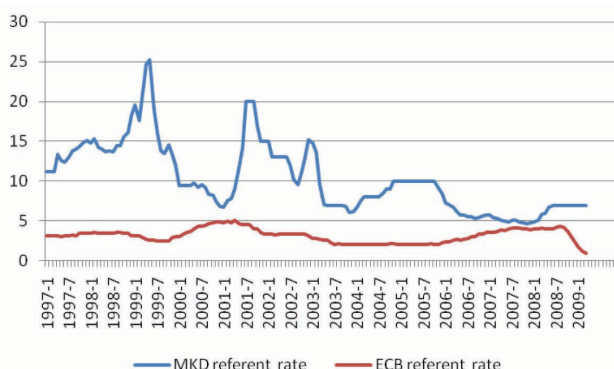
### **Data**

We analyze monthly data over the period 1997:01-2009:03, hence obtaining 147 observations. This period is chosen because of data availability in Macedonia. For Macedonia, we use the interest rate on the open-market operations of NBRM after 2000 and the discount-window interest rate of NBRM before 2000, because those played the role of referent rates in the respective periods. For the Euro zone, we use the interest rate on the main refinancing operations of ECB after 2001 and the overnight money-market interest rate of Deutsche Bundesbank before 2001. Once specified, we econometrically analyze the interest-rate differential.

The movements of both interest rates are presented on the following graph. The movements of the Euro zone interest rate is relatively stable; the last period observes a decline of the interest rate (up to 1% in May

2009), to combat the global financial crisis and to help the real economy. However, the crisis is out of the focus of this study. Macedonian interest rate exhibits considerable volatility. At an outset, two peaks are notable: the one in the first half of 1999, because of Kosovo crisis, and the other in mid-2001, because of the domestic military crisis. Both events are of political nature and suggest that advanced modeling of interest rates must consider those shocks. In the last period, the interest rate in Macedonia, contrary to the one in the Euro zone, exhibits an increase, mainly because of the pressures on the foreign exchange market and hence, the pressures to maintain the peg. However, the trend of Macedonian interest rate is downward sloping and, in very general terms, might imply that interest rates are converging.

**Figure 1.**  
*Referent interest rate in Macedonia and the Euro zone*



### Methodology and tests

The empirical part of this paper uses stochastic definitions of convergence and follows the work of Bernard and Durlauf (1995), according to which, there is a long-run economic convergence between two countries  $i$  and  $j$ , if the respective long-run forecasts for the respective variable in those countries are equal at time  $t$ :

$$\lim_{k \rightarrow 0} E(r_{i,t+k} - r_{j,t+k} | I_t) = 0 \quad (1)$$

whereby  $I_t$  refers to information available at time  $t$ . This equation will stand if  $r_{i,t+k} - r_{j,t+k}$  is a stationary process, i.e. both countries will converge in terms of the variable with a cointegrating vector  $[1, -1]$ . Moreover, if both variables are stationary in terms of their trend, the definition will result in the same time trend for each country (Camarero et al. 2002).

Bernard and Durlauf (1995) and Camarero et al. (2002) suggest differentiating two types/degrees of convergence: long-run convergence and catching-up process. The latter usually refers to the new member-states of the EU or, in general, to peripheral countries of a monetary integration, which want to converge their economy (foremost in nominal terms) with the economy of their largest trading partner. The catching-up process means that the gap between interest rates narrows as the time passes, but the ultimate, sustainable in the long run, convergence has not been achieved yet.

An easy way to test for convergence is to test the integrative characteristics of interest-rate differential, i.e. examining it for containing unit roots. Rejecting the hypothesis that a unit root exists (i.e. stochastic and deterministic trend exist) implies existence of a long-run convergence (level stationarity); if a deterministic

trend exists only, the country is in a process of nominal convergence, the so-called catching-up process (trend stationarity). At this place, using the standard unit root tests (Augmented-Dickey Fuller, Phillip-Perron) is inappropriate, because by rejecting the null of unit root, a difference cannot be suggested if stationarity is a level or a trend stationarity. Also, by not rejecting the null of non-stationarity, a significant mistake can be made to conclude no convergence, when, in essence, interest rates are in a process of catching up. Moreover, in case when series are neither  $I(0)$  nor  $I(1)$ , but something in-between, these tests are increasingly weak. Econometric literature, however, developed appropriate solutions for situations like this. Kwiatkowski, Phillips, Schmidt, and Shin (KPSS, 1992) developed a test for stationarity of a time series. This test differs from the common tests by having a null hypothesis of stationarity. Moreover, the test may be conducted under the null of either trend stationarity or level stationarity. Inference from this test is complementary to that derived from those based on the Dickey-Fuller distribution (see, for instance, Lee and Schmidt, 1996). The estimate of the long-run variance of the time series may be calculated using either the Bartlett kernel or the quadratic spectral kernel. Andrews (1991) and Newey and West (1994) indicate that the latter kernel yields more accurate estimates of sigma-squared than other kernels in finite samples (Hobijn et al. 1998), but at this place we will present the results of both options.

In addition to KPSS, two tests were developed to test the long memory of the time series, i.e. to test the order of the fractional integration (between  $I(0)$  and  $I(1)$ ). Geweke and Porter-Hudak (1983) developed an estimate of the long memory (fractional integration) parameter,  $d$ , of a time series. Moreover, Robinson (1995) suggested a multivariate semi-parametric estimate of the long memory (fractional integration) parameters,  $d(g)$ , of a set of time series. If a series exhibits long memory, it is neither stationary ( $I(0)$ ) nor it is a unit root ( $I(1)$ ) process; it is an  $I(d)$  process, with  $d$  being a real number. When applied to a set of time series, the  $d(g)$  parameter for each series is estimated from a single log-periodogram regression, which allows the intercept and slope to differ for each series. The standard errors for the estimated parameters are derived from a pooled estimate of the variance in the multivariate case, so that their interval estimates differ from those of their univariate counterparts. In the next section, we apply those three tests on the interest-rate differential.

## Results and discussion

At first, we look at the conventional tests of integration: Augmented Dickey Fuller (ADF), Phillip Perron (PP) and Augmented Dickey Fuller-GLS test (DFGLS).

**Table 1. Conventional unit root tests**

	ADF		PP		DFGLS	
	mean	trend	mean	trend	mean	trend
t-stat	-1.884	-3.336*	-2.142	-2.941	-2.361**	-2.934*

Ho: series is non-stationary

\*\*\*, \*\* and \* indicate rejecting the null at 1%, 5% and 10%, respectively.

As expected, ADF and PP cannot reject the null hypothesis of unit root, whenever a trend is included or not. Dickey-Fuller GLS behaves somehow differently and strangely, suggesting that the null can be rejected at conventional levels, but accepting the alternative in both cases suggests that interest-rate differential is mean- and trend-stationary. Again, this difference is blurred and might further suggest test's weakness. To overcome those weaknesses, we use more advanced tests, as specified in the methodological section.

The next two tables present the results from the KPSS test (and for its different options):

**Table 2.** *KPSS unit root test: lags chosen by Schwert criterion*

Auto-covariances weighted by Bartlett kernel				Auto-covariances weighted by Quadratic Spectral kernel			
Ho: series is level stationary		Ho: series is trend stationary		Ho: series is level stationary		Ho: series is trend stationary	
Lag order	t-stat	Lag order	t-stat	Lag order	t-stat	Lag order	t-stat
0	7***	0	0.245***	0	7***	0	0.245***
1	3.57***	1	0.128*	1	5.54***	1	0.196**
2	2.44***	2	0.0898	2	2.74***	2	0.0993
3	1.88***	3	0.0713	3	1.88***	3	0.0704
4	1.55***	4	0.0604	4	1.46***	4	0.0565
5	1.33***	5	0.0534	5	1.21***	5	0.0485
6	1.17***	6	0.0486	6	1.04***	6	0.0433
7	1.05***	7	0.0452	7	0.922***	7	0.0399
8	0.962***	8	0.0429	8	0.834***	8	0.0377
9	0.891***	9	0.0412	9	0.767***	9	0.0362
10	0.833***	10	0.0402	10	0.714**	10	0.0353
11	0.786***	11	0.0395	11	0.671**	11	0.0349
12	0.747***	12	0.0392	12	0.636**	12	0.0349
13	0.714**	13	0.0393	13	0.607**	13	0.0353

\*\*\*, \*\* and \* indicate rejecting the null at 1%, 5% and 10%, respectively.

