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Invited Review

BUSINESS CYCLE – GROWTH NEXUS: A REVIEW

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Abstract. Frequent reversals in business cycles pose the question whether country can achieve macroeconomic stability and/or economic growth by coordinating its economic policies. Thus, what is the role of economic policy within the short/long run in amplifying or dampening shocks? Business cycle – economic growth relationship is rather ambiguous and has, thus, attracted controversy. In this sense the (dis)belief that there indeed exists a relationship between the economic growth and business cycle, and their long-run convergence brings us to three important hypotheses that: (1) the evaluation of cycle-growth bond is inconclusive, (2) empirical testing of cycle synchronization is exaggerated and (3) the hypothesis of coupling/decoupling is ambiguous and can be misleading. Economic growth is a complex process and cannot be attributed to a single factor of observance hence this essay is just a tool of theoretical reasoning with firm grip on empirical circumstances that lead us to consider some issues that dwell the "growth economists" these days. Our study suggests a conclusion that discussions on the cycle-growth nexus are far from over, revealing us some remarkable confrontations within empirical domain.

Keywords: business cycle, growth, short/long run relationship, cycle synchronization, decoupling.

JEL Classification: F44, E30, E32, E37.

Introduction

The fact that world economy is in persistent stagnation and in major turmoil confirms that the fields of economic development and economic growth have drifted apart, leaving an empty space for the so-called "unbalanced growth". At the start of a New Millennium the development thinking has evolved into a broad pragmatism, realising that development must move beyond economic growth by embracing relevant social goals, however experience has shown that "officially proclaimed" global trends rimmed in the term globalization have brought the world economies to havoc. The globalization process has its victims too. Prior to economic crisis, blind faith in the efficiency of deregulated financial markets,

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profligacy through speculative finances and absence of cooperative real and monetary system, moreover the absence of a cooperative international system was weighted against the real increase in output or expansions of productive capabilities i.e. against the economic growth and development. Growing disconnection to social interests such as improved quality of life, investments in health and education, reduction of poverty etc. means that development economics is losing ground to its own coined state of sustainable development. Namely the ("Washington") consensus on ensuring macroeconomic stability under the mask of sustainable progress has yielded illusory expectation that all development changes are managed well within the neoclassical paradigm. But the frequently stressed macroeconomic stability is only an essential but insufficient requirement for economic growth as discussed in Sharma and Škare (2003). Macroeconomist have spent too much time on stabilization and neglected growth, which is much more important issue for macroeconomics to study. This is even more important if we notice some recent trends which suggest that economic activity in many developed countries and in most of emerging countries is still suffering from the impacts of the 2008–2009 recessions.

Probably due to its lack of empirical relevance following the "golden years" of 1950s and 1960s, growth motivated studies were fading away handing over the primacy to the short-run oriented business cycle models. After the mid 1980s, research on economic growth again experienced a boom as a recollection of contributions that do not dwell on the fact that determinants of long-run economic growth are far more crucial in comparison to the mechanics of business cycle. As Barro and Sala-i-Martin (2004) point out, recognition of the significance of long-run growth was only a first step economics had to do to escape the "prison" of the neoclassical growth model. This is area that is now called endogenous growth theory. Other recent studies have extended the older, neoclassical growth model, to bring out the empirical implications for convergence across economies. One must not forget that short-run disturbances can produce extremely negative effects. Business cycles at their peak can be very harmful for the whole economy. Atop, economic booms establish abruptly large profits for the entrepreneurial class and obstruct the way that middle or "working" class can earn constant incomes. These problems are often intensified by a strong increase in prices. At the bottom, business cycles produce negative growth rates, unemployment and poverty. Therefore, it is in interest of society to (try to) control cyclical behaviour of an economy (Benazić, Tomić 2014). Business cycles have long been characterized in terms of how they evolve over time. However, in this study emphasis is placed on the possibility that there exist numerous determinants of cycle-growth nexus that can explain changes in economic activity around the world and over time. Thus, the aim of this paper is to critically evaluate the (i) relevance of cycle-growth trade-off, by relating the pattern of growth between countries through the concept of "synchronization" of business cycles (ii) evaluate if economic growth across countries and over time is formed through mutual dependence or interdependence in growth performance, i.e. by analyzing the concept of (de)coupling. Overall, the paper presents a recapitulation of the recent scientific contributions in this area.

