

Multinational firms, wage setting schemes and underemployment in developing economies

Andrzej Cieřlik*

Abstract

In this paper we study how knowledge transfers from multinational firms to their foreign subsidiaries affect local labor markets in developing host countries using a simple general equilibrium framework for a small open economy that combines crucial features of efficiency wage and factor specific models. First, we show that when multinational firms pay efficiency wages to their workers employed in foreign subsidiaries to prevent labor turnover and resulting diffusion of their specific knowledge among local competitors, while locally-owned firms offer competitive wages, labor market segmentation occurs in the host economy and otherwise identical workers are split into two groups: those with high-paying jobs in the multinational sector and those with low paying jobs in the local sector. If multinational firms are relatively more capital intensive than locally-owned firms, foreign knowledge transfers that are not accompanied by knowledge spillovers and physical capital inflows from abroad result in decreased wages of workers employed in locally-owned firms, as well as in the lower average wage despite increased national income. Second, if locally-owned firms mimic the wage setting behavior of multinational firms and offer efficiency wages, the host country may experience underemployment and the fall in its national income unless differences in relative capital intensity between multinational and locally-owned firms are small, capital inflows from abroad are large and foreign knowledge spillovers exist.

JEL classification codes: J41, F21, F23

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* - Macroeconomics and International Trade Theory Division, Department of Economics, Warsaw University, ul. Długa 44/50, Warsaw, PL-00241, Poland, phone: (48) 228314725, fax: (48) 228312846, *e-mail*: cieslik@wne.uw.edu.pl

1. Introduction

The host country effects of foreign direct investment (FDI) in developing and transition economies have long been a subject of interest to economists, politicians and policy makers. This interest has been renewed in the recent years for a number of reasons. First, many developing countries and economies in transition now actively seek inward FDI and investment promotion has come to occupy a prominent place in their development strategies. Since 1991, 58 more nations have begun to undertake proactive approaches to attracting FDI, making a total of 116 countries that now do so (Moran, 1998). Only in 2004 there were 271 changes in laws and regulations pertaining to FDI out of which 235 involved steps to open new areas to FDI along with new promotional measures (UNCTAD, 2005). Second, as a result of continued trade and investment liberalization the role of FDI in developing countries and economies in transition has grown dramatically over the 1990s, from \$24 billion per year in 1990 to \$233 billion per year in 2004 (UNCTAD, 2005). Third, empirical evidence on the benefits of FDI that are usually associated with inflows of foreign capital and knowledge, new job opportunities and higher wages is still rather ambiguous and seems country-specific.

In particular, the impact of multinational firms activity on host labor markets in developing countries and economies in transition still remains one of the most intriguing and sensitive areas in international and labor economics. On the one hand, there is substantial firm-level evidence suggesting that workers employed in multinational firms are paid higher wages than workers employed in locally-owned firms to make some commentators conclude that "...if regions or countries encouraging inward investment are interested in encouraging high-wage plants, foreign investors seem to meet that desire." (Lipsey, 2004; p.351). On the other hand, however, the numerous evidence on the impact of multinational firms on wages in domestically-owned firms as well as on the average wage levels in host economies does not look as sanguine.

Various reasons for multinational firms paying higher wages than domestic firms for labor of a given quality have been identified in the literature.¹ For example, Findlay (1978) conjectures that multinational firms pay a higher wage for labor of the same quality than domestic firms for purposes of good public relations. In the similar spirit Lipsey (2004; p. 346) argues that "...foreign firms, because of their limited understanding of local labor markets, pay higher wages to attract better workers, while more knowledgeable local firms can identify and attract better workers without paying them higher wages". However, multinational firms are also known for paying efficiency wages to their workers.² An early observation of higher wages in American firms in Colombia to motivate local workers has been provided by Rippy (1931; p. 190) who noted that Colombian

¹ See, for example, Barba Navaretti and Venables (2004) for a recent survey of the relevant literature.

² The terms "efficiency wages" or "efficiency earnings" appeared probably for the first time in Marshall (1920; pp. 456-69) who argued that highly-paid labor is generally very efficient and therefore not very expensive.

labor "...is better remunerated and granted more sanitary quarters by foreigners than by natives, but the foreigners probably expect more systematic and strenuous effort."