**Table 3.** *KPSS unit root test: automatic bandwidth selection*

Ho: series is level stationary		Ho: series is trend stationary	
Lag order chosen	t-stat	Lag order chosen	t-stat
3	1.88***	3	.0704

\*\*\*, \*\* and \* indicate rejecting the null at 1%, 5% and 10%, respectively.

Both tables suggest that the interest rate differential is not level-stationary. This was confirmed by the conventional stationarity tests in table 1. Namely, columns with H0 implying level-stationarity in tables 2 and 3 suggest that the null can be rejected at 1%, for any lag selection, even when the lag-selection is automatic. On the contrary, columns with H0 implying trend-stationarity suggest that only for lag selection of 0 and 1, the null of trend stationarity can be rejected, but not for all other lags. Moreover, the automatic bandwidth selection suggests lag length of three, which does not reject the null of trend stationarity. These results suggest that indeed the interest-rate differential is not level stationary, but instead is trend stationary. They suggest that the order of integration of the interest-rate differential is fractional, i.e. is between  $I(0)$  and  $I(1)$ . More intuitively, they suggest that interest rates in Macedonia have not converged with those of the Euro zone yet, but rather are in a process of convergence (catching up). If we have judged according to the conventional unit root tests, we wouldn't have been able to discover this catching up.

To discover the order of integration, we perform the two additional tests as specified in the methodological section. In this specifications, we exclude the period 2008:03-2009:03, as this is the time when the global financial turmoil pressed interest rates in Macedonia upwards, hence creating a structural break in the dif-

ferential. We do this, in order to obtain a value for the order of integration which will be applicable for a major part of the observed period. Results follow:

**Table 4.** *Geweke and Porter-Hudak and Robinson test*

Geweke and Porter-Hudak test			Robinson test		
Test's power	d	t-stat	Test's power	d	t-stat
0.5	.870449	3.5429***	0.5	.8675571	3.5525***

\*\*\*, \*\* and \* indicate rejecting the null at 1%, 5% and 10%, respectively.

Table 4 suggests that interest-rate differential is fractionally integrated, with a value of  $d$  of about 0.87, which confirms our suspicion in the conventional unit-root tests. In order words, Geweke-Porter-Hudak and Robinson tests confirm the results of the KPSS test for fractional integration and the trend stationarity (i.e. the catching-up process) of the interest-rate differential.

## Conclusion

The objective of this paper was to test the level of convergence between the referent interest rate in Macedonia - the rate on the open market operations and the referent interest rate in the Euro zone - the rate on the main refinancing operations. We used more advanced unit root tests to check the order of integration of the interest-rate differential in Macedonia in order to suggest if Macedonian interest rate converges towards that of the Euro zone. The KPSS test suggested that Macedonian interest rate is in a process of catching up, while Geweke-Porter-Hudak and Robinson tests suggested a fractional integration of about 0.87 ( $I(0.87)$ ), which confirms the results obtained by KPSS.

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## ASSESSING HANDICRAFT SHADOW ECONOMY IN MACEDONIA

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### Abstract

*In every economy more or less are present shadow economy activities. With every change of the legislation for reducing it, shadow economy activities are changing and adapting as well. In this paper we give overview and definitions of the shadow economy, reasons for and effects from it. I employ field research to measure the size of shadow economy in different sectors in the handicraft economy in Macedonia. Also we include calculations from the State Statistical Office for underground (underreporting) and informal sector (not registered) economy from 2000 till 2007.*

*Key words: shadow economy, household expenditure, handicraft economy*

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### Definition of the Shadow Economy

Shadow Economy is present and fact of life in every economy and every economy is trying to control and reduce it. Every attempt to measure, estimate and understand the shadow economy first face the problem of defining it. In general precise definition seems quite difficult, maybe impossible, because "the shadow economy develops all the time according to the principle of running water: it adjust to changes in taxes, to sanctions from the tax authorities and to general moral attitudes, etc" (Mogensen, et al. 1995 p.5)<sup>1</sup>. Many theoretical controversies and political discussions are due to use of different or inadequate definitions<sup>2</sup>.

Most used definitions for the Shadow Economy are following: Smith (1994, p 8) defines it as "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP". Shadow economy can be defined as unregistered, undeclared, and not taxed share of the whole economy<sup>3</sup>.

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1) For a detailed discussion see "Controversy: on the hidden economy" in Economic Journal (Vol. 109, no. 456, June 1999)

2) Here are small selections of terms used either synonymously or in different issue areas, according to the respective author: underground economy, illicit work, informal sector, irregular sector, leisure economy, alternative economy, black economy, hidden economy, unofficial economy, parallel economy, shadow economy, unobserved economy. See amongst others Thomas (1992, p.1225)

3) Development Economic Policy: How to integrate shadow economy, Boris Najman, Paris 3, Paris,

For better understanding what could be a reasonable consensus of legal and illegal underground or shadow economy we will use Table 1. From table 1 it becomes clear that the shadow economy includes legal goods and services either from monetary or barter transactions, hence all economic activities which would generally be taxable if they were reported to the tax authorities.

**Table 1**

	<b>Monetary Transactions</b>		<b>Nonmonetary Transactions</b>	
<b>Illegal Activities</b>	Trade in stolen goods: drug dealing and manufacturing, prostitution, gambling, smuggling, fraud.		Barter: drugs, stolen goods, smuggling, etc. Producing or growing drugs for own use. Theft for own use.	
	<b>Tax Evasion</b>	<b>Tax Avoidance</b>	<b>Tax Evasion</b>	<b>Tax Avoidances</b>
<b>Legal Activities</b>	Unreported income from self-employment; Wages, salaries and assets from unreported work related to legal services and goods.	Employee discounts fringe benefits.	Barter of legal services and goods.	All do-it-yourself work and neighbor help.

Source: Rolf Mirus and Roger S. Smith (1997, p.5), with additional remarks.

In this research definition for the shadow economy we will take from the Public Revenue Office because of the following reasons: there is big variety of definitions for the shadow economy and most of them are not offering complete understanding, our focus in this research is Macedonian shadow economy. Thus, according the Public Revenue Office, Shadow Economy is defined as doing economic activities which are legal but unofficial and undeclared for tax purposes, from individuals, unofficial groups and organizations<sup>4</sup>. According this definition in Macedonia illegal activities such prostitution, drug dealing and manufacturing are not taken as a part of shadow economy. In Macedonia shadow economy is most present in the following sectors: construction, tourism, transport, green markets trade, textile industries, auto services, home maintenance, furniture production, cosmetic and hear style services, painting services, renting, teaching and translation and hardware and software services.

### Reasons for existing the Shadow Economy and its impact on the economy

The existing and growth of the shadow economy is caused by many different factors. The most important and most cited are<sup>5</sup>: the rise of the burden tax and social security contributions; increased regulation in the official economy, especially of labor market; earlier retirement; unemployment and decline of civic virtue and loyalty towards public institutions combined with decline tax morale.

Besides the mentioned factors from above in Easter Europe<sup>6</sup>, as well in Macedonia following factors are also important:

- Lack of competencies and trust in official institution (e.g. court, administration/bureaucracy, legislation);
- The administration is inefficient and corrupt;

4) Definition from the Public Revenue Office in Macedonia

5) For an overall view, see the studies by: Tanzi 1982 and Schneider and Enste (2000)

6) See "The Shadow Economy and Institutional Changes in Transition Countries" Dr. Dominik H. Enste, Institut der deutschen Wirtschaft, Köln

- Property rights cannot be guaranteed by the official institutions and people search for other options;
- Inadequate of laws and regulations;
- High cost and administrative burden for entrepreneurs;
- High taxes in combination with no adequate supply of public goods and infrastructure lead to lower acceptance;
- Sometimes "hidings in the shadows" is essential for surviving and establish business.
- A low probability to be caught as illicit worker or tax evader result in cost-benefit calculation where illicit work is more attractive the regular and official work;
- Broad acceptance of illicit work makes it difficult to fight this phenomenon.

