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Exchange rate movements and foreign direct investment (FDI): Japanese investment in Asia, 1987–2008☆

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ABSTRACT

The paper estimates the impact of exchange rate movements on foreign direct investment (FDI). By using the panel data of Japanese FDI flows to nine dynamic Asian economies during 1987–2008, the paper finds that (i) FDI declined with a depreciation of the yen against host country currencies; (ii) it increased with exchange rate volatility; and (iii) it was little affected by the Asian financial crisis, especially when disguised financial flows were removed from the data. A novel result concerns the negative response of FDI to the third moment of monthly exchange rate changes: the volume of FDI was smaller when the distribution was positively skewed (i.e., when the yen was biased towards relatively large depreciation shocks). If skewness proxies for expected mean-reverting changes, this supports the idea that source country investors care about the future stream of revenues and returns denominated in their own currency. These results are robust, with other standard control variables having statistically significant coefficients with expected signs.

1. Introduction

The paper estimates the impact of exchange rate movements on the volume of foreign direct investment (FDI) flows by using the panel data of Japanese FDI flows to nine dynamic Asian economies. The large empirical literature on the impact of exchange rate movements on FDI has generally focused on the first and second moments of exchange rates, by addressing the following hypotheses: (i) a depreciation or devaluation of host country currency would encourage FDI inflows into the country; and (ii) greater exchange rate volatility would discourage FDI inflows. This paper, in addition, will also consider the third moment of exchange rate changes, which may under certain assumptions proxy for expected exchange rate changes (Chakrabarti and Scholnick, 2002; see also Ball and Mankiw, 1995 for an application of skewness to relative price changes). We frame our analysis in a model that controls for other standard determinants of FDI as well as the impact of the Asian financial crisis of 1997–1998.

Although the existing literature on FDI is considerable, most of it is concerned with bilateral flows between developed countries; studies that are focused on FDI flows from developed to developing or emerging market economies are rather limited; those addressing the impact of exchange rate expectations are even more limited (see Section 2 for a brief literature review). This is unfortunate because the Japanese government makes available detailed data on Japan's outward FDI to individual foreign countries, including all major Asian economies. We therefore utilize this dataset to investigate how exchange rate movements affect FDI flows. The use of Japanese data is particularly advantageous for our purpose, as the Japanese yen has fluctuated widely against major Asian currencies over the years, whereas many Asian currencies, notably the Chinese renminbi (RMB) and the Malaysian ringgit (not to mention the Hong Kong dollar), have displayed limited flexibility against the US dollar. The flexibility of the Japanese yen against Asian currencies would give us an ideal setting in which to investigate the impact of exchange rate movements on FDI flows from a developed to emerging and developing countries.

Japan has been an important source country for FDI, with the amount of outward FDI exceeding US$120 billion in 2008 (Fig. 1). While the share of Asia in Japan's outward FDI fluctuated between 15 and 40 percent, Japan provided a large sum of direct investment to Asia in the amount of over $200 billion during 1987–2008. Although reliable figures are difficult to obtain because of data consistency reasons, Japanese FDI has accounted for a significant

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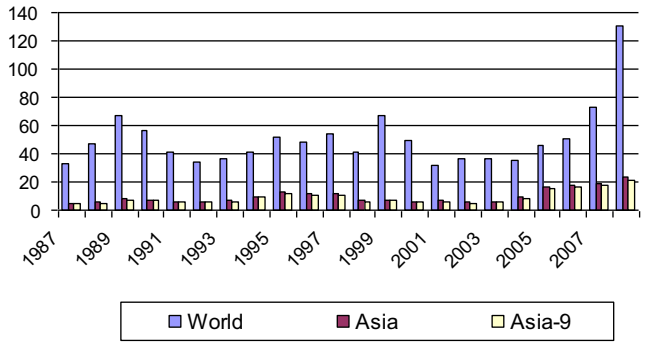

Fig. 1. Japan's Outward FDI Flows, 1987–2008 (in billions of US dollars). *Note*: Asia-9 includes: Mainland China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand.
Sources: Japanese Ministry of Finance; Japan External Trade Organization (JETRO).

part of total FDI inflows in some of the individual Asian economies in recent decades. It is estimated, for example, that the share of Japanese FDI in total FDI inflows during 1987–2008 was over 50 percent for the Philippines, nearly 40 percent for Korea and Thailand, over 20 percent for Malaysia, and about 10 percent for China and Singapore.[1] Thus, the determinants of FDI flows from Japan to Asian economies remain a topic of considerable academic and policy relevance. In investigating the determinants of Japanese FDI to Asia, we will focus on nine dynamic Asian economies (Asia-9), which together accounted for over 90 percent of Japan's outward FDI to Asia during this period.

