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On Some Issues Concerning Definition of an Economic Recession

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Abstract:
In the article it is shown that current definitions of economic recessions are unsatisfactory. NBER definition of an economic recession is only qualitative, so it does not enable identifying recession unequivocally. Another often used 'technical definition' of a recession takes into account only quarter-to-quarter changes in real GDP without considering changes in population, so in some cases economy can be in recession while real GDP per capita is actually *increasing*, and vice versa. Hence, the aim of the article is to propose new quantitative definition of an economic recession based both on economic and population growth or decline respectively. The use of the proposed definition is illustrated on examples of recent economic development in selected countries of the European Union.

1. Introduction

In the recent years the European Union countries as well as many other countries worldwide experienced the biggest economic downturn since the World War II. The so called global financial crisis started in the U.S.A. in the summer 2007 by a liquidity shortfall in the U.S. banking system. The trigger of the crisis was a collapse of a U.S. housing bubble that led to fall of large financial institutions or its bailout by national governments, and to large share drops around the world. After a short recovery in 2010, a lot of countries fell into a recession again during 2011 or 2012. Economic recession became one of the most cited words in today's World. But it is surprising that such an important macroeconomic term is not well defined yet. At present, there are many definitions of an economic recession, but they are all unsatisfactory, as will be shown in the following Sections. The aim of this article is to revise the current definitions of economic recessions, and to propose more appropriate definition of this economic phenomenon, which is clear, simple, precise and more natural then existing definitions.

Primer on business cycles and economic recessions can be found in the classic papers by Schumpeter (1939) or Fels (1952) or, more recently, e.g. in Rebelo (2005), Barufaldi (2008) or Newson (2009), where the last two papers focuses on the recent U.S. and EU recessions respectively.

The paper is organized as follows: in Section 2 current definitions of an economic recession are discussed, in Section 3 a new definition of an economic recession is introduced and in Section 4 economic development of selected EU countries is analysed by both new and old definition of a recession. Conclusions close the article.

2. The present state of a definition of an economic recession

There are many definitions of an economic recession in literature such as that of the National Bureau of Economic Research (NBER, 2010):

(Recession is) ...a significant decline in the economic activity spread across the country, lasting more than a few months, normally visible in real gross domestic product (GDP) growth, real personal income, employment (non-farm payrolls), industrial production, and wholesale-retail sales.

The main weakness of this definition is that it is only qualitative. One may ask, what is 'significant decline'? Is it 1 %, 3 % or 5 %? The definition does not provide any quantity to lean on at all. Also, it is not clear from the definition whether declines in all mentioned parameters (real GDP, real personal income, etc.) must occur, so the event is called a recession, or only some of them. For example after the fall of the Soviet Union in 1991 post-Soviet republics experienced a drastic fall in real GDP (cca 50 %!), but it was not accompanied by the higher unemployment, which remained at 2-3 %. So for practical use this definition is useless.

In practice another simple 'technical' definition of a recession is used:

A recession is a period of time when a nation's GDP declines for at least two consecutive quarters in a quarter-to-quarter comparison.

This definition is much better, because it is quantitative, and it consists of only one parameter (real GDP), so it can be easily evaluated. But as much as this technical definition of a recession is appealing, it is flawed.

To explain why it is flawed consider the following simple example: country A experiences 2 % growth (in real GDP) during two consecutive quarters, while country B experiences decline by 1 % in real GDP in the same period. From the technical definition of recession it follows that country B is in recession. Now suppose that in country A during the same period population growth was 3 %. It means that GDP per capita actually *decreased*. In country B demographic decline occurs by 2 % in the same period. It means that GDP per capita actually *increased*. GDP per capita is more important than national GDP, because it expresses the wealth of one (average) inhabitant. And surely such an average inhabitant would not agree that his country is flourishing, when his/her wealth is decreasing...

Hence, economic growth (or decline) cannot be separated from a population growth. It seems trivial that countries with high population growth also experience economic growth, because labor force increases (there are literally 'more hands' to do a work), and vice versa.

In literature other definitions of recessions appear, such as definition based on the unemployment growth for a given period of time. Also, the term 'depression' is used for especially deep recessions such as theGreat Depression (1929-1933) in the USA, but this term is also questionable because there is no measure of deepness or strength of recessions, but see Mazurek and Mielocvá (2013).