Huge percentage of unemployment in the past 18 years of around 35% in Macedonia is one of the biggest reasons for the big percentage of Shadow Economy. All governments in the past, official or unofficial, were not interested to reduce the size of the Shadow Economy because of the social piece in the country. Very big part from the unemployed were working and earning money in the shadow economy and by that all governments had smaller problems on short term.

In the beginning of the transition and privatization of the economy Macedonian legislation was not prepared to ensure efficient market economy. Big numbers of entrepreneurs benefited from the lack of regulations and laws. After legislation is in place then the implementation was, and still, is a big problem because businessmen preferred to avoid paying taxes and working according defined standards. Huge steps in this area were made in 2000 when was introduced the Value Added Tax, which was one of the biggest reforms of the tax system in Macedonia.

Schneider and Neck (1993)<sup>7</sup> in their theoretical model estimate that a more complex tax system implies, *ceteris paribus*, bigger labor supply in the shadow economy, because more complex tax system makes individual efforts to avoid legislation more profitable. Till last year, 2008, Macedonia has relatively complex labor tax system which was providing easy opportunities for avoiding some parts from the direct taxes. Big numbers of employers in low paid sectors were paying income tax, but no health or pension insurance or opposite. Starting from 1 January 2009 new reform is implemented for gross salary in order to make simpler the tax system and prevent avoidance from paying taxes and contributions. We will try to measure effects on the shadow economy from this reform.

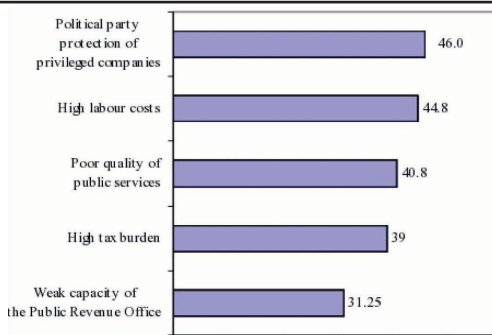
Increased regulation reduces individuals' choices in the official economy<sup>8</sup>. Intensity of regulations is often measured by the number of laws and requirements such as licenses. In the past few years in Macedonia the regulations and standards requirements is increased because of the process for joining in the EU, and fulfilling the EU standards. Some of the companies accept and fulfill these requirements but some companies were not able to implement EU standards, which bring to their closing or moving to work in the shadow economy and also introducing not fair competition to those businesses that implements the legislation and standards requirements.

Relatively high total labor costs and regressive labor tax system are big reason in Macedonia for more people to work in the shadow economy. For a worker who is getting average salary in Macedonia social contribution are 33% and for those who are getting half of the average salaries social contribution is even higher 39%<sup>9</sup>.

7) Shadow Economies: Size, Causes and Consequences, Friedrich Schneider and Dominik H. Enste, Journal of Economic Literature, Vol XXXVIII (March) pp. 77-114

8) See Schneider and Enste (2000) for an integration of this theory in an interdisciplinary (rational choice) approach.

9) Ministry for Finance, Pre-accession economic program 2009-20011

**Chart 1***Implicit weighted-average responses*

Note: 0=irrelevant, 100 high relevant

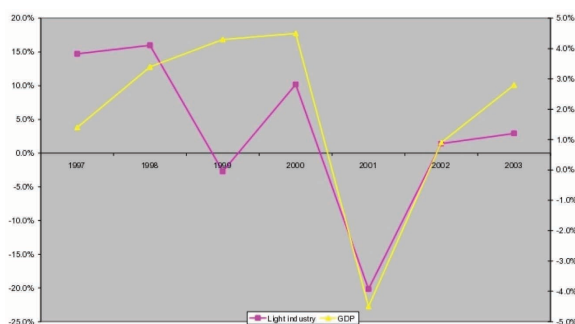
Source: Flat tax policy assessment in Macedonia, CEA, September 2008

According the research done by CEA<sup>10</sup> in 2008 for assessing flat tax policy in Macedonia, main reasons for tax evasion of the companies are following: excessive tax burden, poor quality of public services, weak capacity of the Public Revenue Office, political party protection of privileged companies and high labor costs.

Understanding effects from existing and increasing shadow economy to the official economy is very complicated and difficult and quality comprehensive empirical evidence is not valid. Most of the studies focus on lost revenue from the state budget and allocation of the resources. But is very important to mention that Shadow economy in the developing countries is keeping the social peace and support functioning of the system in the countries<sup>11</sup>.

### Shadow Economy in Macedonia

There is not so much official estimation of the size of shadow economy. One of the serious attempts to estimates shadow economy is made by M. Nikolov<sup>12</sup> using the model of Kaufman, Shleifer and Jonson (1997). Nikolov first estimate the unofficial economy as a percentage of GDP and after he convert this estimates into employment. The method is based on the assumption that electricity consumption is a rough measure of overall economic activity country, and it is usually found that the short-run elasticity of electricity consumption with respect to GDP is close to 1. Officially measured GDP captures only the registered part of the economy, and the difference between the overall and measured GDP gives the size of the unofficial economy. The change in the size of the unofficial economy is the difference between the change in electricity consumption and the change in official GDP.

**Figure 1***Growth of electricity consumption and GDP in Macedonia*

Source: Report on the labor market in Macedonia, 2005, Center for Economic Analyses (CEA)

10) See more: tax policy assessment in Macedonia, CEA, September 2008, page 27.

11) Shadow Economies: Size, Causes and Consequences, Friedrich Schneider and Dominik H. Enste, Journal of Economic Literature, Vol XXXVIII (March) pp. 77-114

12) See more: Report on the labor market in Macedonia, 2005, Center for Economic Analyses (CEA), page 21.

By making the assumption that unofficial economic output (value added) and unofficial employment have the same percentage share in the economy, which is equivalent to assuming that productivity in the official and unofficial sectors are identical, Nikolov calculate that in Macedonia in 2004, there were almost 110,000 people who were employed in the unofficial sector (table 16). This enables us to recalculate the unemployment rate, which is now roughly 20% as compared to the official rate of over 35%.

According to Nikolov, unofficial employment in Macedonia from 1996 till 2004 was between 100,000 and 150,000. Taking into consideration the number of unofficial employed in Macedonia we have a real unemployment rate of around 20%.

**Table 2**

*Unofficial GDP share and unofficial (un)employment in Macedonia.*

	Unofficial GDP as a share of the total GDP	Number of unemployment under the LFS	Unofficial employment	Overall unemployment rate
1996	40.3%	251489	101350	19.0%
1997	45.7%	288213	131624	19.6%
1998	51.4%	284064	146060	16.8%
1999	47.8%	261451	124995	16.9%
2000	50.5%	262711	132747	16.0%
2001	42.6%	263196	112123	17.5%
2002	42.8%	263483	112822	18.3%
2003	42.9%	315900	135438	21.0%
2004	35.3%	309286	109300	24.0%

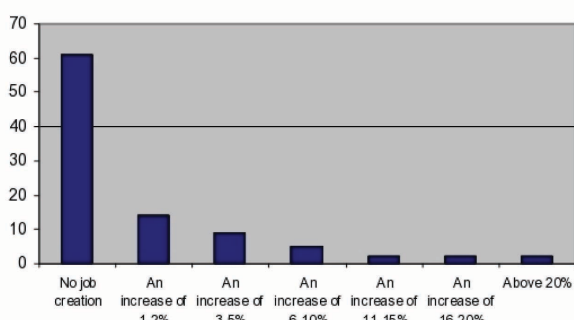
Source: Report on the labor market in Macedonia, 2005, Center for Economic Analyses (CEA)

In 2007 in Macedonia the taxation system was reformed by introducing the so-called flat tax rate. With this reform it was expected the shadow economy to be reduced and also to improve the business environment and to attract FDI.