1. Is there a trade-off between cycles and growth?

To answer this question, or at least to debate it, we must get back to theoretical business cycle models that evaluate growth within distinct features, namely exogenous or endogenous. Economic growth is a process dependent of variety of economic and non-economic forces that directly or indirectly influence economic progress. In the past, most economists were unanimous over the crucial importance of capital formation (Sharma 2002). Another important factor of progress is the development of science and technology which can result in improvements in productivity, quality and novelty. Suitable institutional framework is important as well. Not to forget that demographic factors also present a special problem to economic growth. Following the great optimism that Keynesianism brought in the post-war period through coherent and systematic approach in dealing with aggregate economic phenomena and explaining growth, late 1950s and early 1960s brought the change in paradigm, generally in the scientific circles. Following the development of neoclassical growth models from Solow-Swan approach (Solow 1956; Swan 1956) to recollections of Ramsey (1928), the study of economic growth languished after the late 1960s. The return of business cycle related economic troubles in the 1970s, after almost a decade of economic prosperity and the accompanying high rates of inflation came as a rude awakening for many economists (Plosser 1989, 1992). Then after the tranquilization of decade or two, the research on economic growth became vigorous again in the late 1980s when new studies stared modelling long-run growth on the path of endogenous approach. Constant debate whether cycles do explain growth or that some factors e.g. technology account for substantial portion of growth not minding economic fluctuation raised the question if there is a constant trade-off between business cycles and economic growth. Modern equilibrium business cycle theory starts with the view that growth and fluctuations are not distinct phenomena to be studied with separate data and analytical tools (Cooley, Prescott 1995), accordingly we evaluate the so-called *real business cycle theory* in accordance to its conclusions and reflections to other theories.

While the technological progress has been recognized as an important factor determining economic growth since Solow' famous paper, it has been common to think of economic growth as something that can be studied independently of economic fluctuations i.e. that the factors that influence growth have only second order implications for economic fluctuations (Plosser 1989). On the other hand, it has also been common to think of business cycle as the deviations around a smooth and stable trend growth path. Considering that trend and fluctuations (cycles) are determined independently for analyzing their behaviour two different types of macroeconomic models were used: (1) neoclassical growth models focused on trend component by emphasizing importance of capital accumulation, labour and productivity growth, (2) Keynesian models analyzed cyclical component considering the interaction of consumption and investment as key factors (Gaggl, Steindl 2007). This dichotomy was broken by the introduction of the real business cycle theory initiated by Kydland and Prescott (1982) as well as Long and Plosser (1983). Their research has presented a serious challenge to all previous mainstream accounts that focused merely on aggregate demand shocks, particularly those that emphasized monetary shocks (Snowdon, Vane 2005).

The *real cycle* approach is in contradiction with both: the conventional Keynesian analysis as well as monetarist and new classical monetary equilibrium theorizing where equilibrium is identified with a stable trend for the natural (full employment) growth path. As seen, within Keynesian tradition departures from full employment are viewed as disequilibrium situations where social welfare is below potential level and government has a role to correct this macroeconomic market failure using fiscal and monetary policy. An interesting discussion on this topic is provided by Snowdon and Vane (2005). They stressed that for conventional (neoclassical) wisdom extremely shocking was the bold conjecture advanced by real business cycle theorists that each stage of the business cycle (peak, recession, trough and recovery) is equilibrium. The "truism" that economic booms are good and that economic slumps are bad was considered within the neoclassical synthesis where the assumption that "full employment" represented equilibrium and that recessions were periods of welfare-reducing disequilibrium implying market failure and the need for stabilization policy. As it can be seen, real business cycle theory has in its own manner rejected this market failure view. Nevertheless, the standard *real business cycle model* is essentially a neoclassical growth model in which exogenous technological progress is modelled as a stochastic process. Kydland and Prescott (1982) addressed the cycle as the real phenomenon and that the neoclassical framework can account for most of the cyclical component. This conclusion can however be criticised but also evaluated from many different aspects. Fiaschi and Sordi (2003) distinguished three main approaches to the study of interaction between growth and cycles. First, real business cycle theorist have studied this interaction within a stochastic business cycles framework, where cycles are in fact generated by continuous exogenous technological shocks. Second, many exogenous growth theorist have been analyzing the implications of sound micro-foundation of technological progress on the relationship between growth and cycles mainly through the Schumpeter's (1939) creative destruction and learning by doing process (see Aghion, Howitt 1992; Grossman, Helpman 1991; Stadler 1990; and others). And third, there was a given possibility of multiple steady states that assured improvement of out-of-steady state i.e. cycles in a deterministic framework. All of this had enormous influence on the perspectives of New Keynesian economics or even the Austrian theory of business cycle. It appears that such integration of economic growth and business cycle theory is understood as one of the most, if not the most, important achievement of the analysis (Fiaschi, Sordi 2003).