The rest of the paper is organized as follows. Section 2 presents a brief overview of the empirical literature on the impact of exchange rate movements on FDI, focusing on three potential channels: the level of exchange rates, exchange rate volatility, and exchange rate expectations. Section 3 outlines the specification of our empirical methodology in which exchange rate movements are represented by the first and second moments of exchange rate levels and, as a novel feature, the third moment (skewness of the distribution) of exchange rate changes. Section 4 presents the empirical results, where we argue that the response of FDI to skewness can be interpreted naturally as capturing the expectations channel if we accept the mean-reverting property of floating exchange rates. Section 5 presents concluding remarks. Finally, the Appendix explains the sources of data.

2. A brief review of the literature on the impact of exchange rate movements on FDI

2.1. Exchange rate level and FDI

The modern literature on the impact of exchange rate changes on FDI begins with the assumption that the capital market is imperfect, such that borrowers face a premium for external borrowing. It is shown in this environment that a depreciation of host country currency would increase FDI inflows because the relative wealth of foreign investors would rise and the costs of inputs fall in terms of source country currency, allowing them to finance more of the investment internally. If for example a foreign investor is competing with local investors in the acquisition of a local company, with the appreciation of the source country currency, the foreign investor is more likely to raise the reservation price and to outbid their host country competitors. Froot and Stein (1991) broadly confirmed this prediction in the case of US inward FDI during 1974–1987.

Capital market imperfection cannot explain the stylized fact that different types of FDI respond differently to exchange rate changes. Blonigen (1997) thus developed a model that incorporates the assumption that the goods market is imperfect. Then, investors may not have equal access to all markets, so that exchange rate changes may affect the relative returns available to the source and host country investors from owning a particular asset. It is also possible that activities involving the purchase of firm-specific assets are more susceptible to currency movements. Blonigen (1997), in his analysis of Japanese acquisitions in the US during 1975–1992, found a strong negative correlation between the value of the US dollar and the volume of Japanese FDI for industries that likely involved firm-specific assets. In a more recent study based on German FDI during 1997–2002, Buch and Kleinert (2008) confirmed the validity of the goods market friction hypothesis by finding that an appreciation of source country currency promotes the acquisition of firm-specific assets abroad.

On balance, the existing literature seems to support the hypothesis that a depreciation of host country currency promotes FDI inflows. Harris and Ravenscraft (1991), for example, provide evidence that a weaker dollar is associated with larger FDI inflows into the US (see also Klein and Rosengren, 1994 for FDI flows from several developed countries to the US during 1979–1991; Dewenter, 1995 for foreign acquisitions in the US during 1975–1989). By and large, studies that looked at the impact of exchange rate movements on Japanese FDI also came to a similar conclusion, namely: an appreciation of the yen encouraged FDI outflows from Japan (e.g., Bayoumi and Lipworth, 1998; Goldberg and Klein, 1998; Xing and Zhao, 2008). At the same time, contrary evidence must also be noted (e.g., Stevens, 1998; Healy and Palepu, 1993). Some ambiguity thus remains, leading Pain and Van Welsum (2003) in their survey of the literature to conclude that the impact of exchange rate changes on FDI flows may differ across countries and types of investment.

2.2. Exchange rate volatility and FDI

There are competing views of how exchange rate volatility affects FDI flows. One strand of the literature emphasizes the effect of risk aversion on foreign investors' desire to postpone investment decisions (e.g., Kohlhagen, 1977; Dixit, 1989). Campa (1993) showed that risk neutral investors could also display similar behavior, finding evidence that exchange rate volatility caused US inward FDI inflows to decline in the 1980s (the effect was especially pronounced for industries with high sunk costs in physical and intangible assets).[2] Another strand emphasizes the adjustment costs of investment, especially the difficulty of reversing an investment decision once it is made (e.g., Dixit and Pindyck, 1994). Although postponing investment will eliminate any expected profit stream from that investment, the ability to make more profitable choices in the future will be retained. Thus, the likelihood of delay in investment when faced with uncertainty is greater for industries in which the product life cycle is long, or for which the expected lifespan of firm-specific assets is long (e.g., Blonigen, 1997; Dunning, 1993).

Yet another group of studies highlight the difference between vertical and horizontal FDI: vertical FDI, which involves the fragmentation of production processes across different countries, may be discouraged by exchange rate uncertainty because of the need to engage in intra-firm trade, whereas horizontal FDI, in which similar activities are undertaken in different locations, might even respond positively (Aizenman and Marion, 2004). Crowley and Lee (2003), on the other hand, suggest that, if FDI involves some form of joint venture, reversibility will depend on whether any tacit knowledge has been transferred. To the extent

[1] In obtaining these estimates, we have used official Japanese data for Japanese FDI outflows to the host economies and the IMF's *International Financial Statistics* on-line database for total FDI inflows into those economies. These two sets of data are not strictly comparable.

[2] On different types of sunk costs, see Chen et al. (2006) for details.