

〔研究ノート〕

Foreign Direct Investment and Cross-Country Business Cycle in the EU

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Abstract

This paper analyzes the relationship between foreign direct investment (FDI) and cross-country business cycle in the European Union (EU). Countries that have intensive relationships in FDI have recently synchronized their business cycles. Moreover, greater FDI linkages are associated with a greater vulnerability from other countries whereas trade linkages do not incur the same risks. FDI will be an important key element in the success of an integrated market and for introducing the euro.

Keywords ; business cycle, FDI

JEL classification : E32, F21

Introduction

The EU was established in 1993. Since then, market integration has increased. Market obstacles of promoting trade and investment have been almost eliminated. Foreign direct investment (FDI) has increased rapidly as market integration has increased. The increase

in FDI expanded after the euro was introduced in 1999. The EU economy has been in relatively in good condition, so more economic activity, including FDI has been taken place. ⁽¹⁾

The process of European economic and political integration has been ongoing and has extended more recently to the Central and Eastern Economies (CEEs). In 2004, 10 CEE countries joined the EU after satisfying severe conditions. All of them were admitted to the World Trade Organization (WTO), and some have been already been admitted to the Organization for Economic Cooperation and Development (OECD) and NATO. This integration has been facilitated by economic and political reforms that have led to the institutional convergence of the CEE countries.

Additionally, business cycle behavior may have been synchronized since the advent of economic interdependence in the 1990s. In general, the degree of output comovement in the business cycle reflects both the nature of the shocks that have occurred and the degree of economic interdependence. Output comovement will correlate to a greater degree if common shocks happen to be predominant; inversely, they will be more asymmetric if idiosyncratic shocks predominate, as indicated by traditional “optimal currency area (OCA)” theory. Because of strong economic relations among economies, country-specific shocks may transmit to other countries, enhancing output comovement indirectly (Jansen and Stockman, 2004).

The major economic difference between CEE countries and the EU, and among CEEs countries, is their level of economic development, which still varies greatly. This has resulted not only in limited industrialization but also in less developed physical and institutional infrastructures and weaker entrepreneurial traditions in almost all CEE countries, which have remained poor and underdeveloped relative to EU and other developed countries. However, FDI has grown rapidly and its economic linkage may have had a cross-country business cycle different from the past and from the former EU countries.

Existing research reveals two common characteristics. One type is focused on “supply side” effects, for example, firm-level data and technology and management techniques for analyzing market integration. The other type focuses on international trade linkage. However, this paper analyzes another effect, namely the role played by FDI in the transmission of economic shocks across borders. Using aggregate data, this paper examines to what extent the expansion of FDI and the internationalization of production is related to synchronized business cycles. The countries analyzed are not limited to the 15 EU countries but includes the 10 new entrant countries.

This paper first analyzes the relation between FDI and its transmission mechanism then illustrates the relationships of FDI and business cycle linkage.

FDI and the Channel for International Transmission

FDI consists of investments made by a resident of one country in a company located in another country with the objective of making a profit. Industrial countries generally act both as host to FDI in their own country and as participant in investments in other countries. A country's inward FDI consists of the hosted FDI projects, whereas the outward FDI position includes the FDI projects owned abroad. Both inward and outward FDI may render the domestic economy sensitive to economic “disturbances” or “shock” abroad.

With inward FDI, the host country takes the risk that foreign investors may withdraw their money and businesses. A deterioration of the economic conditions in the foreign investor's home country may weaken the financial stance of the parent country. That company may cut employment, wages, and investment in the host countries, which will affect the countries as a whole. Because of internationalization and interexchange among countries, especially in the EU, domestic wages and employment may reflect international factors of other countries in addition to domestic local economic

conditions. ⁽²⁾

FDI also incurs macroeconomic risks. These risks are mainly related to the outward FDI position. Domestic companies face the consequences of disturbances abroad on the financial position of the investing firms. Unfavorable deteriorations in the host countries may reduce the investment projects abroad and may thus incur a serious risk in terms of the value of domestic firms.

A fall in stock prices, at home and abroad, may adversely affect domestic consumption via wealth effects, balance sheet effects, and confidence effects. ⁽³⁾

In addition to inward and outward FDI, “horizontal” and “vertical” FDI are important. Horizontal FDI is accelerated by the desire to be near to customers' markets due to high trading costs. The firm runs similar operations at different locations, for example, manufacturing and selling of like products in the same country or neighboring countries. This type of FDI replaces international trade relationships. Vertical FDI allows firms to take advantage of international differences in factor mobility, prices, and mobility. This type of FDI occurs with international trade of both intermediate and final goods. Most empirical analysis tends to conclude that most real-world FDI is horizontal, especially in industrialized countries (Carr, Markusen, and Maskus, 2001). This distinction may be very important in the analysis of European countries including the new 10 entrants. There are some significant differences between the 15 EU countries and 10 new entrants.

Finally, the volume of FDI in the EU has grown rapidly across the EU (EC) since the 1980s. Since 1995, FDI has accelerated markedly, ⁽⁴⁾ increasing faster than international trade. Moreover, the 15 EU countries contributed much FDI to the 10 new entrants before they could participate in the EU. Skilled workers, low wages, and ample natural resources have been attracted much attention from developed countries all over the world, especially to the 15 EU countries.