According to the research made on flat tax policy implementation in Macedonia<sup>13</sup>, done by CEA on September 2008, more than 60 % of the companies didn't increase the number of employees due to the flat tax system. On the other side 32% of the surveyed companies answered that they have increased the number of employees from 1% to 20%.

**Table 3**

*Percentage of companies that increased the number of employees due to flat tax introduction*



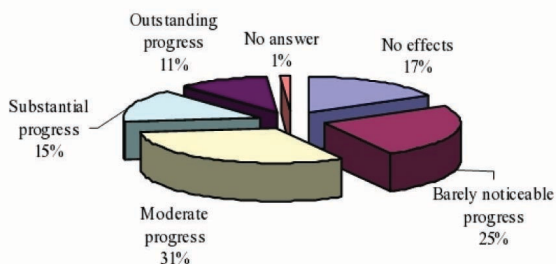
Source: Firm-level survey in Macedonia, 2008.

According to the same research 17 % of the respondents are not expecting any improvements, 25% are skeptical and expect barely noticeable progress, the largest group 31% is expecting moderate progress, whereas 15 % believe there will be outstanding progress in improving the situation with the misreporting of the wages.

13) See more: Flat tax policy assessment in Macedonia, CEA, September 2008, page 14.

**Chart 1**

*Expected progress in improving the reporting of wages due to the simplified and reduced taxes*

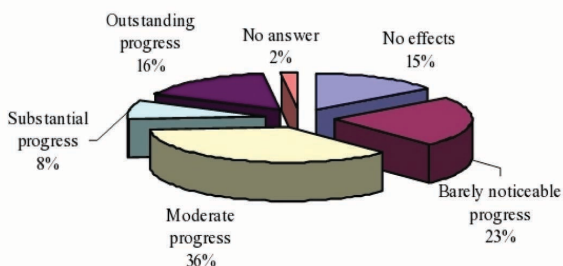


Source: Flat tax policy assessment in Macedonia, CEA, September 2008.

Implementation of flat tax policy motivates the employers to register<sup>14</sup> their employees. As chart 17 illustrate, 36% from surveyed companies think that the flat tax regime will help reporting realistically the exact number of employs, 23% are skeptical and 15% of the respondents have odium toward this issue.

**Chart 2**

*Expected progress in improving the reporting of the number of employees in response to the introduction of the flat tax*



Source: Flat tax policy assessment in Macedonia, CEA, September 2008.

With respect to the expected effects in combating the grey economy and tax evasion<sup>15</sup>, 21% of the respondents do not expect any progress in this area, whereas one third (33%) share the opinion that such tax policy would help a little. Hence, more than a half of the respondents were skeptical that the introduction of flat tax will reduce the incentives for staying outside the formal economy. Still, 15% contend that the flat tax rate would significantly decrease the grey economy and 29% expect moderate progress in combating the shadow economy. Although derived by qualitative assessment, they do offer a tentative picture of the relevance of the grey economy. These results reflect the opinion of the managers of the domestic companies, which constitute 78% of the sample.

### Handicraft shadow economy in Macedonia

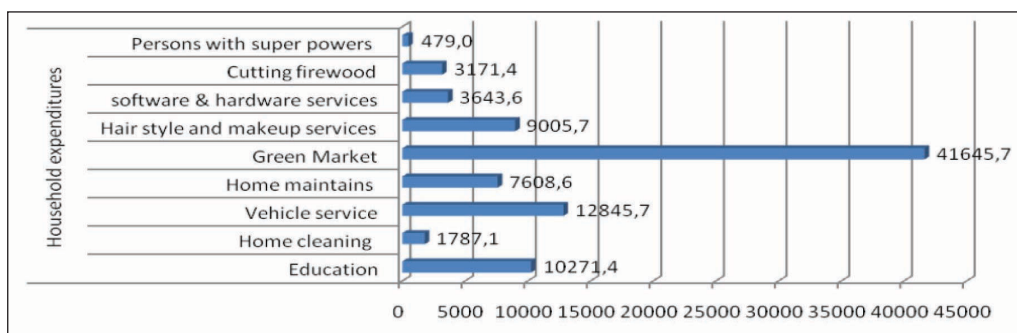
In Macedonia non-registered economy is assessed around 40-50% of the GDP, with our research we were assessing the share of handicraft shadow economy in the country. The research was done in 10 bigger towns in Macedonia and the City of Skopje following the cluster sampling procedure, in February and March 2009 with 85 surveyed households. The amounts presented below are representing the results of this survey for household's expenditures for which they don't get receipt, bill or invoice. With the research following sectors were include: additional education, cleaning services, motor vehicle services, home maintenance, green markets, hair style and make up services, software and hardware services, cutting firewood and fortune tellers.

14) See more: Tax policy assessment in Macedonia, CEA, September 2008, page 20

15) See more: Tax policy assessment in Macedonia, CEA, September 2008

## Chart 2

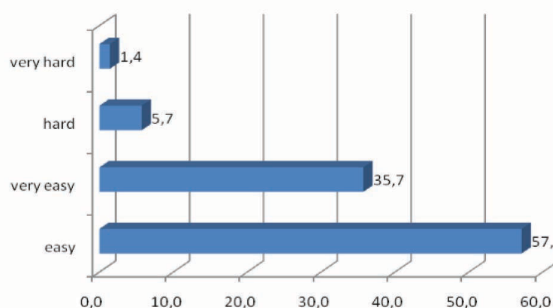
### Household expenditures by handicraft sectors in Macedonia



According our research one family is spending on average 22.8 % from the income in the handicraft economy. From figure 1 we can see average spending for a year from one family in the green markets is 41.645 denars, which is the sector with biggest amount of money, and the lowest amount goes to fortune tellers who are seeing the future, priests etc, 479 denars annual average per family.

## Chart 3

### Do you have acces to products and services from shadow economy

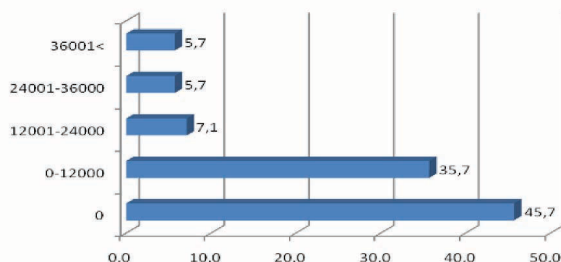


Over 90 % from the surveyed household are having easy or very easy access to products or services from the handicraft economy. This means shadow economy activities are present everywhere around the citizens in Macedonia and is becoming a normal thing. Around 90 % knows what is shadow economy and that is not registered.

Question number 4 was asking how much of the families are spending for additional education, like English language classes, mathematics, preparation for exams and etc. Average amount spent for this services by households in Macedonia is 10.271 denars.

## Chart 4

### Household expenditures for additional education



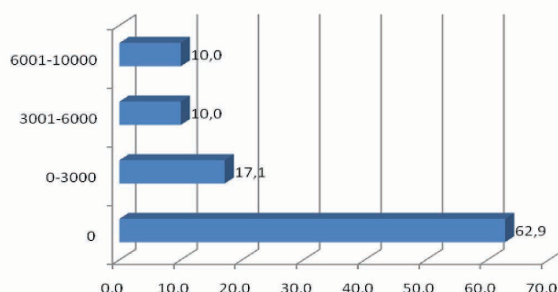


Around 45 % of households are not spending at all for additional education, 35.7 % are spending below 12.000 denars annually, 7.1 % are spending between 12.001 and 24.000 denars annually, and 5.7 % are spending between 24.001 and 36.000 denars and the rest 5.7% spend over 36.000 denars for additional education for one year.

With the fifth question we want to measure how much money households are spending for cleaning their homes. For this services average spending from interviewed households is 1.787 denars.