Real business cycle theory has its share of criticism too. From the fact that it mainly relies on the models with unobservable shocks; and that it treats unemployment either entirely absent or voluntary, that recessions are periods of technological regress, that it presupposes the neutrality of money and the irrelevance of monetary policy for real outcomes, that it considers real gross national product is as persistent as a random walk with drift (see Nelson, Plosser 1982), that it uses a representative agent which translates in sidestepping of aggregation approach which is inherent to macroeconomics (for critical surveys see: Hoover 1988; Mankiw 1989; Phelps 1990; Stadler 1994; and other various authors). But one of the most important criticism relates to the lack of robust empirical testing (Snowdon, Vane 2005). Gaggl and Steindl (2007) offered a deep insight in the relevance of real business cycle theory as they, not surprisingly suggested, that different models guide us to different results. Namely by analyzing numerous studies, they concluded that the existing empirical literature is am-

biguous. Stadler (1990), Martin and Rogers (1997) as well as and Blackburn and Galindev (2003) found negative relationship between volatility and long-run growth, whereas Blackburn (1999) and Blackburn and Pelloni (2004) challenged these findings. Next Ramey, G. and Ramey, V. A. (1995), Kneller and Young (2001) and Döpke (2004) found negative correlation between high frequency fluctuations and long-run growth. However, Kormendi and Meguire (1985), Grier and Tullock (1989) and Stastny and Zagler (2007) found that a larger amplitude has a positive effect on the long-run growth. Imbs (2007) found positive effect of the sectoral volatility on growth and in that manner suggested irrelevance of the results of this relationship on aggregate level. Assessing the empirical plausibility of the real business cycle theory, Eichenbaum (1991) concluded that the evidence put forward by its proponents as "too fragile to be believable" (Snowdon, Vane 2005).

The goal of this short insight into the growth perspective was to evaluate whether there exists a trade-off between business cycles and economic growth. The relationship between cycles and growth has been tackled from many different points of view of many different economic paradigms, yet only, the real business cycle theory, addressed this problem comprehensively enough, at least in our view. Hence the properties of neoclassical growth theory have always been questioned not only empirically but also on theoretical grounds. Notwithstanding the contributions of orthodox monetary school, new classical school and the influence of R. E. Lucas (1976), New and Post Keynesian school, Austrian school, even the new political macroeconomics, it seems that real business cycle theory lead us to believe that we cannot look separately cycle-to-growth or growth-to-cycle relationship. There exist important interactions between the process of growth and business cycles and that the conventional practice of separating growth theory from the analysis of fluctuation is illegitimate. This is what the theory states. Is this true when we turn to empirics? To our mind, no! We might say that this cycle-growth bond in the manner of trade-off is *de facto* inconclusive! If we observe empirical studies there is no strict evidence that would confront our hypothesis of inconclusiveness. In fact our conclusions are in line with those of Fiaschi and Sordi (2003) who stated that the determinants of the long-run economic growth is still exogenous by construction, therefore neither the causality nor a correlation between growth and fluctuations can be compressively investigated. Hence, there was not found any sound empirical evidence on the sign of cycle-growth nexus. Although, we did not attempt to directly answer the question involving trade-off possibilities, we however conclude that long-run economic growth and business cycles are mutually intertwined and are generated by the same sources, therefore they must be jointly analysed.

2. Business cycles synchronization and growth perspectives

Traditionally, economic growth is considered as one of the most important variable indicating the expansion of economic activity in a country. If we evaluate its broader aspect together with the globalization of economic activities we may conclude that currently there is an increased interest in growth trends (better say, patterns of growth) and their synchronization on a global scale. As already mentioned, many studies taken up since the 1960s, have shown that cyclical regularities and fluctuations can explain real economic movements, therefore

studying business cycle has become an indispensable part of growth related research. The concept of "synchronization" (of growth rates primarily) as an indicator that shows the degree of co-movements of the fluctuations across economies and time has come to be recognized as a prerequisite for any higher form of economic integration (for example *Optimal currency area* (OPA) on international level or *industry structure synchronization* on the basis of country-specific features)[1].

There exist a wealth of literature dealing with the analysis of cycle-growth synchronization, yet most of the researches are concentrated on the countrywide level and not many on regional level, for example comparing industry business cycle[2] (Kwan, Kun 2009; Dixon, Shepherd 2013; Bierbaumer-Polly 2012). Academic literature, especially in Europe as well as the media press is full of references and studies that imply the importance of the synchronization of links between economies. In dealing with the hypothesis of (de)coupling (in succeeding section) we come to note that these studies, in fact, contemplate same scientific problems though use different methods of analysis thereby improve their positions for conclusion. However, most of them are inconclusive or repetitions and not revisions (not true for the studies dealing with regional industry structure, but true for "European business cycle"). By analyzing current literature we evaluate the excessive empirical research patterns in order to test its scientific significance. But first let's give a terminological glimpse on the issue of synchronization.

