Foreign direct investment and business cycle co-movements: The panel data evidence

Chih-Chiang Hsu, Jyun-Yi Wu, Ruey Yau *

Department of Economics, National Central University, Taoyuan 32001, Taiwan

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ABSTRACT

The previous literature has largely overlooked the possible channels through which foreign direct investment (FDI) might influence business cycle synchronization. In this study we analyze the linkages that exist among FDI, trade and industrial dissimilarity in relation to business cycle co-movements using a panel data set taken from 77 pairs of developed countries. The error component three-stage least squares (EC3SLS) estimates from a simultaneous equations model with panel data are shown to be superior to the estimates obtained from single equation models or simultaneous equations models with cross-sectional data. Our results indicate that FDI serves as a channel of international business cycle transmission that is equally important as the channels of trade and monetary policy. On the contrary, industrial dissimilarity is identified as having an indirect impact on the business cycle correlation through trade and FDI. Furthermore, our findings suggest that in our sample FDI is of the horizontal type and tends to substitute for trade.

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1. Introduction

The channels of international business cycle co-movements have been debated in the literature, with this debate focusing on how such co-movements have been propagated and transmitted from one country to another. There are several possible channels, the most prominent channel being trade. Frankel and Rose (1998) state that countries with closer trade links tend to have more tightly correlated business cycles. Baxter and Kouparitsas (2005) also arrive at similar conclusions whereby intense bilateral trade tends to result in a high degree of synchronization among business cycles. By contrast, Gruben et al. (2002) and Inklaar et al. (2008) find that the trade effect is smaller than previously reported. Crosby (2003) even states that trade does not explain the correlation. Another transmission channel is dissimilarity in industrial structures. Imbs (2004) points out that industrial dissimilarity (or specialization) patterns have sizable effects on business cycle co-movements. However, Otto et al. (2001) and Baxter and Kouparitsas (2005) do not confirm this result. More recently, the role of financial integration in business cycle synchronization has been stressed by Imbs (2004, 2006). He finds that economic regions with strong financial linkages are more synchronized, an argument that is however not supported by Inklaar et al. (2008). Other possible channels can be summarized as follows: (i) monetary integration (Schiavo, 2008); (ii) economic integration (Kalemli-Ozcan et al., 2001); (iii) similarity of fiscal policies (Clark and van Wincoop, 2001); (iv) exchange rate volatility (Inklaar et al., 2008); and others: see de Haan et al. (2008) for a recent survey.

In this paper we focus on the role of foreign direct investment (FDI) in technology diffusion and financial investment and argue that FDI might be another important channel for the international transmission of disturbances. FDI is a category of

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* Corresponding author. Tel.: +886 03 4227151; fax: +886 03 4222876.
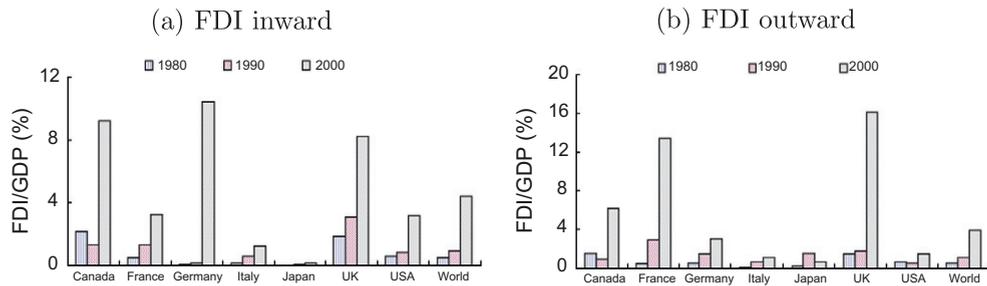 *E-mail address:* ryau@mgt.ncu.edu.tw (R. Yau).