**Chart 5**

*Household expenditures for cleaning services*

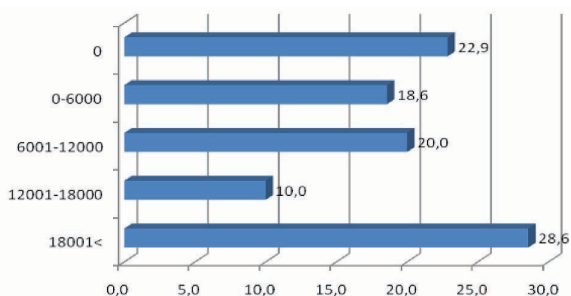


Most of the families, 62,9 % are not paying anyone for cleaning services because they are doing it by them self. Around 17 % are spending less than 3.000 denars for cleaning and by 10 % are spending between 3.001 - 6.000, and 6.000 -10.000 denars.

Question number 6 measures the household expenditures for garage services for their vehicles from which they are not getting receipts or invoice. Average annual spending for this kind of services in Macedonia is 12.486 denars.

**Chart 6**

*Household expenditures for vehicle services*

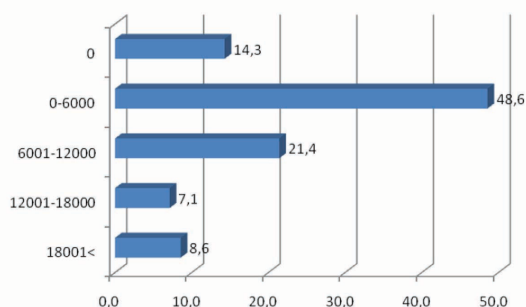


Biggest group of the households, 28.6% are spending over 18.000 denars annually for vehicle repair and maintenance. Around 23% from the households declare they are not spending at all for this kind of services. 10% are spending between 12.001 and 18.000 denars, 20% are spending between 6.000 and 12.000 denars and around 19 % are spending less than 6.000 denars.

The 7th question was measuring expenditures from households made for home maintenance, repairing, painting walls etc. Average spent money from one household for one year is 7.608 denars for one year.

**Chart 7**

*Household expenditures for home maintenance*

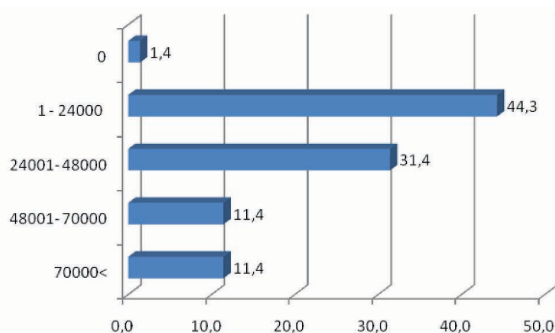


14,3 % from surveyed households answer they are not spending money at all for this kind of services, which means they are taking care for their home. Biggest group 48,6 % are spending less than 6.000 denars, between 6.001 and 12.000 denars are spending around 21%, between 12.001 and 18.000 denars are spending 7.1% and over 18.001 denars 8,6 from surveyed households.

Question number 8 was measuring amount spent on the green markets for different fruits, vegetables etc for which they don't get receipts. In this sector households are spending the biggest amount of money in the handicraft shadow economy, on average 41.646 denars for one year.

**Chart 8**

*Household expenditures on the green markets*

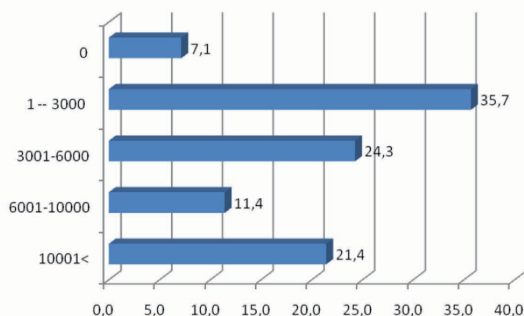


Only 1,4 % from the interviewees are not spending money for buying fruits and vegetables from nonregistered merchant in the green markets. Around 44 % are spending less than 24.000 denars, 31,4 % spent between 24.001 and 48.000 denars and 11.4 % are spending between 48.000 and 70.000 denars and over 70.000 denars. Almost every transaction in this sector is made in the shadow economy where the state doesn't have information or concrete number for the amount of transaction. If we take that we have around 500.000 households in Macedonia and multiply by the average spending from the survey, result will be in the green markets are spent 20.823.000.000 denars. According State Statistic Office in Macedonia amount spent for vegetables and fruits in 2007 is 12.084.660.000 denars or average spending per households for fruits is 7.614 and for vegetables 15.386 for 525.420 assessed household.

With the question number 9 we were measuring how much households are spending for hairstyle and makeup services, annually. From the answers average spending is 9.005 denars for one year.

**Chart 9**

*Household expenditures for makeup and hairstyle services.*

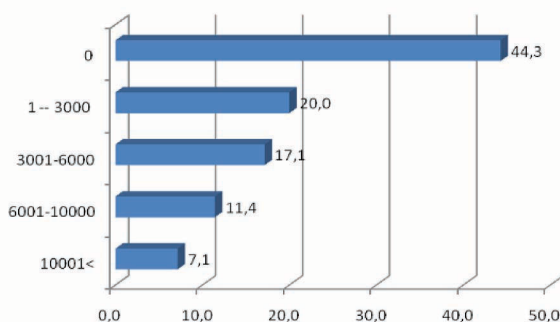


Biggest number from surveyed households, 35,7% are spending less than 3.000 denars annually for these services. Around 24% are spending between 3.001 denars and 6.000 denars, 11,4% spend between 6.001 and 10.000 denars, 21,4% spend over 10.000 denars and around 7% answered they are not paying for this kind of services.

With the increased number of PC the amount spend for software and hardware services is increasing as well. Question 10 was assessing the amount spend from the households for different kind of services for installation, changing computer parts etc. Average annual amount spent from households in Macedonia for this services is 3.644 denars.

**Chart 10**

*Household expenditures for software and hardware services.*

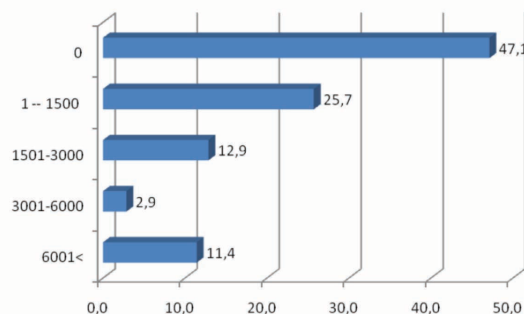


From the surveyed households 44,3 % are not spending money for this services, 20 % are spending less than 3.000 denars, 17 % are spending between 3.001 and 6.000 denars, 11,4 % are spending between 6.001 and 10.000 denars and around 7 % more than 10.000 denars.

Question 11 was measuring expenditures for cutting firewood in the smaller towns where doesn't exists centralized systems for heating. According the survey average spent money for cutting firewood annually is 3.171 denars.

**Chart 11**

*Household expenditures for cutting firewoods*

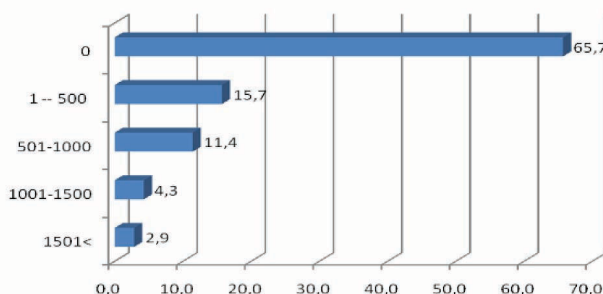


Almost half of the households don't have this kind of expenditures, 25,7% are spending less then 1.500 denars, 13% spend between 1.501 and 3.000 denars, 3% spend between 3.001 and 6.000 denars and 11.4 over 6.000 denars.

With the question 12 we were measuring amount of money spent for fortune tellers, priests, preachers etc. According the answers from the survey average spent money from households in Macedonia for services from above mention persons are 479 denars.

