Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 62 (2012) 911 – 915

Procedia
Social and Behavioral Sciences

WC-BEM 2012

Testing the cyclical asymmetries in the Romanian macroeconomic data

Viorica Chirilaa [a] *

[a]University "Alexandru Ioan Cuza"from Iasi, 700505, Romania

Abstract

According to economic theory, economic variables evolve differently on business cycles stages, i.e. they are asymmetric. The results of business cycles asymmetry testing are rather divergent: some support business cycles asymmetry while others contradict it. The existence of a possible business cycles asymmetry has major implications in economic stabilization policies modeling, forecasting and application. There are rather few studies on business cycles stylized facts in Romania and they fail to tackle business cycles asymmetry. Therefore, the purpose of our research is to test the possible business cycles asymmetry in several Romanian macroeconomic variables. We estimated the business cycles of the variables under survey using the Hodrick–Prescott filter, whereas for the tests conducted on the business cycles asymmetry recorded we preferred Sichel's (1993) methodology. We checked the robustness of the results recorded by business cycles estimation using the Beveridge Nelson decomposition. The results of the business cycles analysis carried out on Romanian macroeconomic variables do not support the existence of any business cycles asymmetry.

Keywords: Business cycles, Hodrick-Prescott filter, Baxter King decomposition, cyclical asimmetry;

1. Introduction

In economic theory, Mitchell (1927), Keynes (1936), Burns and Mitchell (1946) and Hicks (1950) are acknowledged to be the first to indicate the idea of business cycles asymmetry. In a broad sense, business cycles asymmetry means that in periods of economic growth business cycles are not the identical mirror-image of the business cycles in periods of economic recession. Sichel (1993) proposes and tests two notions related to business cycles asymmetry, which may exist either independently or simultaneously: cycle steepness and cycle deepness asymmetry. Cycle steepness asymmetry means that the economic decreasing slopes are steeper than the economic increasing slopes. Cycle deepness appears when troughs in absolute value are higher than the values identified as peaks.

The two types of asymmetry are also known in the literature on the topic as longitudinal and transversal asymmetry (Ramsey and Rothman, 1996), and unconditional and conditional asymmetry (Peiró, 2004).

The existence of asymmetry implies the necessity of embedding in the theoretical patterns of business cycles the asymmetric behavior, the identification of the policies of economic stabilization which should be established

* Corresponding Author: Viorica Chirila
E-mail address: vchirila@uaic.ro

1877-0428 © 2012 Published by Elsevier Ltd. Selection and/or peer review under responsibility of Prof. Dr. Hüseyin Arasli
doi:10.1016/j.sbspro.2012.09.154

according to the stages of the business cycles and the fact that in order to forecast the future of economy one cannot use the linear economic models which ignore the stages of business cycles.

Likewise, the existence of the two types of asymmetry has a major importance: steepness asymmetry can be determined by the patterns of asymmetric costs (production of industry firms may decrease very quickly, but it may extend less quickly), and deepness asymmetry may be determined by a model with asymmetric adjustment of prices (the negative shocks upon demand will have a bigger effect than the positive shocks upon demand).

Business cycles asymmetry testing is relatively recent and it is due to the search of new empirical characteristics of business cycles because the most used linear modeling is not able to reflect the asymmetric behaviour of business cycle. The results obtained in testing asymmetry are contradictory: Sichel (1993), Ramsey and Rothman (1996), Narayan S. and Narayan P.K. (2007) find evidence of asymmetry in the macro-economic series, while Mills (2001), Peiró (2004), Olekands (2001) do not identify asymmetries in the analyzed variables.

Sichel (1993) studied unemployment, real GNP, and industrial production with quarterly frequency recorded after the war for the U.S. and found the evidence of asymmetry for unemployment and industrial production. Narayan S. and Narayan, P.K. (2007) found steepness asymmetry for the unemployment rate and deepness asymmetry for the consumer price index and unemployment for Singapore. After studying output per capita for a sample of 22 countries, Terence Mills (2001) cannot confirm that there is steepness and deepness asymmetry at an international level. The conclusion reached by Peiró, A. (2004) is also lack of asymmetry. Peiró studied business cycles of industrial production for France, Germany, Ireland, Italy, Luxembourg, the Netherlands and the United Kingdom over the period 1957-1998. Olekalns, N. (2001) studies the asymmetry of business cycles of the macroeconomic variables in Australia, and his results fail to confirm asymmetry.

In this paper we want to test the possible asymmetries of business cycles in the macroeconomic data at the level of Romania country. We shall continue to present the methodology, on the one hand in order to test asymmetry, and on the other hand for detrending time series, then we shall present the results obtained and the conclusions.

2. Methods

2.1. Asymmetry tests

In order to test asymmetry we have to go through several stages. The first stage targets the detrending of non-seasonal logarithmized statistic series. We mention that an non-seasonal time series has the following components according to the relation:

$$y_t = \tau_t + c_t + \varepsilon_t$$

where: y_t - values of recorded variable, τ_t - non-stationary trend component, c_t - stationary cyclical component, ε_t - random component.

The cyclical c_t component obtained after the detrending time series is tested for the identification of deepness and/or steepness asymmetry. Deepness asymmetry is present when the cyclical component c_t presents a negative asymmetry, i.e. it will have a smaller number of values below the trend than those which are above the trend, and the average of deviations from the trend of the values below the trend exceeds that of the values above the trend.

Therefore, the second stage in testing asymmetry consists in calculating the asymmetry indicator and testing if it is negative and statistically significant. The asymmetry indicator is calculated using the formula:

$$D(c) = m(c)_3 / \sigma(c)^3 \quad m(c)_3 = \sum (c_t - \overline{c})^3 / T$$

where: $\overline{c}$ - cyclical component average, T – the number of recorded values, $m(c)_3 = \sum (c_t - \overline{c})^3 / T$ third degree moment, $\sigma(c)$ - standard deviation for cyclical component.

Since the c_t cyclical component is autocorrelated, Sichel (1993) in order to obtain an asymptotic standard error for $D(c)$, builds a variable $z_t = (c_t - \overline{c})^3 / \sigma(c)^3$ and with her run a regression with a constant, using Newey&West's (1987) heteroscedasticity and autocorrelation consistent standard error estimates (the intercept obtained through the regression will have a value identical with that of $D(c)$). Thus $D(c)$ obtained is asymptotically normal and allows the use of conventional critical values.