Fig. 1. FDI flows to GDP ratio.

cross-border investment made by a resident in one economy (source economy) to acquire a lasting interest in an enterprise operating in another economy (host economy).[1] FDI has increased dramatically since the 1980s. Fig. 1 shows the FDI inflows and outflows as a share of GDP among the G7 countries (Canada, France, Germany, Italy, Japan, the UK and the US) and the world in different years.[2] For the world, we find that inward FDI as a share of GDP increased from 0.50% in 1980 to 4.39% in 2000. The share of GDP accounted for by outward FDI for the world increased from 0.51% in 1980 to 3.53% in 2000. For the G7 countries, both inward and outward of FDI have grown more than five times over these two decades. Although Japan's inward and outward FDI were very low in 2000, being only 0.17% and 0.67%, respectively, its FDI is in a rising trend and could play an important role in cross-border business cycle co-movements. In contrast to FDI, exports and imports as a share of GDP are more stable, but trade (imports+exports) still accounts for a large share of GDP. This is shown in Fig. 2.

Apparently, the role of FDI has become increasingly important during this period. However, only a few papers indicate that the business cycles are more highly correlated for those countries which are more involved in bilateral FDI. Jansen and Stockman (2004) use aggregated data on bilateral FDI among OECD countries and suggest that countries with tighter FDI linkages also have more correlated business cycles. Similar results are found by Otto et al. (2001), but they state that the effect of FDI is smaller than that of bilateral trade. Levy Yeyati et al. (2007) find FDI flows to be countercyclical with the business cycle of the source country.

How does bilateral FDI contribute to the business cycle synchronization? Otto et al. (2001) and Jansen and Stockman (2004) suggest some possible channels. We summarize them below. First, if foreign firms introduce new processes into the domestic market, then domestic firms may benefit from the accelerated diffusion of new technology. Second, if a deterioration in the economic conditions in the foreign investor's home country weakens the financial health of the parent companies, inward FDI may lead to a cutback in hiring and a decrease in the wage and investment in the host countries. Hence, international rent sharing within multinational companies may cause the spread of local macroeconomic shocks from one country to another. Third, in an outward FDI position, unfavorable disturbances in the host foreign countries may reduce the net worth of the domestic investing firms, which may further hurt domestic investment via the balance sheet channel and the stock market channel. It is also likely to induce an adverse impact on domestic consumption via the wealth effect. Fourth, if capital is relatively mobile between two countries, then a change in the saving and investment decision in one country is likely to affect the price and availability of financial assets. This will lead to more closely synchronized business cycles. These outlined channels of business cycle transmission through FDI are related to the notions of technology spillover, activities of multinationals, and financial integration in a more general sense.

In this study, we argue that there has been a trend in the past two decades whereby firms have substituted FDI for trades in their decision to serve foreign markets.[3] In the existing literature, the interaction between trades and specialization patterns and their linkages with business cycle synchronization have been investigated empirically.[4] Given the fact that FDI's role is increasing, an interesting question that remains to be explored is whether the shift in trades and FDI composition will change the interaction patterns. The purpose of this paper is to investigate the impact of bilateral FDI, trade and industrial dissimilarity on business cycle correlation in a simultaneous equations system. Our empirical methodology is similar in spirit to that introduced in Imbs (2004), but our approach diverges from his in two respects. First, unlike most empirical studies on synchronization that use cross-sectional data, this paper estimates a simultaneous equations system using a panel data set of 77 country pairs. Estimating the model with panel data allows us to take into account how FDI development over time for a given country pair may have affected synchronization and other endogenous variables in the system. Any unobserved country pair-specific effect can be controlled for in a panel estimation, while it could lead to biased and inconsistent estimates in a pure cross-sectional regression. The second major difference between this paper and Imbs (2004) is the inclusion of the FDI variable in our empirical model. FDI cannot only transmit technological shocks but also link itself to the international financial market through

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[1] See OECD (2008).

[2] Data are obtained from the UNCTAD (2008) World Investment Report.

[3] According to Helpman et al. (2004), larger transport costs and small plant-level returns to scale are potential explanations for such a trend. This is because exporting involves lower fixed costs while FDI entails lower variable costs.

[4] For instance, Frankel and Rose (1998) and Otto et al. (2001) use the single equation method to estimate the relationship, whereas Imbs (2004), de Haan et al. (2008) and Schiavo (2008) adopt the simultaneous equations framework.