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On the transmission of economic fluctuations from the USA to EU-15 (1960–2011)☆

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ABSTRACT

Business cycle synchronization is a useful framework for analyzing the transmission of economic fluctuations. This work checks for synchronization between the USA and the EU-15 economies tracing the timing pattern and the magnitude of the synchronization. It identifies and estimates the link between GDP fluctuations in the USA and the EU-15. In particular, it shows that there is a strong relationship between GDP fluctuations in the USA and the EU-15 in the 1960–2011 time span, which fully captures the recent global recession, as well as other crises of the past five decades. Also, the Euro currency was introduced in 1999 so the period is broken down into two sub-periods (1960–1999 and 2000–2011) in order to examine its potential impact. Finally, the trends in the transmission processes and causalities are examined in accordance with earlier studies. The paper's main finding, which is of great interest, is that the economic fluctuations move from the US to the EU. In other words, output fluctuations in the US economy cause output fluctuations in the EU-15 economy. Also, regarding the timing pattern, the changes in the US GDP cycle are transmitted very rapidly to the EU-15 countries. Lastly, we find evidence of increased transmission of the economic fluctuations from the US to the EU-15 after the introduction of the Euro currency.

1. Introduction

Business cycle synchronization is a useful analytical framework for understanding economic fluctuations and the transmission of shocks. In this context, as Schneider and Fenz (2008, p. 2) emphatically

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argued: "research interest focuses on the co-movement of fluctuations in the Euro area and the US." This work contributes to the literature in the following ways: First, it introduces the relevant methodological framework which combines conventional cross correlation, cointegration, Granger causality, Error Correction Model (ECM) and VAR. Based on these quantitative approaches the paper investigates the fluctuations' synchronization and convergence between the USA and the EU-15, with respect to both timing patterns and magnitude. Second, we offer a complete statistical analysis by country and for the EU as a whole for the time period of interest, that the previous works did not have. Third, the paper uses a wide dataset to take into account the recent period which captures the current economic and financial crisis (1960–2011) and it is the first, to the best of our knowledge, that breaks the 1960–2011 time span down into two relevant sub-periods based on the introduction of the common currency (i.e. 1960–1999, 2000–2011). The remainder of the paper is structured as follows: Section 2 provides a brief review of the literature; Section 3 sets out the methodological framework; Section 4 presents and analyzes the empirical results; Section 5 concludes.

2. Background literature

The relationship of the various EU-15 countries with the US, in the context of synchronization, could shed some light on the issue of increasing integration which is a hot topic in the agenda of economists around the globe. On the one hand, Krugman, 1991 argued that increasing integration leads to regional concentration of industrial activities which, in turn, leads to sector- (or even region-) specific shocks, thereby increasing the likelihood of asymmetric shocks and diverging business cycles. In this spirit, Kalemli-Ozcan, Sorensen, and Yosha (2001) argued that increased economic integration leads to better income insurance through greater capital integration which, in turn, leads to more specialized production structures and an increase in trade and therefore less synchronized business cycles. On the other hand, there is the view expressed, among others, by Frankel and Rose (1998) and Coe and Helpman (1995), suggesting that the removal of trade barriers leads to more trade such that demand shocks are more easily transmitted across countries. In this approach, economic integration leads to more symmetric fluctuations which, in turn, lead to more synchronized business cycles. In a similar vein, Inklaar, Jong-A-Pin, and De Haan (2008) argued that as economic policies in the Euro area are likely to become even more similar, business cycle synchronization will increase. See Trichet (2001).

In the meantime, a vast literature exists on the transmission of US shocks to Europe. The IMF (2007) argued that the spillovers from the US have considerable effects on the rest of the world. In the same spirit, Osborn, Perez, and Sensier (2005) found that the US economy leads the European economies. Also, Artis, Galvao, and Marcellino (2003) provided evidence that, on average, 2/3 of the US shocks are transmitted to Europe. According to Canova and Marrinan (1998), Kwark (1999), Dassel (2002) and Eickmeier (2007) most of the US shocks are transmitted to the German economy. Pesaran, Schuermann, and Weiner, (2001) and Neri and Nobili (2006) found that EMU output is negatively affected by a decrease in the US interest rates in the short run, though positively affected in the medium run. Also, monetary policy shocks in the US are found to have ambiguous effects on the euro area. In conclusion, the US economy is found to be the locomotive of the world economy and thus of the European economy.

3. Methodology

We regard business cycles as fluctuations around a trend, the so-called "deviation cycles" (Lucas, 1977). See also Papageorgiou, Michaelides, and Milios (2011). First, we examine the stationarity characteristics of each time series. Here, we use the popular Augmented Dickey–Fuller methodology (ADF) (Dickey & Fuller, 1979).[1]

[1] Alternatively, the test of Zivot and Andrews (1992) could be used or some other unit root tests such as the IPS test (Im, Pesaran, & Shin, 1997), the MW test (Maddala & Wu, 1999), the Choi test (Choi, 2001), etc. See, for instance, Montoya and De Haan (2008), Danthine (1989), Danthine and Donaldson (1993), (Blackburn and Ravn, 1992), Backus and Kehoe (1992),