3. A new definition of an economic recession

In the previous Section it was showed that a definition of an economic recession must take into account a population change over a given period of time.

***Definition* 1a** *(economic recession): Economic recession is a period of time when a nation's GDP per capita declines for at least two consecutive quarters in a quarter-to-quarter comparison.*

If quarterly nation's GDP per capita is not available, it can be easily computed from nation's GDP and population change,

***Definition* 1b** *(economic recession): Let α be a quarter-to-quarter change (given as a decimal number) of a real national GDP (∆GDP), and let β be a quarter-to-quarter national population change in the same period. Then quarter-to-quarter change (given as a decimal number) in real GDP per capita is given as:*

$$\Delta GDP_{pc} = \frac{\alpha - \beta}{1 + \beta} \qquad (1)$$

Economic recession occurs when ΔGDP_{pc} *given by (1) is negative for at least two consecutive quarters.*

***Remark* 1**: From (1) it follows that an economic recession occurs when $\alpha < \beta$ for at least two consecutive quarters.

***Remark* 2**: Population change is usually expressed in year-to year format, but quarterly changes in population might be estimated as 1/4 of a yearly change.

***Remark* 3**: When the parameter β (a quarter-to-quarter national population change) in relation (1) is close to 0, then we obtain:

$$\lim_{\beta \to 0} \Delta GDP_{pc} = \lim_{\beta \to 0} \frac{\alpha - \beta}{1 + \beta} = \alpha = \Delta GDP \qquad (2)$$

Therefore, in such a case there is no difference between ΔGDP_{pc} and ΔGDP, which is logical, as population does not change.

Economic recession can be defined by a modification of NBER definition as well. Suppose that the NBER definition has logical form of 'IF then RECESSION', so it can be reformulated in the folowing way:

***Definition* 2a**. IF a significant decline in the economic activity spread across the country lasting more than a few months, normally visible in real gross domestic product (GDP) growth AND/OR real personal income AND/OR employment (non-farm payrolls) AND/OR industrial production AND/OR and wholesale-retail sales THEN a recession occurs'.

A recession occurs when the logical value of the statement is 'true'. The use of a logical conjunction/disjunction in the antecedent is up to convention. Also, all statesments in the antecedent can be quantitative:

***Definition* 2b**. IF the economic activity of the country lasts more than a few months AND declines by *α* percent, real gross domestic product declines by *β* percent AND/OR real personal income declines by *γ* percent AND/OR employment (non-farm payrolls) declines by *δ* percent AND/OR industrial production declines by *ε* percent AND/OR and wholesale-retail sales declines by *η* percent THEN recession occurs'.

In Definition 2b threshold coefficients can be established by some consensus or empirical research.

4. Examination of an economic development in selected EU countries

In this economic development of selected EU countries with regard to proposed definition of a recession (Definition 1) during the last two years will be examined. Real GDP quarter-to-quarter growth rates were taken from Eurostat (2012), see Table 1, while annual population growth data were obtained from IndexMundi (2012), see Table 2. For an

examination 4 major EU economies were selected: Germany, France, Italy and UK, and 2 small transition economies from the former Eastern bloc: Lithuania and Romania.

Recessions according to the technical definition of recession are presented in Table 1 in bold figures: only Italy and UK experienced recessions during examined period.

When real GDP per capita quarter-to-quarter growth rates instead of real GDP quarter-to-quarter growth rates are used, the data change slighty (up or down by one or two tenth of a percent), see Table 3. From new figures a new recession by Definition 1 emerges in France, and the recession in UK is now slightly deeper. On contrary, in Lithuania and Romania GDP per capita growth rates are higher (and positive), because both former communist countries experienced population decline in the selected period. The rest of the data remains unchanged.

The example illustrates that when a population change is small than the evaluation of recesions with regard to Definition 1 can be significantly different only in cases when quarter-to-quarter GDP growth rates are small, typically 0-0,3 %. However, when a population growth is high (1 or 2 % annualy), as it is a case in South Asia countries, Canada or Brasil, then the evaluation of a recession by Definition 1 can be significantly different. For example India's GDP grows around 7 % each year, but the population growth is cca 1.3 % according to IndexMundi (2012), so India's annual GDP per capita growth is 'only' around 5.7 %. The same applies to countries with large population declines (e.g. for Russia).

