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Business cycle synchronisation in East Asia☆

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ABSTRACT

Against the background of the rapid inter- and intra-regional integration of East Asia, we examine the extent and nature of synchronisation of business cycles in the region. We estimate a dynamic common factor model for output growth of 10 East Asian countries. A significant common factor is shared by all Asian countries considered, except China and Japan. The degree of synchronisation has fluctuated over time, with an upward trend particularly evident for the newly industrialised economies. Synchronisation appears to mainly reflect strong export synchronisation, rather than common consumption or investment dynamics. A number of external factors, such as the oil price and the JPY–USD exchange rate, appear to play a role in synchronising activity.

1. Introduction

In recent decades, East Asia has assumed a more prominent global role and has become increasingly integrated with the world economy. At the same time, economic integration within East Asia has also progressed at an impressive speed. This is evidenced, for example, by the rapid increase in intra-regional trade flows, which partly reflect the increasing internationalisation of the production process.[1] In particular, China has emerged as a major assembly and processing centre, thereby increasing intra-regional trade and financial flows, while simultaneously strengthening the links between countries within the region. Another important feature of East Asian trade integration has been a significant concentration on intra-industry trade, which has become particularly relevant during the last decade. This reflects to a large extent the increasing distribution of the production chain across different countries in the region according to their respective comparative advantage in different stages of the production process (see Isogai, Morishita, & Rüffer, 2002). This process of increasing inter- and intra-regional integration is likely to have an effect on the growth dynamics of the East Asian region and, in particular, on the degree of synchronisation within the region and between the region and the rest of the world.

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[1] As shown by Isogai and Shibanuma (2000) intra-regional trade as a share of GDP has increased continuously from around 7% in the period 1985–1987 to almost 14% in 1995–1998. This trend has continued, reaching 16% in the period 1999–2002 (authors' calculations). While starting out at a lower level in the mid-1980s, Asia has now overtaken the euro area with respect to the ratio of intra-regional trade to GDP. For NAFTA and Mercosur the ratio of intra-regional trade to GDP is below 5% in the period 1990–1992.

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The issue of synchronisation is particularly relevant in the context of ongoing discussions about the possibility of greater monetary co-operation within the East Asian region – possibly culminating in a full-fledged monetary union with a common currency – which have been revived in the wake of the Asian crisis. Considering the "optimal currency area" argument of Mundell (1961) business cycle synchronisation is a crucial criterion to be considered.

From a theoretical perspective, the effect of greater trade integration on business cycle synchronisation is ambiguous. On the one hand greater trade integration should lead to stronger spill-overs of demand shocks from one country to another, thereby increasing synchronisation (e.g. Frankel & Rose, 1998). On the other hand, trade integration may lead to specialisation in production, leading to differences in the exposure to industry-specific shocks in different countries and, thus, to a reduction in synchronisation (e.g. Krugman, 1993; Kose & Yi, 2002). The specialisation argument is particularly relevant in the case of inter-industry trade, but should play less of a role in the case of intra-industry trade, as specialisation in the latter case occurs within the same industry (Frankel & Rose, 1998).[2] As a consequence, the ambiguity of the synchronisation effect may be stronger for developing countries and for industrial-developing country pairs than just for industrial countries given the differences in trade structures (see Calderón, Chong, & Stein, 2007).[3]

Given the ambiguity of economic theory on this issue, a large empirical literature has developed to study the effect of trade and financial linkages on business cycle synchronisation. Overall these studies tend to provide evidence of a positive link between economic integration and synchronisation, especially for advanced economies (e.g. Clark & von Wincoop, 2001; Frankel & Rose, 1998; Imbs, 2004). However, for emerging and developing economies the evidence appears to be more scant and somewhat more mixed (e.g. Calderón et al., 2007). Although East Asia has been one of the most dynamic regions in terms of increasing inter- and intra-regional integration, it has until recently received relatively limited attention in the synchronisation literature. The existing studies generally find a positive relationship between trade linkages and synchronisation for the Asian region, in line with the relatively high share of intra-industry trade within the region (e.g. Choe, 2001; Rana, 2007; Shin & Sohn, 2006). In fact, Shin and Wang (2003, 2004) find that the strength of intra-industry trade links between Korea and its individual trading partners is the most important determinant of output correlation with the trading partner and that intra-industry trade is the major channel through which the business cycles of East Asian economies are synchronised. In contrast to these studies, Kumakura (2006) finds that similarities in the production structure are a much more important explanatory variable for bilateral growth synchronisation than bilateral trade links.

Using principal components analysis, Selover (1999) finds evidence for a shared business cycle among the Association of Southeast Asian Nations (ASEAN) countries. However, results from VAR estimations trying to capture the interaction between pairs of countries provide only weak evidence of business cycle transmission between ASEAN countries. In a related paper, Selover (2004) focuses more narrowly on the economic links between Japan and Korea and finds evidence of only moderate synchronisation in activity, which however has gained somewhat in strength over time. Applying a Markov-switching VAR framework, Girardin (2002) finds evidence for a common growth cycle among some Asian countries. Rather than focusing on bilateral relationships between countries, as many of the studies do, we are more interested in taking a multilateral approach and assessing directly whether and to what extent activity in Asia is driven by a shared business cycle. For that purpose we construct a parametric dynamic common factor model to extract common growth features from GDP data and their components. In addition, we provide some suggestive evidence regarding the factors underlying this co-movement.

The main contribution of this paper to the existing literature is to use a parametric dynamic common factor model to examine the business cycle synchronisation in East Asia and its evolution over time. One of the key advantages of this methodology is that, whereas many previous studies of East Asian business cycle synchronisation have concentrated on bilateral co-movement between individual country pairs (e.g. Shin & Sohn, 2006; Choe, 2001; Crosby, 2003; Rana, 2007), the common factor is essentially a multilateral approach able to capture synchronisation at a region-wide level. In addition, the dynamic factor model also allows a better characterisation of the dynamic dimension of co-movement relative to a static bilateral correlation analysis.[4]

The main findings of the analysis can be summarised as follows: a single common dynamic factor captures a substantial part of the output dynamics of Asian countries – with the exception of China and Japan. Furthermore, the degree of synchronisation has increased over the past two decades in particular for the newly industrialised economies (NIEs), with the Asian crisis explaining only part of this increase. Evidence for synchronisation is particularly strong for exports, while synchronisation of consumption and investment dynamics across countries appears to be much weaker. Looking to exports Japan and China present a significant co-movement with the other East Asian countries. In addition, the analysis of possible

[2] The discussion on the synchronising effect of trade integration is closely related to the optimal currency area discussion. While it is generally accepted that a monetary union leads to an increase in trade among the members of the union, it is less clear whether this implies that the monetary union thereby moves *ex post* closer to satisfying the conditions for an optimal currency area or not, which depends crucially on the interrelationship between trade and synchronisation.

[3] A similar argument as for trade integration regarding the effect on synchronisation can be made about financial integration. As financial integration allows greater risk sharing between countries, it permits greater specialisation of a country's production structure (e.g. Kalemli-Ozcan, Sorensen, & Yosha, 2001). In addition, greater economic integration may also lead to higher synchronisation through increased knowledge spillovers (e.g. Coe & Helpman, 1995) or through increased policy similarities (e.g. Frankel & Rose, 1998).

[4] In principle, a further advantage derives from the fact that the model is parametric and thus allows the explicit modelling of inter- and intra-regional spill-over effects and their separation from true common shocks. In the case of the Asian countries, the limited availability of long samples puts restrictions on the precise estimation of highly parameterised models, as in the case of cross-country spill-over effects.