The usual interpretation given by scholar to the concept of synchronization between growth and business cycles relates to the pattern of growth between these countries rather than the magnitude of growth rates or the amplitude of the growth or business cycles as stated by Crowley and Schultz (2010). They have pointed out two important reasons why synchronicity in movement of economic growth rates is economically relevant: (1) the more globalize world becomes, the more likely is that trade and financial flows will cause great synchronization in growth rates between countries which results in creation of "the international business cycle" and (2) for countries that use the same currency (such as European Monetary Union – EMU) similar movements in economic growth could either indicate (i) *ex ante*, the suitability for adopting same economic policy (for example monetary policy in OPA theory for EMU) or (ii) *ex post*, the fact that that (monetary) policy has been a major factor in achieving similar patterns of growth (known as endogenous OPA theory). Generally, argument for synchronization can be extended for greater harmonization of the business cycle is seen as a mean to achieve a more stable environment for exchange rate developments (Hufbauer, Schott 1992).

Here are some stylized facts on the business cycle positions. First, the common measure of economic growth is gross domestic product, so most of the researches use GDP growth rates as the reference variable. Alternative measures are industrial production, (un)employment or some kind o indicator that utilises a broad set of economic variables. Though GDP

[1] Cross-country business cycle synchronization can be attributed to common shocks, industry-specific shocks and country-specific aggregate shocks. There are three main channels through which these shocks can be transmitted from one country to another: international trade in goods and services, international trade in financial assets and cross-country linkage of production sectors. The impact of some factors on business cycle synchronization can be explained by the above shocks (Kwan, Kun 2009).

[2] Lately we can find some literature on the co-movement of regional series and the relationship between regional co-movements and similarity (or dis-similarity) of industrial structure, amongst other things (Dixon, Shepherd 2013; Bierbaumer-Polly 2010, etc.)

growth rates have many methodological drawbacks, however, the main advantage over other multivariate series is that it avoids uncertainty about the turning points in the business cycle (Bierbaumer-Polly 2010). Second, it is common to distinguish two types of business cycles. *Classical cycles* are identified as peaks and troughs in the cycle. Peaks are identified by being followed by absolute declines in output, troughs by absolute increases. Such cycles are, of course, comparatively rare in growth economies and to focus attention only on these would lead to a paucity of observations (Artis 2004). *Deviation cycles* analysis is concerned with phases of above and below trend rates of growth as this it is known also as a growth cycle approach. As classical cycles are comparatively rare, most of the studies are conducted using the deviations cycle approach. Third question is related to the identification of cyclical movements. For classical cycle approach there exist a number of different dating procedures which can be classified as either belonging to the group of non-parametric (Bry and Boschan BB algorithm and similar algorithms) or parametric methods (for example Hamilton switching regime method). The main question within deviation cycle approach is how to decompose the trend and cycle component from real output. There are a number of parametric methods that are usually considered as best: state-space models with common factors models, unobserved component, state-dependent Markow-switching models, then Kalman filter, ARIMA with Beveridge-Nelson decomposition, etc. The production function approach of the OECD also belongs to the class of multivariate methods to estimate trend component of output and the output gap. There are also linear regression models. Non-parametric methods or "ad hoc" filters, mostly band pass, are widely used in detrending procedures because though many of them have technical and methodological disadvantages they are *de facto* easy to perform. Here we find first-order differencing (FOD) filter, Hodrick-Prescott (HP) filter, Baxter-King (BK) filter, Christiano-Fitzgerald (CF) filter, phase average trend method PAT by Boschan and Ebanks, etc. After a long period in which it was held that the correct method of detrending could not be decided upon and yet was critical in effect there seems now to be some convergence of opinion on the idea that a band pass (BP) filters is broadly optimal (Artis 2004). Fourth question is pointed towards methods for measuring business cycle synchronization. In general, a variety of methodologies exist in the literature to examine the co-movement of two or more time series: cross-correlations, dynamic correlation measure, diffusion indices, see (Artis *et al.* 2004), consistency tables, pair-wise coherence indicator, concordance indicator (see Harding, Pagan 2002, 2003a, 2003b), diversified methods of synchronicity and similarity by Mink *et al.* (2007, 2012), "shock accounting" method, etc. By synchronicity we imply the similarity of movements in growth rates over time, which means that we have to be careful while analyzing convergence which presents the proximity of growth rates with growth rates of other observed country or unit. Many studies opt to calculate both indicators in order to serve better conclusions.

Existing literature on the issue of cycle synchronicity is vast. To narrow empirical base in order to make it easier to comprehend the dwelling within this section we analyze evidence for business cycle synchronisation only for the EMU, (see Inklaar *et al.* 2008)[3]. Fatás (1997) by measuring employment growth correlation in EU 12 suggested that correlations are higher

[3] In this part we follow the systematisation made by Inklaar et al. (2008) and extend it for some newer studies.

