



# Sector specific foreign investment, labour inflow, economies of scale and welfare<sup>☆</sup>

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## ABSTRACT

This paper argues that the impact of foreign investment on welfare depends on the sector that attracts the investment and certain characteristics of the economy. It is shown that, as long as the intermediate good is non-traded, foreign investment in a sector that is subject to economies of scale increases welfare by increasing the size of the intermediate good sector. On the other hand, foreign investment in a sector that is subject to constant returns to scale decreases welfare by decreasing the size of the intermediate good sector. The impact of foreign investment (in either sector) on welfare depends on relative factor intensities when the intermediate good is traded.

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## 1. Introduction

Generally speaking, foreign investment is viewed as a powerful engine of economic growth, particularly in developing countries where the supply of domestic capital is inadequate. Improvement in communication technology and a relatively peaceful international environment have contributed towards a significant increase in foreign investment since the mid-1980s. The economic growth experiences of some Asian economies notably Hong Kong, Singapore, South Korea and Taiwan have been closely linked to their ability to attract significant foreign investment. It is widely believed that, in addition to facilitating technology and skills transfer, foreign investment creates jobs. Fig. 1 shows that, in recent years, less developed countries are attracting a larger proportion of foreign investment at the expense of the developed countries.<sup>1</sup>

The cost and benefit of foreign investment to host countries have been an issue of intense debate for a long period of time (for example see Meyer, 2003). While foreign investment is generally regarded as good for host countries, the empirical evidence is mixed. Indeed some studies

have shown that foreign investment can have a negative effect on host countries through increased competition and a decline in productivity.<sup>2</sup>

The theoretical literature that assumes perfect competition and constant returns to scale in all sector of the economy suggests that a small inflow of either capital or labour has no effect on welfare. Since the seminal work of Dixit and Stiglitz (1977), a number of studies have incorporated aspects of monopolistic competition in international trade models. This has resulted in re-examination and in some cases extension of a number of existing results. Markusen (1989) has shown that, in the presence of monopolistic competition, actual output level is below the socially desirable level. In other words, monopolistic competition leads to under production. This implies that, in the presence of monopolistic competition, the level of foreign investment in a country is also likely to be below the socially desired level. It is therefore desirable to develop policies that increase the level of foreign investment. By making use of a simple model where a small open economy produces one final good and non-traded producer services, Rivera-Batiz and Rivera-Batiz (1991) have shown that in the presence of monopolistic competition in services sector, a small inflow of capital can increase welfare whereas labour inflow has no effect on welfare.

Wong (1995) has argued that in the presence of monopolistic competition unrestricted international factor mobility may not lead to factor price equalisation. Wong has also argued that in the presence of monopolistic competition in the production of final goods, inflow of one factor can lead to an increase in the reward of all factors. Rodrik (1996) has shown that the presence of monopolistic competition can give rise to a situation where a high skill but low physical capital abundant country may be stuck in producing low-tech commodities accompanied

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<sup>1</sup> Despite a world-wide increase in foreign investment, most foreign investment takes place from one developed country to another. For example, more than 50% of the US foreign investment takes place in Europe and vice versa (See Appleyard et al., 2008). As far as the developing countries are concerned, since the Asian financial crisis of 1997–98, China is attracting a significant proportion of foreign investment destined for developing countries. While this paper does not consider the timing issue, it is perhaps worth mentioning that Yu et al. (2007) have considered the effect of fiscal incentives on the timing of foreign direct investment.

<sup>2</sup> See Lipsey (2002), Marino (2002) and Keller (2004).

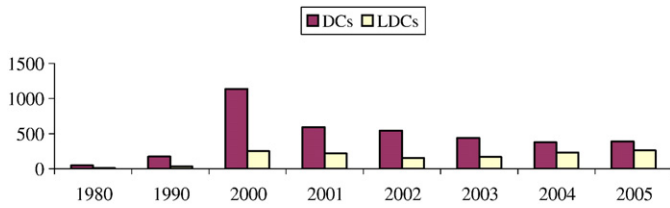


Fig. 1. Foreign investment inflows in billion US Dollars (1980-2005). Source: UNCTAD (2006).

by low wages. Rodrik argues that this situation requires government intervention. Rodriguez-Clare (1996) uses a model to argue that in the presence of monopolistic competition, an economy may be stuck in an equilibrium that involves production of labour intensive products and where returns to both labour and capital are low. This situation is likely to result in little or no foreign investment and domestic capital accumulation and the economy will be stuck in an underdevelopment trap. Government intervention would therefore be highly desirable. Barrios et al. (2005) have shown that due to positive externalities, foreign direct investment can increase GDP. In a recent multi-country study, Lejour et al. (2008) have empirically estimated the effect of foreign direct investment in services sector on GDP growth.