**Chart 12**

*Household expenditures for fortune tellers, priests, ministers, preachers etc*



Around two thirds from the surveyed households don't have this kind of expenditures; they are not using services from above mentioned persons. 15,7% spent less than 500 denars, 11% spent between 501 and 1.000 denars, 4,3% spent between 1.001 and 1.500 denars and around 3% are spending more than 1.500 denars.

**Table 4**

*List of sectors, annual household spending, percent from the handicraft shadow economy, percent from family income*

Sector	Annual average spending from one household	Structure in percentages	Percent from family income
Additional Education	7970,1	9,0	2,0
Cleaning services	1844,8	2,1	0,5
Motor vehicle services	12913,4	14,6	3,3
Home maintenance	7583,6	8,6	1,9
Green markets	41809,0	47,2	10,6
Hair style and make up services	9211,9	10,4	2,3
Software & Hardware services	3747,0	4,2	1
Cutting firewood	3291,0	3,7	0,8
Fortune tellers, priests, ministers, preachers etc	213,9	0,2	0,1

### **GDP Adjustments from the State Statistical Office for underground economy and informal sector**

Macedonian State statistical office is making adjustments on GDP calculations in order to anticipate activities from the shadow economy. When calculating GDP by production method, exhaustiveness adjustments on the data obtaining from various sources are made in order a part of non-observed economy to be covered. In the calculations, adjustments are done on two types of non-observed economy:

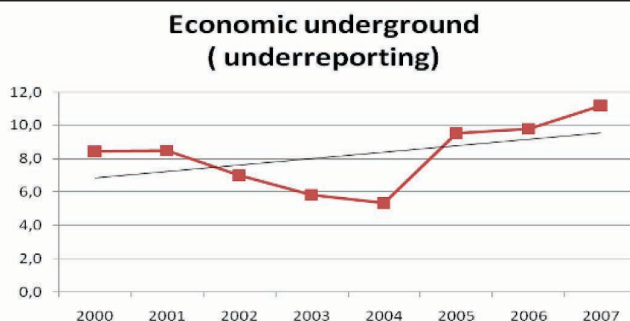
- Economic underground ( underreporting); and
- Informal sector ( not registered, underreporting)

Economic underground is identified in hiding the real value of sale, overestimating of the intermediate consumption, hiding the real value of allowed pays in order to avoid payment of turnover tax, import duties, personal taxes and employers' social contributions. According State statistical office underreport activities as a part of adjust value of GDP has a trend of increasing. From 2000 to 2007 year average percent underground economy in the adjusted value of GDP is 8,2 %.

**Figure 2**

*Underground economic activities as percent of GDP adjustment*

Source: SSO. Author's calculation.

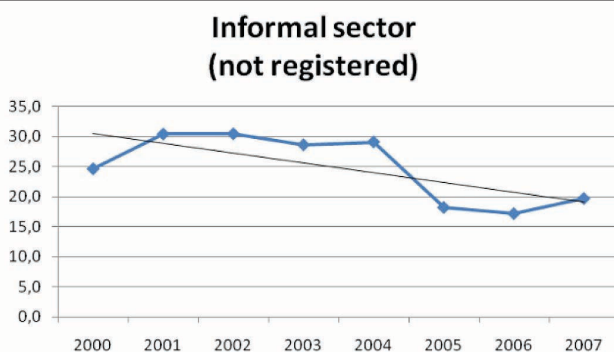


Besides economic underground State statistical office is measuring the informal sector as well. The largest part of informal activities are concentrated in own household construction, manufacturing and service activities. Estimating of the output value regarding the construction of residential units and other facilities, performed on buildings under private ownership is based on the data from the Department of construction. Estimation of the intermediate consumption is made on the base of the data from construction corporate enterprises and additional analyses.

**Figure 3**

*Informal sector as percent of GDP adjustment.*

Source: SSO. Author's calculation

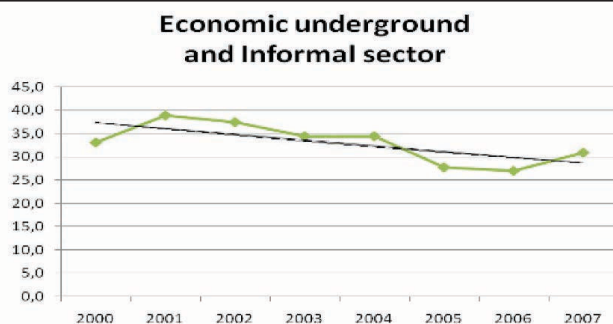


This part of shadow economy has a trend of decreasing from 2000 to 2007 year, for this period informal sector participate with 24,8% of total adjust value of GDP.

If we put together the economic underground and informal sector they had a trend of slightly decreasing from 2000 till 2007 year which is less than 10%. According the graph in the last few years there is some increasing of these shadow economy activities.

**Figure 4**

*Economic underground and informal sector as a part of adjustments of GDP*



Source: SSO. Author's calculation

## Conclusions

Integration of shadow economy in the official economy is not an easy task. There are many reasons for people and companies to work unregistered, few of them are mentioned above. In the case of Macedonia it seems that unreported activities are deeply infiltrated in the everyday life and working of people. Short term measures and actions won't give any good results for improving the situation.

Our suggestion to the government for decreasing the percent of non-registered handicraft economy is to develop long term strategy for integrating and give incentives for registering the handicraft economy into the official one. In the first couple of years people should have opportunities to register their work, but with small tax duties, lump sum taxes or timely tax exemption. At the same time opportunity cost for working in the shadow economy must be increased with severe penalties, which will make very risky and costly working unreported. After few years tax burden can be increased for a small percent.

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# UDC 336.748.12(497.7) PERSONAL INFLATION CALCULATOR

Developed by:  
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## Abstract

*To avoid imprecision and to adjust the inflation to every individual's consumer basket, we created the personal inflation calculator. This calculator gives the opportunity to every person to calculate their personal inflation rate (adjusted to their consumer basket). The number is always significantly different from the average inflation rate given by the Statistical Office. That was the reason why Center for Economic Analyses made the Personal Inflation Calculator, which is available on the organization's web site. The Personal Inflation Calculator will solve the doubts of the Macedonian citizens about the influence of the inflation over their personal budgets*

*Key words: inflation, personal inflation, calculator*

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## Introduction

There are no two individuals that are affected by the changes of the overall growth of the prices (inflation) to the same degree. If those two individuals were affected in the same manner, the need to use approximated values while calculating the inflation is not needed. The effects from inflation depend on the structure of the consumer basket. For that reason, the use of approximated values while calculating the influence of the universal growth of the prices (inflation) over the personal expense is not that much accurate indicator. That means that the consumer basket for most of the individuals will be different from the one that the State Statistical Office of Republic of Macedonia uses while calculating the average margin of the inflation.



## What inflation is and how it is measured?

Inflation is a process that measures the augmentation of prices of goods and services in the economy.

Measuring inflation is necessity for the monetary and fiscal authorities to have indicator on variations of the prices. Inflation can be revealed:

- annually,
- quarterly or
- monthly.