in the EMU then before it. Artis and Zang (1997, 1999) by using PAT and HP calculated lead and lag bivariate correlations indicating that cycles have become more group specific after the exchange rate mechanism (ERM). Angeloni and Dedola (1999) analyzed GDP (and some related variables) correlations and came to conclusion that there has been a significant increase in correlation after the 1992. Döpke (1999) made rolling contemporaneous correlations based on a five year moving average for HP detrended data and suggested an increase in correlation between most of EU countries and the euro area. Similar conclusion came from Koopmans and Azevedo (2008) who used CF filter, Massmann and Mitchell (2004) who used various methods, Darvas and Szapáry (2004) who used HP and BP filters, Altavilla (2004) who used BB and Harding-Pagan procedures, HP and BP filters as well as Markov switching model, etc. Beine *et al.* (2000) by analyzing common features and co-dependence analysis in VAR model found that some countries in the EU do not constitute a similar currency area as no common cyclical features were found. Harding and Pagan (2001), on the other hand, made correlations and regression on binary series (rule of level series, HP, PAT, co-spectrum) and found relatively low correlations between members countries and euro area, yet correlation still exists. Valle e Azevedo (2002) with almost similar approach concluded that in fact there exists a high correlation of in-phase cyclical movements. Beine *et al.* (2003) analyzed unemployment with probabilities from a Markov switching VAR model (several indicators similar to concordance indices) and noticed more synchronization amongst EMU members compared to European Periphery. Garnier (2003) analysis based on various characteristics including concordance index of classical cycle determined with BB procedure suggested that core group of euro countries show increased similarity with German cycle. Most of the studies were based on the comparison either with euro cycle variable or specific country (Germany or USA). Artis *et al.* (2004) found considerable commonality within EU.

Camacho *et al.* (2006) with three different measures of synchronization found relatively high linkages across euro countries, but these are prior to the establishment of the monetary union. Mansour (2003) found that world component is generally more important than the European component; European component varies widely among EU members. However, EU emerges as the most integrated block in the world. Rozmahel (2009) by using moving window averages and different detrending techniques come to conclusion that there exists higher GDP and industrial production cycles synchronicity of the Euro zone countries than in the Central East European countries and Baltic countries towards the Euro area average. Woźniak and Paczyński (2007) used the Kalman filter to extract time-varying spectral properties of GDP growth rates in new member states and the euro are and to estimate the coherences between these series. The analysis of individual spectra has confirmed the existence of several common features such as concentration of power in the low and business cycle frequency ranges (i.e. for cycles lasting above around 3 years). Beyond this, there is also substantial heterogeneity between estimated spectral properties of individual series, similarly to what has been found elsewhere in the literature. Van Aarle *et al.* (2008) came to overall conclusion that on average business cycle convergence in the euro area has not changed substantially since the introduction of the euro. This result seems fairly robust to the measurement of the cycle and to different sample periods. Thus, a clear – positive or negative – "euro effect" on synchronization does not appear in the latest available data. However, Wälti (2009) using probit regressions

of synchronicity found that although the introduction of the euro has raised the likelihood of business cycle synchronicity, it has not affected the relative amplitude of business cycles.

Apostoaie *et al.* (2014) evaluated credit cycle – business cycle relationship within the synchronicity perspective of ten states from Central, East and Southeast Europe suggesting that banking sectors should not be overregulated for it limits their lending capacity. Crowley and Schultz (2010) by measuring topological differences between GDP growth pattern in recurrence plots for individual countries concluded that there are certain periods of time when growth rate synchronicity increased and these appear to be during the "new" EMS period after 1983 up until roughly 1990, and then again from 1997 through until 2002. After 2002 synchronicity is only higher against the non-euro area European member states, and does not appear to be more synchronous than the international grouping of countries/entities. The corollary of this is that international business cycles, due to globalization, had a bigger impact than regional factors such as monetary union for most of the period, with only these two exceptions. Antonakakis and Tondl (2014) reassessed that business cycles have become more synchronised in the EU. An intensive work by Mink *et al.* (2007) led to a paper in 2012 which introduced new insight into measurement of synchronicity. Overall conclusion was based on the fact that the synchronicity and similarity between output gaps of individual countries and the reference fluctuate over time, and often are not higher than would be expected under output gap independence. Namely, the euro area output gaps are not more synchronous or similar at the end of 2006 than in the 1970s, while the output gaps of several individual countries still exhibit little coherence with the euro area reference. Hence this is just the fraction of the literature dealing with the concept of synchronicity within the EU, not to mention there is a bulk of literature too dealing with this concept on a global scale.