This paper attempts to extend the existing literature by re-examining the impact of foreign investment on welfare. Since the pioneering work of Neary (1978), a number of studies have utilised sector specific models to re-examine international trade and development policy issues. However, none of the available studies have considered the welfare impact of sector specific foreign investment in the presence of monopolistic competition. Foreign investment increases the supply of capital in the domestic market and it is well known that different types of capital are not perfect substitutes.<sup>3</sup>

The results presented in this paper are based on an extension of Rivera-Batiz and Rivera-Batiz (1991) model. This extension is useful because it allows one to provide a theoretical foundation for the mixed evidence provided by empirical studies. The paper argues that the effect of foreign investment on welfare depends on the sector that attracts this investment and certain characteristics of the economy. These characteristics include whether or not economies of scale are present in the economy and whether or not the intermediate goods are traded. This paper shows that, depending on relative factor intensities, foreign investment can lead to a decrease in welfare when the intermediate good is traded. While the focus of this paper is on the effect of foreign investment on welfare, the framework can also be used to examine the impact of labour inflow on welfare.

The rest of this paper is organised as follows. A simple general equilibrium model of a small open-economy is developed in section two. The impact of foreign investment and labour inflow on welfare is examined in section three whereas the last section offers some concluding remarks.

## 2. A simple general equilibrium model

Consider a small open-economy that produces two final goods (Y and Z) and a large number of varieties on an intermediate good (X). Production of both final goods is subject to constant returns to scale whereas production of the intermediate good is subject to internal economies of scale. Z is produced by means of capital and labour whereas Y is produced by means of labour, capital and varieties of the intermediate good.<sup>4</sup> This assumption captures differences in factor

intensities in an extreme manner. Specifically, this means that Y is intermediate good intensive as compared to Z. Each variety of the intermediate good is produced by means of capital and labour. Labour is fully mobile across all industries but capital is sector specific.<sup>5</sup> This assumption allows one to distinguish between the affect of foreign investment in different sectors. Producers of Y and varieties of X can be viewed as belonging to one sector which utilises a specific type of capital that cannot be used in the production of Z.<sup>6</sup> Following Das (2002), it can be argued that this assumption captures differences in factor intensities in an extreme manner. The production functions for Y and Z are as follows:

$$Y = (L_y^{1-\beta} K_y^\beta)^{1-\alpha} \left( \sum_{i=1}^n x_i^\delta \right)^{\frac{\alpha}{\delta}}$$

$$Z = L_z^{1-\gamma} K_z^\gamma$$

where  $\alpha, \beta, \gamma$  and  $\delta$  are parameters in the range [0,1];  $x_i$  is the output of the  $i$ -th variety of the intermediate good;  $n$  is the number of varieties produced;  $L_y$  and  $L_z$  respectively are labour used in the production of Y and Z;  $K_y$  and  $K_z$  respectively are capital used in the production of Y and Z.

Since the production of both final goods is subject to constant returns to scale, the average cost equals the marginal cost. On the other hand, the production of the intermediate good is subject to internal economies of scale. Accordingly, each firm specialises in the production of a single variety. The cost function of the  $i$ th variety is as follows:

$$c(w, r, x_i) = [\mu + \lambda x_i] w^{1-\theta} r m^\theta$$

where  $r_m$  and  $w$  respectively are the price of capital used in the production of Y and X, and the wage rate;  $\theta$  is a parameters in the range [0, 1]; and  $\lambda$  and  $\mu$  are positive constants;  $[\mu] w^{1-\theta} r_m^\theta$  is the fixed cost whereas  $[\lambda x_i] w^{1-\theta} r_m^\theta$  is the variable cost.

The above cost function, which is more general than the one utilised by Rivera-Batiz and Rivera-Batiz (1991), corresponds to a non-homogenous production function that was initially utilised by Venables (1996). All prices are measured in the units of Y. Following the existing literature, this paper focuses on a symmetric equilibrium where all varieties produced are equally priced. Accordingly, the aggregate production of X equals  $nx$  and hence the production function for Y can be written as follows:

$$Y = K_y^{\beta(1-\alpha)} L_y^{(1-\alpha)(1-\beta)} X^\alpha n^{\frac{\alpha(1-\delta)}{\delta}}$$

From the point of view of each firm in Y industry, the number of varieties supplied is given. Accordingly, the industry is subject to external economies of scale. The degree of external economies of scale is measured by the size of  $\frac{\alpha(1-\delta)}{\delta}$ , which assumed to be positive but less than unity for obvious reasons. Y and Z are produced under conditions of perfect competition. Because the intermediate good sector produces a large number of varieties, the price elasticity of demand for each variety is  $\frac{1}{1-\delta}$ .<sup>7</sup> Varieties of the intermediate good are produced under conditions of monopolistic competition. It is well-known that, due to free entry and exit of firms, each firm earns zero economic

<sup>5</sup> The model presented in this section can be viewed as an extension of the specific factor model.

<sup>6</sup> This point requires further clarification. It will be shown that the presence of internal economies in the production of intermediate good gives rise to external economies in the production of the final good sector and hence both X and Y can be viewed as belonging to one sector – a sector that is subject to economies of scale.

<sup>7</sup> For example, see Helpman and Krugman (1985), Marrewijk et al. (1997) and Das (2005).

<sup>3</sup> See Lejour et al. (2008) and references therein.

<sup>4</sup> Varieties of the intermediate goods can be viewed as producer services such as consulting, auditing, engineering, architectural and legal services. These services are primarily utilised by the industrial sector and therefore they do not enter as input in the production of all goods (see Markusen and Strand, 2007). The importance of services sector is highlighted by, among others, Eswaran and Kotwal (2002) and Long et al. (2005).

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