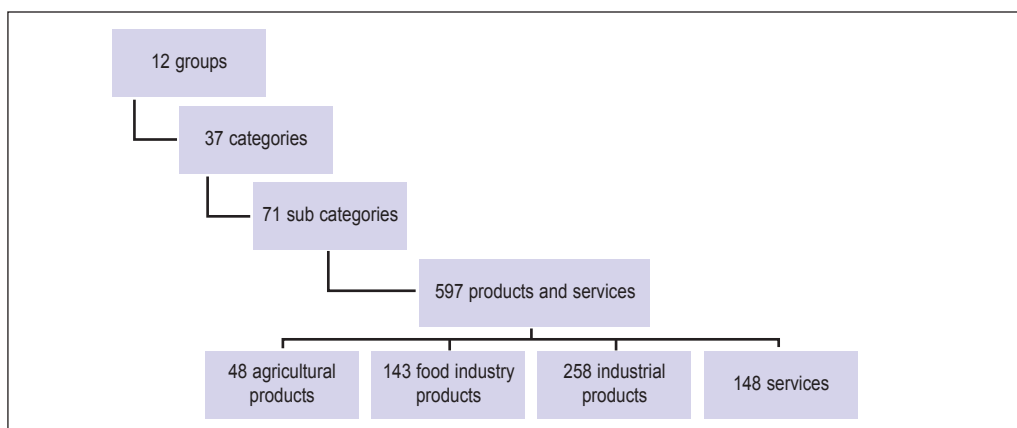
Inflation in Macedonia is measured by the State Statistical Office on a monthly basis trough the CPI (Consumer Price Index) and COICOP (Classification of Individual Consumption by Purpose) methodology.<sup>16</sup>

The Consumer Price Index measures the variations of the prices of 597 goods and services in Macedonia which are available to the families in the country.<sup>17</sup> The Consumer Price Index (CPI) of the households in Macedonia "sees" the country as a big family of 2 million citizens through its 8 offices situated in: Skopje, Ohrid, Veles, Stip, Bitola, Kumanovo, Strumica and Tetovo. On that way, the variation of the retail prices measures only:

- The consumption that is made of 597 prices of products and services available in the markets and stores in the country. Here is the brake down: 48 of the products are agricultural, 143 are food industry products, 258 are industrial products, and 148 are services.

The structure of the indexes of the consumption prices is made up of 12 groups, 37 subgroups and 71 sub categories.

Diagram: *The classification of the goods and services for which the Statistical Office makes observations (with the COICOP methodology)*



## Weights

The methodology of weights envisages updating of articles and change of weights on a yearly basis according to the consumption.

Every year, the weights with which the inflation is measured are recalculated. This editing has as a goal to reflect the change of the behavior of the consumers and to receive more adequate structure of the consumed goods and services.

<sup>16</sup>) Source: State Statistical Office of Macedonia.

<sup>17</sup>) [www.stat.gov.mk](http://www.stat.gov.mk)

**The weights in Macedonia in the period 2008-2009 are:**

Weights by groups (State statistical office)	2008	2009
01 Food and non alcoholic beverages	39,6	42
02 Alcoholic beverages and tobacco	3,9	3,8
03 Clothing and footwear	7,7	7,2
04 Housing, Water, Electricity, Gas and other fuels	12,2	12,1
05 Furnishings household equipment and routine household maintenance	4,8	4,6
06 Health	3,1	2,8
07 Transport	9,0	9,0
08 Communication	4,8	4,2
09 Recreation and culture	4,0	3,7
10 Education	0,7	0,7
11 Restaurants and hotels	5,1	5,2
12 Miscellaneous goods and services	5,0	4,8

**What does inflation show us?**

Consumer Price Index is an approximated measure, but in the same time very useful because it's comparable and measurable. In the next three graphs is shown the inflation in Macedonia (graph A), official and basic inflation in Macedonia (graph B), and comparison of the inflation in Macedonia and the countries in the eurozone (graph C).

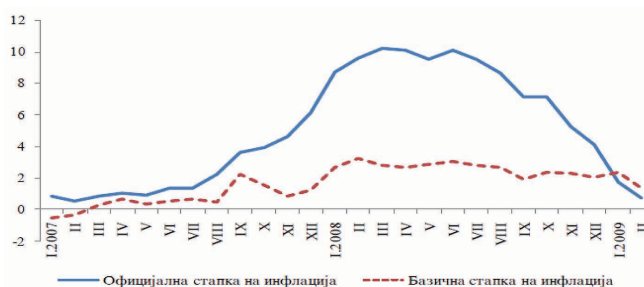
A) National level, inflation rate (black line), Expected inflation (red line)

Source: National Bank of Republic of Macedonia



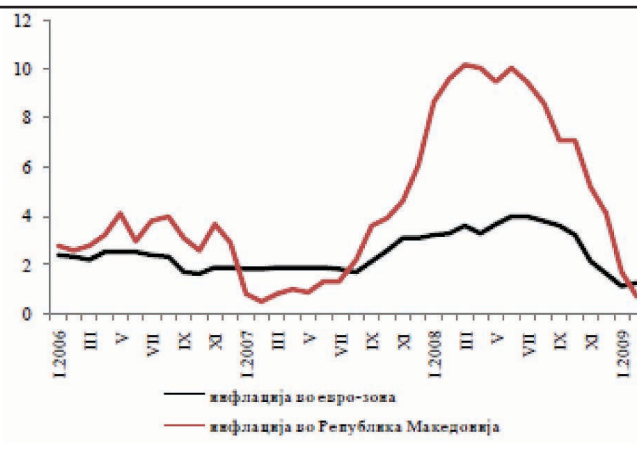
B) Official (blue line) and core inflation rate (red line) in Macedonia in percentage.

Source: National Bank of Republic of Macedonia



C) Comparison with the countries from the euro zone (red line Macedonia)

Source: National Bank of Republic of Macedonia



### Measured inflation versus Perceived inflation

*Characteristics of the measured inflation:*

- State statistical office
- The measures are done in 8 biggest cities in Macedonia
- It covers 597 goods and services

*Characteristics of the expected inflation:*

- National Bank of Republic of Macedonia
- Based on survey of expectation among companies, analysts and other relevant sources

*Characteristics of the perceived inflation:*

- Blurred
- Not measured
- Differs from the official measured inflation
- Depends on customer's behavior and point of sale

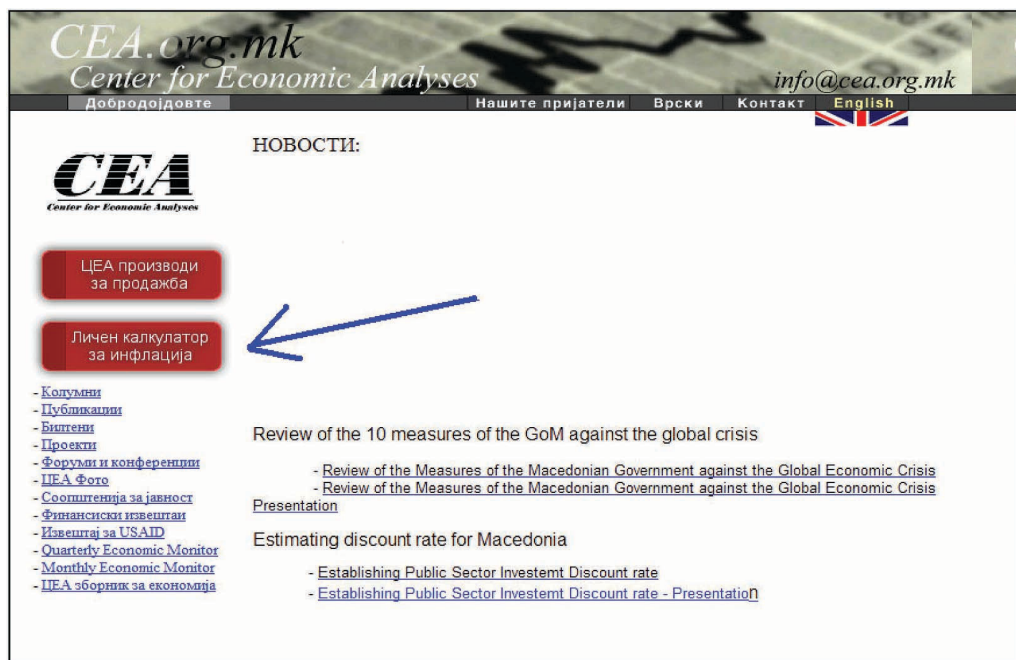
The perceived inflation has the tendency to differ from the measured inflation given by the relevant institutions in Macedonia. It differs as the result of different shopping habits of the households and the different prices at the point of sale.

Notice: The State Statistical Office of Republic of Macedonia does observations in the 8 biggest towns in the country; however, it does not take into consideration the prices of the goods and services in the smaller cities where the prices are significantly lower than the one in the bigger towns.

### Personal inflation calculator

The personal inflation calculator is available on the CEA's web page - [www.cea.org.mk](http://www.cea.org.mk). The activation of the calculator is done by clicking on the **"Personal inflation calculator,"** ("Калкулатор за лична инфлација") that could be found on the first page. It's marked with red (see picture No.1).