The number of research on synchronization issue is rather over-exaggerated as is evident from the above. However, the results of some studies suggest that post 1990s is the time in which business cycles in the euro area have become more similar and the business cycles of many euro countries are still substantially out of sync[4]. Additionally, average business cycle convergence in the euro area has not changed substantially since the introduction of euro. There is hardly a need for many investigations since with same systematic approach all will arrive at more or less similar conclusion. This is what we test in the next section. However, given the empirical facts, we can say that there are possibly numerous elements that affect the cycle-growth nexus around the world and over time. Some countries experience growth faster than others in a specific time perspective or its growth pattern can be different in comparison to other countries, regions or the world in that manner. Methodological contributions are desirable as they improve epistemological position of the issue, but we see most of the studies contemplate more or less same implications. That is why we need to agree over the excessiveness or exaggeration in empirics. Not to be flaming in our deductions we can conclude that synchronicity is a feature that is built on theoretical, as well as empirical grounds, so conclusions based on a set of real data assure scientific and applicative basis for further research. It is still a statistical regularity rather than a structural characteristic of universal type, despite the never ending process of globalization. We are of opinion that further empirical

[4] Similar characteristic is following studies that observe synchronicity as a global issue.

studies should be pointed towards testing the legitimacy of convergence aspirations and its economic policy implications on three levels: (i) country-specific cycle-growth relationship, (ii) business cycle of periphery in comparison the centre of development and only then (iii) proceed and uncover stylized facts about synchronicity of national cycles with respect to for example Euro area business cycle. Not to forget, investigations on the regional level concerning regional co-movements and (dis)similarities of industrial structure is of utmost importance as well. These conclusions bring us closer to the next topic which explores the venue of globalization through the hypothesis of decoupling.

3. How strong is the bondage of globalization; decoupling hypothesis?

After the high hopes of Bretton Woods and the "golden decades" of 1950s and 1960s were watered down, came "the slowdown of 1970s", "the lost decade of 1980s" and "the decade of mixed results of 1990s" followed. Economic growth of the post WWII paved the way for "the global village of 2000s". It was, however, characterized with the blows of strong winds of globalization and economic liberalization raising once again the hopes of humanity at the beginning of the New Millennium. Alas! All in vein (Sharma 2015). The new forces that facilitated significant economic growth, trade liberalization, stable inflation rates and reduction of poverty had not been achieved without socio-economic costs. Times of moderate growth rates in developed countries and impressive growth performance of some emerging countries has been seriously threatened by the recent financial turmoil, as the moment of true economic recovery is not yet in sight. However, most of developed countries and a large number of developing countries are still "in pain" from the aftermaths of recent recession, many emerging countries are riding on the waves of large domestic demands, amplification of domestic investments and productive capacities. Capital inflows as a consequence of higher interest rates, as well as well balanced structural reforms have kept their growth rates at envious levels. Once called peripheral areas, today places of major investing plans Asia, Eastern Europe and South America have initiated a rapid process of growth driven by the above mentioned elements, export and foreign direct investments, before from industrialised countries, now among each other. Lately, output growth was strong in East, South and South-East Asia, Latin America and Caribbean in between 3–5% as domestic demand encouraged by various income policies (in China, India, Thailand, Philippines, Brazil, Argentina etc.) supported this trend (Sharma 2010). Even before the crisis, growth performance of China and India seemed to be unaffected by relative slowdown in growth over the mid 2000s (Kose *et al.* 2012). These facts cast some doubts on the strength of the bondage of globalization as they raise the question of possible growth divergence or so-called decoupling hypothesis between the emerging and developed countries. Intrinsically, it poses the question that we are familiar with i.e. what are the patterns of global business cycle convergence and synchronization in response to a rising globalization[5].

[5] Viewed through enhanced trade linkages, international financial integration, fiscal convergence, etc.

First, let we define the term (de)coupling. Coupling or sometimes called convergence implies that with higher levels of real and financial integration[6], business cycles should become more and more synchronized across countries over time. The on-going debate of whether the business cycles of emerging countries have become somewhat independent from the business cycles of advanced economies served us with the empirical possibilities that were theoretically argumentative. In that manner we are talking about divergence. The proponents of the opposite view have therefore posted the hypothesis of decoupling. Decoupling, in its "real" sense as defined by Cutrini and Galeazzi (2012), refers to low business cycle co-movement/synchronization or decreasing co-movement and synchronization over time between advanced and emerging countries. But given the fact that different countries in different regions have experienced growth, though in various forms, across the time, and that financial integration, stronger trade links, low exchange rate volatilities (Wälti 2009) and fiscal convergence (important for the EU), the growing divergences in business cycle between these two groups of countries is considered only a recent phenomenon[7]. Before we jump to any conclusion about the authenticity of the hypothesis, literature should be reviewed.