FDI Relationships and Business Cycle Linkage

Basic Analysis

This section investigates whether there is a positive relationship between the FDI positions and the degree of business cycle comovement among the EU countries including the 10 new entrants. This paper analyzes two cases:(1) large countries in the EU (France, Germany, Italy, Spain, and U. K.) and other EU participants that joined the EU in 1993; and (2) large countries listed above and the 10 new EU countries that joined the EU in 2004.

Because there is no established definition of international output comovement, this section uses two measures of the degree of output comovement. The first is the correlation of the quarterly growth rates of real gross domestic product (GDP). The second is the correlation of the quarterly output gaps, the log of difference between actual real GDP, and its trend (using the Hodrick-Prescott filter).

The estimation method takes into account of the time variation. Its mix and size of disturbance may obscure the relationships between FDI and output correlation as suggested by Jansen and Stockman (2004). Due to the lack of the data, the pooled cross-section regression is estimated. The estimated equation is as follows.

$$\rho(i, j) = \alpha_0 + \alpha_1 \text{Dummy}_1 + \alpha_2 \text{Dummy}_2 + \alpha_3 \text{Dummy}_3 + \alpha_4 \text{Dummy}_4 + \beta \text{FDI}(i, j) \quad (1)$$

where D_i indicates country-specific dummy variables, which are one if the observation refers to the reporting country i and zero otherwise. $\rho(i, j)$ is the measure of business cycle comovement between reporting country i and partner country j over a certain span. $\text{FDI}(i, j)$ is the average strength of the corresponding FDI link, calculated as FDI volume/GDP. Equation (1) assumes that the intercept differs across countries but that β is the same for each country. The empirical method is weighted least squares (WLS). The sample period is from 1990-1998 and 1999-2003. In 1999, the euro was introduced and market integration in the EU has grown rapidly. Table 1 provides the results.

Table 1

Pooled Cross-section Regression of Output Comovement on FDI

<EU 15>				
	Estimate	t value	P value	P value
	<i>beta</i>		<i>alpha</i>	<i>beta</i>
Quarterly growth rate of real GDP				
1990-1998	0.024	3.99	0.31	0.48
1999-2003	0.019	4.05	0.12	0.66
Quarterly output gap				
1990-1998	0.022	3.76	0.22	0.62
1999-2003	0.017	3.88	0.08	0.69
<EU New 10>				
	Estimate	t value	P value	Pvalue
	<i>beta</i>		<i>alpha</i>	<i>beta</i>
Quarterly growth rate of real GDP				
1990-1998	0.015	3.43	0.37	0.50
1999-2003	0.008	3.57	0.15	0.78
Quarterly output gap				
1990-1998	0.014	3.65	0.26	0.74
1999-2003	0.015	3.89	0.14	0.80

The results show evidence supporting a link between bilateral FDI and output comovement. Correlations of growth rates are significantly higher for economies that have intensive FDI relationships than for economies that have less intensive FDI relationships. Moreover, the positive relationships of FDI and output comovement are more apparent in recent years.

For the 10 new entrant countries, FDI relationships are a little bit higher than for the 15 countries. Recent increase is also large. FDI plays important role in synchronizing economies with the 15 countries.

The evidence shown so far concentrates on FDI links among countries. Economies are, in general, also linked by international trade as explained in the previous section. It is likely that countries that invest a lot will tend to trade a lot with each other. However, investment and trade ties may differ depending on whether the FDI is horizontal or vertical.

The relationship between international trade and output comovement is estimated along the same lines as an analysis for FDI. Equation (2) is regressed.

$$\rho(i, j) = \alpha_0 + \alpha_1 \text{Dummy}_1 + \alpha_2 \text{Dummy}_2 + \alpha_3 \text{Dummy}_3 + \alpha_4 \text{Dummy}_4 + \beta \text{TRADE}(i, j) \quad (2)$$

$\text{TRADE}(i, j)$ measures the openness of the economy between reporting country i and partner country j over a certain time span (trade volume / GDP). The basic data are the annual exports and imports of country i relating to j . This analysis assumes that only exports are a source of vulnerability. The empirical method is WLS. Table 2 provides the results.

In general, estimates of beta are also significant. More intensive foreign trade relationships go hand in hand with more synchronized business cycles.⁽⁵⁾ However, it is interesting to note that international trade linkages have had weak and gradual effects. Compared to the 15 countries, the 10 new entrants have weaker effects on output comovement. Two important things should be noted. One is the nature of international trade. Vertical trade between large EU countries and new EU countries may still exist because of the substitution of FDI for trade. The other is that from 1990 to 1994, when Germany ran current account deficits in the aftermath of reunification and Japan adjusted to the collapse pattern of the asset markets, trade pattern linkage was strongly linked to

the correlation pattern of GDP growth rates. For the most recent period, the influence of trade ties is more muted compared to that measured over the whole sample. ⁽⁶⁾