Picture No.1



After the activation of the calculator, its first page opens. See Picture No.2.

Picture No.2

**CEA**  
Center for Economic Analyses

OPEN SOCIETY INSTITUTE  
& Soros Foundations Network

Најави се  
Калкулатор

**Пресметајте ја вашата инфлација**

Месечен приход: 3000 - 6000 ден

Возраст: 18 - 25 години

Вработеност: Невработен

Образование: Основно

Број на членови во фамилијата: 1

Период на потрошувачка: Јануари 2009

Период за споредба: Просек 2008

Понатаму

ЦЕА - Центар за Економски Анализи  
(с) Калкулатор за пресметка на персонална инфлација  
2008 - 2009

The first page from the calculator contains several fields which need to be filled out.

Field: **"Monthly income"** - In this part you have to choose the interval in which your monthly income belongs.

Field: **"Age"** - In this part you have to choose the interval in which your age belongs.

Field: **"Employment"** - In this part you have to choose one of the following: employed, unemployed, student, retired.

Field: **"Education"** - In this part you have to choose your education from one of the following: primary school, high school, university, or others.

Field: **"Number of members in the family"** - In this part you have to choose the number that corresponds to the number of members of your family.

Field: **"Period of the consumption"** - In this part you have to choose the period (the month) for which you import the amounts you spent; in other words, the period that corresponds to your consumption.

Field: **"Period of comparison"** - In this part you have to choose the period with which you want to compare the period that addresses your consumption. In this part there are three possibilities for comparison: with the average from the previous year, with the same month from the previous year and with the previous month.

When you fill out all the parts, you have to click **"Next"** (**"Следно"**) and a new page is opened that looks like this (Picture No. 3).

Picture No. 3

Најави се  
Калкулатор

### Вашата персонална инфлација изнесува -3,18 %

Вкупно потрошени средства: 18750 денари.

Вашата инфлација во периодот од Јануари 2009 споредена со периодот Просек 2008 изнесува -3,18 %, Доколку истата сума е потрошена во периодот Просек 2008, би била поголема за 596 денари, односно би изнесувала 19346 денари.

Производи и услуги	Потрошено	Инфлација (%)
Леб и жита	750	2,9
Месо	1450	6,2
Риба	250	9,8
Млеко, млечни производи и јајца	500	0,9
Овошје	600	-17,6
Зеленчук	700	10,8
Кафе, чај и какао	300	1,8
Вино	500	14
Пиво	350	2,4
Додатоци за облека	300	3
Теписи и други покривки за под	3000	1,5
Лекови	700	0
Течни горива и мазира	1500	-30,9
Телефонски и телефакс услуги	350	-1,3
Книги	500	1,9
Образование	4000	1,3
Осигурување	3000	-14,6

Повторно пресметај

In the upper part of the page is written the name of the group of products for which you have to enter the amount spent (in denars). Under the name of the group are the other groups of products (numbered 1-12). The groups of products correspond to the international classification COICOP (Classification of Individual

Consumption by Purpose) that's used by the Statistical Office of Republic of Macedonia. The groups of products that are used in this personal inflation calculator are:

- 1) Food and non alcoholic beverages
- 2) Alcoholic beverages and tobacco
- 3) Clothing and footwear
- 4) Housing, Water, Electricity, Gas and other fuels
- 5) Furnishings household equipment and routine household maintenance
- 6) Health
- 7) Transport
- 8) Communication
- 9) Recreation and culture
- 10) Education
- 11) Restaurants and hotels
- 12) Miscellaneous goods and services

According to the COICOP classification, each group of products contains a subgroup of products- in the Personal Inflation Calculator made by CEA there are 73 subgroups of products. From the standard classification that is released by the Statistical Office, the following groups are left out: Big electrical appliances, therapeutic appliances, cars, telephone appliances and other unmentioned services from the reason that the consumption of these products and services is very rare or it is very hard to determine the monthly amount that is spent. The subgroups that are not part of your consumer basket for that determined period, you leave them blank. After you enter the amount spent (in denars), you click **"Next" ("Следно")**. Then a new page is opened (groups of products), with new subgroup that you have to fill out the amount spent. The same procedure is repeated until you go over all the 12 groups of products (with their subgroups).

After you enter the amount spent for all the groups of products, click **"Next" ("Следно")**. Then a new page is opened (see picture No. 4)

Picture No. 4

Најави се  
Калкулатор

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Образование	4000	1,3
Осигурување	3000	-14,6

Повторно пресметај

In the upper part on this page, you can see the amount spent for the period chosen previously: **"Total spending? denars"** ("Вкупно потрошени средства ? денари") and the amount of your personal inflation: **"Your personal inflation is ? %"** (Вашата персонална инфлација изнесува ? %) (Вашата персонална инфлација изнесува ? %).

Under that there is a text that has the information about how much is your Personal Inflation, what is the period of calculation and the comparison, what would be the amount (in denars) if the same amount was spent in the period that the comparison is made with, and how much is the difference between the amount spent in the period observed and the period of comparison.

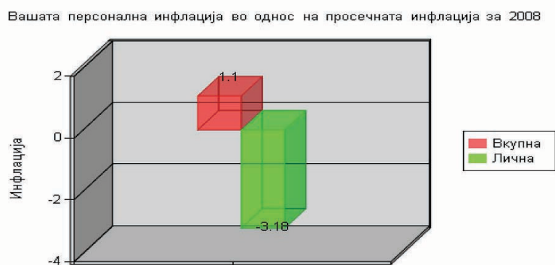
Also, on this page you can see all the subgroups of products that are part of your consumer basket, together with their inflation for the period observed.

**The amount of the personal inflation indicated the average from the inflations of all the subgroups of products that are part of your consumer basket. The weights indicate the amounts that are spent for the separate subgroups of products.**

On the bottom part of the page, there is the option: **"Calculate again"** ("Повторно пресметај"). This option gives you the choice to fix the amounts you entered previously and to calculate your personal inflation again.

At the end, the relation between your personal inflation and the inflation that is published by the Statistical office is represented graphically. (See picture No. 5). The average (overall) inflation is represented with the red color, and your personal inflation with green. This graph is about to present the two rates, actually it compares the influence of the inflation rate on consumer basket which may be lower or higher, and the inflation rate according to COICOP. If you want to calculate your personal inflation again for another period, with new amounts for the subgroups of products, you can choose the option: **"Calculator"** ("Калкулатор") that is in the upper left corner of the page.

Picture No. 5



ЦЕА - Центар за Економски Анализи  
(с) Калкулатор за пресметка на персонална инфлација  
2008 - 2009

### Conclusion (expected results)

- We hope that the personal inflation calculator that we made will help you to get accurate results for the impact of the inflation over your personal budget, which is the only important information for you. The details that the Statistical Office and other places about the inflation will not cause you uncertainty and fear, because with the Personal Inflation Calculator you can calculate if your personal inflation is the same as the published inflation. At the end, we have to mention the saying: Someone eats rice, someone eats meat, someone eats cabbage - and the result of the State statistical office shows that all eat stuffed cabbage leaves. This saying

explains how the inflation is calculated in our economy. However, this Personal Inflation Calculator will help you to see in which group you belong.

- The fields that were filled out at the front page represent a short questionnaire that give us the opportunity to analyze the consumption and the inflation according to age, education, employment, income, etc. Along with the opportunity to analyze, this questionnaire will help us to make different reports that will be available to the public and will increase your knowledge in this area.

- Throughout visits of the web site and the calculator, we expect to measure the perceived inflation of different groups of people through the stratification according to age, income, employment and the number of members of the family. In this way, we can get a percentage with which we can compare the inflation measured from the State Statistical Office of Republic of Macedonia and in that way we can publish advices for possible revision of the methodology for calculating the inflation. We think that with this online tool we will achieve two goals:

- deeper analysis of the measurement of the inflation in Macedonia according to groups, subgroups and products,
- debate and advises for the way of measuring the inflation according to separate groups of citizens.





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