Before we get to papers dealing directly to the hypothesis of (de)coupling we have to mention some studies that dealt with this subject directly or indirectly and either on regional level (EU) or globally. These are: Artis and Zhang (1997, 1999), Frankel and Rose (1998), Inklaar and de Haan (2001), Rose and Engel (2002), Kose *et al.* (2003a, 2003b, 2008), Imbs (2004, 2006), Camacho *et al.* (2006), Fidrmuc and Korhonen (2006), Rozmahel (2009), Crowley and Schultz (2010), Gächter *et al.* (2013). Next, we must also stress that according to some scholars the notion of possible real decoupling had been completely misplaced, (see for example (Kappler 2008; Wälti 2009; Yeyati, Williams 2014; Kim *et al.* 2011; Willett *et al.* 2011; Siklos 2012; Cutrini, Galeazzi 2012), while other researchers contend that it was a reality in the past years and particularly before the global financial turmoil, e.g. Park and Shin (2009), Fidrmuc and Korhonen (2010), He and Liao (2012), Cutrini and Galeazzi (2012). Interesting literature on real decoupling that supports the hypothesis are Kose *et al.* (2008, 2012) with dynamic factor model, Fidrmuc and Korhonen (2010) with dynamic correlations, Park and Shin (2009) with cyclical measures based on growth rates and real output, He and Liao (2012) with multi-level structural factor model, etc. Bloningen *et al.* (2014) state that contrary to the result for cyclical fluctuations, they found co-movements of shocks to the trend components of real GDP is weaker among countries that trade more intensively with one another. Wang *et al.* (2015) by using spatial models for 187 countries found strong special co-movement of economic volatility. On the other hand, Willett *et al.* (2011) with correlation analysis, Wälti (2009) with synchronicity measures and Kim *et al.* (2011) with panel VAR model found evidence that enable them to refute this hypothesis. Wälti (2009) goes even further by provoking statement "The myth of decoupling". In line with his research he concluded that when considering emerging markets altogether, the decoupling hypothesis can be rejected for each geographical region. In addition, there is no general agreement that the introduction of Euro

[6] Some scholars distinguish real from financial decoupling as the latter is concentrated more on the financial divergence between developed and emerging countries based on the spill-overs in financial markets (see Kose *et al.* 2012; Helbling *et al.* 2007).

[7] In the narrow view it can be applied on the issue of raising synchronicity within the EU.

currency has increased the business cycle synchronicity in the Euro area. Interesting issue concerns the possible decoupling in comparison to the world strongest economy USA. Much of the literature was pointed towards that topic as well (Jean Louis, Simons 2014; Mink *et al.* 2007; Helbling *et al.* 2007). The methodological background of these researches would not be the subject of evaluation hence some of dilemmas have been analyzed here.

To highlight the issue, the increasing global linkage is also manifested in two stylized facts that have been marked by Gächter *et al.* (2013): (1) the volatility of the business cycle of the world economy and of the developed and emerging countries has (on average) fallen since the end of the 1970s, (2) synchronization of business cycles has increased globally. It is worth reminding that the theoretical literature does not provide conclusive indications on the effects that globalization (thought trade and financial linkages). An explanation for this decline in volatility can be found within improved institutional quality contributing to political stability, improved quality of monetary and fiscal management, changes in structural features – such as financial deepening, improved inventory management, the information technology revolution and more flexible labour and product markets – lower terms-of-trade volatility and an overall decline of the size of supply shocks, in particular oil-supply disruptions. Explanation for the rise in business cycle synchronicity can be found in the stronger trade and financial linkages of the global economy and the increase in the symmetry of macroeconomic shocks across countries (Gächter *et al.* 2013). Helbling *et al.* (2007) also concluded that during that past two decades common global factors have become somewhat less important drivers of national business cycle fluctuations. They suggested that the importance of regional factors among the highly integrated economies in North America, Western Europe, and emerging Asia appears to have increased. These contrasting developments reflect that global disturbances have become less frequent and smaller, while intra-regional trade and financial linkages have, in general, risen more rapidly than extra-regional ones. Namely, compared with the 1970s and early 1980s, the world economy may thus continue to see less synchronized international business cycles at the global level unless it is subjected to the common disturbances that were the hallmark of earlier episodes (Helbling *et al.* 2007). Euro area countries have displayed a drop in business cycle volatility during recent years as this feature can be linked to introduction of Euro currency but may equally well reflect other factors such as the global decline of business cycle volatility. *Ditto* it seems that the presence of (de)coupling tendencies is still unattached to either any theoretical concept or any firm empirical proofs.

The purpose of this section was to evaluate the relevance of the decoupling hypothesis. As we can see, much of the current debate on the decoupling hypothesis *de facto* lies on specific arguments as most of these arguments are theoretically ambiguous. Next, many academics suggest that this decoupling view is difficult to reconcile with significant empirical evidence supporting the hypothesis that international trade developments and financial integration process lead to greater business cycle convergence and synchronization. Cutrini and Galeazzi (2012) argue that despite extensive policy debates, little academic empirical evidence goes in favour of the validity of this argument. They state that cyclical decoupling is possible in the context of a generalized increasing long-run synchronization, however, business cycles across countries seem to be moving more closely over time, not less. Our conclusion about the ambiguity of (de)coupling hypothesis can be confirmed by their interpretation of the global