Table 1. Real GDP quarter-to-quarter growth rates.

	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2
Germany	0,7	2,2	0,7	0,6	1,2	0,5	0,4	-0,1	0,5	0,3
France	0,3	0,7	0,4	0,4	0,9	0,1	0,2	0	0	-0,1
Italy	0,9	0,6	0,5	0,2	0,1	0,3	**-0,1**	**-0,7**	**-0,8**	**-0,7**
UK	0,6	0,7	0,6	-0,4	0,5	0,1	0,5	**-0,4**	**-0,3**	**-0,4**
Romania	-0,7	0,4	-0,8	0,9	1,2	0	1,1	-0,1	0,1	0,5
Lithuania	0,6	0,9	0,8	2	1,6	1,7	1,2	1	0,3	0,6

Source: Eurostat(2012).

Table 2. Annual population growth of selected countries.

country	2010	2011	2012
Germany	-0,06	-0,21	0,2
France	0,53	0,5	0,5
UK	0,56	0,56	0,55
Italy	-0,08	0,42	0,38
Lithuania	-0,28	-0,28	-0,28
Romania	-0,25	-0,25	-0,26

Source: IndexMundi (2012).

Table 3. Real GDP per capita quarter-to-quarter growth rates.

	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2
Germany	0,7	2,2	0,7	0,6	1,3	0,6	0,5	-0,1	0,4	0,2
France	0,1	0,5	0,2	0,2	0,7	0,0	0,1	**-0,1**	**-0,1**	**-0,2**
Italy	0,9	0,6	0,5	0,2	0,0	0,2	**-0,2**	**-0,7**	**-0,8**	**-0,7**
UK	0,4	0,5	0,4	-0,5	0,3	0,0	0,3	**-0,5**	**-0,4**	**-0,5**
Romania	-0,7	0,5	-0,8	1,0	1,3	0,1	1,2	0,0	0,2	0,6
Lithuania	0,7	1,0	0,9	2,2	1,8	1,9	1,4	1,2	0,4	0,7

Source: own calculations.

5. Conclusions

In this article a new definition of economic recession was proposed, and its use was demonstrated on real GDP and population data of selected EU countries. It was shown that according to the new definition of an economic recession France was in a recession recently, while according to the old technical definition it was not. The differences between both definitions can be neglected when population change is small, but when population changes rapidly, then the difference might be significant.

Another still unresolved problem concerning economic recessions is the evaluation of their strength or severity, as current recessions are often compared with recessions of the past, expecially with the U.S. Great Depression 1929-1933; see e.g. Gascon (2009) or Eichengreen (2010). The paper by Mazurek and Mielová (2013), which introduces recession magnitudes and divides recessions into four categories (minor, major, severe and ultra), might be considered the first step in this direction.

References

Barufaldi, D. (2008). A Review of Past Recessions. http://www.investopedia.com /articles/economics/08/past-recessions.asp.

Eichengreen, B. O´Rourke, K. (2010). What do the new data tell us. *VOX*, 3, http://www.voxeu.org/index.php?q=node/3421.

Eurostat (2012). http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/.

Fels, R. (1952). The Theory of Business Cycles. *Quarterly Journal of Economics*, 66, pp. 25-42.

Gascon, C. S. (2009). The Current Recession: How Bad Is It? *Economic Synopses*, 4, http://research.stlouisfed.org/publications/es/09/ES0904.pdf.

IndexMundi (2012). http://www.indexmundi.com/.

Mazurek, J., Mielcová, E. (2013). The Evaluation of Recession Magnitude: Introduction and Application. *Prague Economic Papers* (in print).

National Bureau of Economic Research (2012). http://www.bank.gov.ua/ENGL /Macro/index.htm.

Newson, B. (2009). Recession in the EU-29: Length and Depth of the Downturn Varies Across Activities and Countries. *Eurostat: Industry, Trade and Services*, 97, http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-097/EN/KS-SF-09-097-EN.PDF.

Rebelo, S. (2005). Business Cycle Models: Past, Present and Future. http://www.kellogg. northwestern.edu/faculty/rebelo/htm/rbc.pdf.

Schumpeter, J. A. (1939). *Business cycles: A Theoretical, Historical and Statistical Anaylsis of Capitalist Process*. McGraw-Hill.