Table 2

Pooled Cross-section Regression of Output Comovement on International Trade

<EU15>				
	Estimate beta	t value	P value <i>alpha</i>	P value <i>beta</i>
Quarterly growth rate of real GDP				
1990-1998	0.020	2.79	0.37	0.32
1999-2003	0.022	3.84	0.33	0.34
Quarterly output gap				
1990-1998	0.022	3.77	0.21	0.55
1999-2003	0.018	3.88	0.08	0.49
<EU New 10>				
	Estimate beta	t value	P value alpha	P value beta
Quarterly growth rate of real GDP				
1990-1998	0.037	3.52	0.37	0.29
1999-2003	0.012	4.00	0.32	0.22
Quarterly output gap				
1990-1998	0.021	4.44	0.24	0.39
1999-2003	0.014	4.61	0.20	0.37

Lagged Effects on Comovement

The discussion has concentrated on cross-country variations in contemporaneous correlations. This may be insufficient because of the possibility of some lags in international event effects. Time lags and distances, though shrinking rapidly, still exist. Distances between countries are sometimes great in the EU. This section uses the Granger causality test. First, the following is estimated for various time spans.

$$y(i,t) = \alpha + \sum_{l=1}^m \lambda_l y(i,t-l) + \sum_{l=1}^m \lambda_{l1} y(j,t-l) \quad (3)$$

where y expresses the growth rate of real GDP or the output gap and m stands for the maximum lag with which $y(j)$ affects $y(i)$. i and j stand for country. The Granger causality test from $y(j)$ to $y(i)$ can work if some of the λ 's are nonzero. In this case of nonzero, country j influences on country i with (a) lag (s). The sum of the coefficient λ_l means the lagged transmission from country j to country i . Preliminary tests indicate that the maximum lag length m in equation (3) for most countries equals 1 for output growth rates and 2 for output gaps. This analysis is restricted to lagged effects with m set to either 1 or 2.

Table 3 shows the empirical results for the case in which both FDI and international trade are added the same equation.

Table 3 shows that a country's vulnerability to past disturbances in partner economies is positively related to the size of FDI. However, the effect is not large. The spillover effect from FDI to business cycles may be rapid. The analysis reveals weaker effects for foreign trade than for FDI linkages. The phenomenon is stronger in the EU 15. FDI has played important roles in synchronized economic activity.

Table 3

Pooled Cross-regression of Lagged Output Effects on FDI and Foreign Trade

<EU15>

	Lag=1				Lag=2			
	FDI	t value	Trade	t value	FDI	t value	Trade	t value
Quarterly growth rate of real GDP								
1990-1998	0.013	2.44	0.012	2.01	0.011	1.29	0.009	1.01
1999-2003	0.010	1.56	0.014	1.45	0.009	1.18	0.010	0.98
Output gap								
1990-1998	0.017	2.89	0.013	2.43	0.012	2.13	0.013	1.21
1999-2003	0.012	1.88	0.017	1.76	0.007	0.99	0.008	0.64

<EU New 10>

	Lag=1				Lag=2			
	FDI	t value	Trade	t value	FDI	t value	Trade	t value
Quarterly growth rate of real GDP								
1990-1998	0.019	3.31	0.010	1.88	0.0127	1.87	0.005	0.95
1999-2003	0.017	2.19	0.010	1.43	0.010	1.23	0.009	1.04
Output gap								
1990-1998	0.023	3.53	0.011	2.23	0.017	2.20	0.011	1.09
1999-2003	0.019	1.99	0.017	1.56	0.008	1.07	0.007	0.60

Conclusion

This paper examines to what extent the rapid expansion of FDI and international trade is related to the phenomenon of synchronized business cycles. Larger investments make the domestic economy more susceptible to economic disturbances abroad. Taking into account both FDI and international trade, FDI is an important channel through which economies may affect each other in a significant fashion, especially for the 10 entrant countries. Moreover, foreign disturbances may influence the domestic economy for a shorter period when relayed through the FDI channel.

The trend toward greater economic interdependence through FDI implies an underlying tendency for business cycles to display a less synchronized behavior than in the past. However, FDI has become an important channel for the international transmission of disturbances.

Endnotes

- (1) The rise in international economic interdependence in the EU has occurred in financial and capital markets, such as equity, bonds, and cross-border credit relations.
- (2) Budd and Slaughter (2000) stated that foreign affiliate wages are positively related to parent profit per worker for a sample of European firms.
- (3) For the relationship between investments and stock in Europe, see Barrell and Sakellaris (1997). Jansen and Nahuis (2003) presented evidence of a link between stock market and consumer confidence in Europe.
- (4) Compared to Japanese trends, this movement is remarkable. Japanese corporations have reduced their presence abroad since the late 1990s. For FDI's contribution to European economy, see Kurihara (2002), for example.
- (5) The results are similar to Frankel and Rose (1998).
- (6) The results of both FDI relationships and trade linkages included in the equation suggest that economic relationships do not matter for business cycle comovement.

(7) Higher degree of output comovement in recent years has partly been driven by common shocks, such as large changes in crude oil prices, the rise and fall of the information technology boom, and restrictive monetary policies (Peersman, 2002).

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