

# Identifying shocks in regionally integrated East Asian economies with structural VAR and block exogeneity

Kiyotaka Sato<sup>a</sup>, Zhaoyong Zhang<sup>b,\*</sup>, Michael McAleer<sup>c,d,e</sup>

<sup>a</sup> Faculty of Economics, Yokohama National University, Japan

<sup>b</sup> School of Accounting, Finance and Economics, Edith Cowan University, 270 Joondalup Drive, Joondalup, Perth, WA 6027, Australia

<sup>c</sup> Econometric Institute, Erasmus School of Economics, Erasmus University Rotterdam, The Netherlands

<sup>d</sup> Tinbergen Institute, The Netherlands

<sup>e</sup> Department of Economics and Finance, University of Canterbury, New Zealand

Received 1 December 2009; received in revised form 30 May 2010; accepted 3 June 2010

Available online 23 June 2010

## Abstract

In this paper we use a structural VAR model with block exogeneity to investigate if external shocks originating from the USA played a dominant role in influencing the macroeconomic fluctuations in East Asia during the period 1978–2007. The empirical results show a dynamic effect of external shocks, implying that, even though regional integration appears to be deepening and accelerating, especially after the recent global financial crisis, the influence of US shocks on real output fluctuations in the East Asian region is still very strong. The effects of Chinese shocks show an increasing trend over time, but the impacts are still small and not comparable with those of US shocks. The world oil price shock has become increasingly important in influencing the stability of real output growth in the region. The results from variance decomposition and impulse response analysis confirm the findings. Even though Japanese firms have established production networks in East Asia through trade and investment, and China has also grown rapidly and become a key regional country, the results suggest that US influence in the region is still asymmetric and strong. Therefore, it is difficult to conclude that shocks to the East Asian economies have become more regionally oriented.

© 2010 IMACS. Published by Elsevier B.V. All rights reserved.

*JEL classification:* F33; F36; F41

*Keywords:* Structural vector autoregression; Block exogeneity; Monetary union; External shock; East Asia

## 1. Introduction

East Asia has enjoyed a remarkable record of high and sustained economic growth over three decades from 1965 to the early 1990s. Their ability to achieve speedy developments with equity has intrigued many economists who attempted to understand the drivers of economic growth. Most of this miraculous growth is believed to be due to a combination of fundamentally sound development policies, tailored interventions, and an unusually rapid accumulation of physical and human capital, as well as rapid intra-regional trade integration. Recovering from a severe economic

\* Corresponding author. Tel.: +61 8 63045266; fax: +61 8 63045271.

E-mail address: [zhaoyong.zhang@ecu.edu.au](mailto:zhaoyong.zhang@ecu.edu.au) (Z. Zhang).