economy which is characterized by phases of coupling – decoupling – recoupling where group/regional factors fluctuate explaining the business cycles of different countries. Furthermore, phases of decoupling and recoupling of business cycle co-movements alter frequently, but a clear upward or downward trend is also barely observable in the average degree of business cycle synchronization in the Euro area in last twenty years (van Aarle *et al.* 2008). The conclusion about the ambiguity is congruent with the statement made by (Siklos 2012) that the notions of coupling or decoupling are, at best, misleading if not in overall wrong. Different economic factors and institutional frameworks, distinct from international trade and financial frameworks, are responsible for different economic performances in different times (such as in South East Asia, China and South Korea, Brazil and Argentina, some countries in the Caribbean area as well as in Europe's "periphery") where growth trends and fluctuations are just a part of common business cycle and these fluctuations do not represent the form of decoupling. Past episodes with large synchronised declines in global growth were characterized by common disturbances that were either truly global in nature (abrupt oil price changes), inflation volatility (Rizvi *et al.* 2014), were correlated across countries (disinflationary policies during the early 1980s), or involved global movements in asset prices (the synchronous equity price declines) (Dajčman 2014; Kašćelan *et al.* 2014; Peša, Festić 2014; Helbling *et al*. 2007). What is the future perspective of synchronization process is hard to tell, considering that business cycles tend to be more synchronized during a periods of economic downfalls but there is also no evidence that synchronicity will erode, at least as long as globalization has so resolute grasp. It is universally interesting to study geographical dispersion of economic forces and progress perspectives for they indicate the positions of political, economical and social power of the world. This is why the hypothesis of (de)coupling will always be relevant within global framework, yet at this time of history it seems to be less interesting!

Conclusions

Frequent business cycle reversals lead us to think if country can achieve macroeconomic stability and/or economic growth by fine-tuning it economic policies. Business cycle – economic growth relationship is rather hazy and thus subject to controversy. Recent stagnation and slump in developed and emerging countries has revived interest in research on the business cycles and effectiveness of measures of control it. Is it worth studying the long-term economic trends (i.e. growth) which are substantially influenced by the short-term fluctuations (i.e. business cycles) and, if so, how? Are these fluctuations subject to major secular change and how they should be analyzed? Does synchronicity and co-movement between individual countries and the region's reference cycle fluctuate substantially over time? Is there a growing convergence or divergence in business cycles between the groups of countries? These are the basic issues we have tried to address in this short review and discovered that the discussions on the cycle-growth nexus are far from over, revealing us some remarkable confrontations within theoretical as well as empirical domain.

First, various growth theories facilitate our better understanding of issues, at least at some aggregate level. This is especially true if we supplement the theories with empirically relevant evidence. In this sense the (dis)belief that there indeed exists a relationship between

the economic growth and business cycle, and their long-run convergence brings us to the first of three important deductions: the cycle-growth bond in the manner of trade-off is, in methodological perception, inconclusive (deduction 1). Moreover, if we observe empirical studies there is no strict evidence that would confront our hypothesis of inconclusiveness. Our conclusions are analogous to those of Fiaschi and Sordi (2003) that the determinants of the long-run economic growth are exogenous by construction, therefore neither the causality nor a correlation between growth and fluctuations can be compressively investigated. Next, measuring business cycles is critical in determining the stylised facts of the business cycle regarding aggregate macroeconomic behaviour over time. Although a cycle in economic activity is a stylized fact in macroeconomics, it is less clear as to when the growth dynamics coincides between countries/regions and when it is synchronized.

Second, there is a wide range of literature and research dealing with the issue of economic synchronicity – similarity – convergence, most of it with almost similar conclusions which gives us ground to conclude that the number of research on synchronization issue is over-exaggerated (deduction 2). Not to exaggerate, we however, conclude that synchronicity is a feature that is built on theoretical, as well as empirical grounds, so implications based on a set of real data will have to assure scientific and applicative basis for future research, mainly in some specific areas such as regional co-movements and similarities of industrial structure etc.

And finally, following the importance of globalization in promoting international economic linkages that heightened business cycle and growth correlations between the countries/regions and result in pervasive economic interrelationship we evaluated the hypothesis of so-called decoupling (deduction 3). Our conclusions about the ambiguity of (de)coupling hypothesis could be explained with relative amplitudes of the global economy which is characterised by phases of coupling – decoupling – recoupling where group/regional factors fluctuate continuously explaining the business cycles and growth perspectives of different countries.

Theories of business cycles should help us to understand salient characteristics of the observed non-seasonal fluctuations of the economy. Business cycles are persistent and pervasive, interact with the growth trends and show important regularities of co-movement, relative timing, and relative amplitude of different economic variables On the other hand, economic growth is a complex process and cannot be attributed to a single factor of observance such as business cycle approach hence our analysis is just a instrument of theoretical reasoning with firm grip on empirical circumstances pointed toward some questions that dwell current "growth economists". Our deductions made above are just mere observations and could/should be subject to revision in the future.

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