The efficiency wage hypothesis in the context of developing countries was advanced first by Leibenstein (1957) who emphasized the link between wages, nutrition and health. According to his hypothesis an increase in the real wage rate that allows for improved worker nutrition and increased physical strength results in increased output per unit of time spent on working. However, the purely biological explanation of the link between productivity and wages seems applicable only to the least developed countries (LDCs). In the context of more developed economies various formal microeconomic models of efficiency wages were proposed in the late 1970s and early 1980s.³ These early models included reduced shirking (Calvo, 1979; Shapiro and Stiglitz, 1984), lower labor turnover and training costs (Stiglitz, 1974; Schlicht, 1978; Salop, 1979) better ability to screen and select high-quality workers (Stiglitz, 1976; Weiss, 1980; Malcolmson, 1981) and improved morale and loyalty (Akerlof, 1982, 1984). In addition to those traditional explanations, in the recent models of multinational firms proposed by Fosfuri et al. (2001) and Glass and Saggi (2002) efficiency wages can be seen as a device that prevents dissipation of their firm-specific knowledge capital through decreased mobility of workers between foreign- and locally-owned firms in the host country.

Although the studies that document the fact that wages in foreign-owned firms are higher than in locally-owned firms have a long history formal statistical evidence is available only from the early 1980s. A frequently quoted early example is Blomström (1983) who investigated Mexican manufacturing industries to find that on average foreign-owned firms paid wages about 25 per cent above those in locally-owned firms. According to the more recent studies that were carried out by Harrison and her collaborators and were summarized in Harrison (1996) ratios of foreign to domestic plant wages were significant and ranged from 1.1 to 1.9 in Cote d'Ivoire, 1.3 to 2.6 in Morocco and 1.2 to 2.0 in Venezuela. Several studies on Indonesia by Hill (1990), Manning (1998) and Lipsey and Sjöholm (2003) also found that foreign-owned firms paid higher wages than domestic firms.

While empirical studies generally confirm that multinational firms pay higher wages than locally-owned firms a separate issue is whether the payment of higher wages by multinational firms is accompanied by higher wages also in local firms, i.e. whether positive "wage spillovers" exist, and whether the activities of multinational firms cause the average wage level in the host economy to rise. In the frequently cited study for two Latin American economies by Aitken et al. (1996) no positive wage spillovers were detected in Mexico while in Venezuela there seemed to be a significant negative influence of multinational firms on wages in domestically-owned firms. Aitken et al. (1996) reported, however, that despite the lack of positive spillovers from foreign to domestic plants in Mexico and Venezuela higher foreign involvement in production activities

³ See, for example, Yellen (1984), Akerlof and Yellen (1986), Katz (1986, 1988) and Weiss (1990), for surveys of the early efficiency wage theories. According to Gordon (1990) the efficiency wage theory could be called 'the rage of the 1980s'.

was associated with higher industry wages. The summary of evidence the existence of negative spillovers from FDI has been provided by Görg and Greenaway (2001) in their survey article. More recently Lipsey and Sjöholm (2004) have presented evidence on positive wage spillovers from foreign presence to Indonesian firms that makes Lipsey (2004) argue that there is enough evidence to preclude any conclusions that wage spillovers are typically negative.

Despite a large number of empirical studies on spillovers from FDI the impact of foreign presence on wages in local firms and average wage levels in the host country remains ambiguous and country-specific. Moreover, while the existing work is usually limited to studying the effects of capital inflows, technological change or knowledge spillovers no attempts were made to control for the link between the impact of increased foreign involvement and innovative wage setting schemes brought by multinational firms to host economies and their subsequent adoption by locally-owned firms. Therefore, the main goal of this paper is to extend the existing theoretical literature to resolve the puzzles and ambiguities that were reported in empirical studies. In particular, we investigate how the expansion of multinational firms in the host economy affects its labor market variables, such as wages in locally-owned firms, the average wage level in the host economy, total employment and national income. We show that the impact of increased foreign involvement on these variables depends on wage setting schemes employed by both firm types, differences in capital intensity between them, the amount of physical capital transferred to the host country as well as the magnitude of knowledge spillovers from multinational to locally-owned firms. The contribution of this paper is thus twofold. First, it combines two separate strands in the economic literature: the labor market literature on efficiency wages and trade and development literature on the impact of FDI on the host country labor market. Second, it identifies conditions necessary for the expansion of multinational activity to result in increased wages in locally-owned firms as well as in the higher average wage level in the host economy, i.e. for positive wage spillovers from FDI.

The paper is organized as follows. In Section 2 we present the main assumptions of the theoretical model that will be used to study the impact of increased foreign involvement the host country on its labor market in subsequent sections. In Section 3 we assume that multinational firms employ efficiency wage setting schemes to motivate their workers while the wage setting behavior of locally-owned firms remains unaffected by the expansion of the multinational firms and they continue offering competitive wages. In this case labor market segmentation in the host country occurs and otherwise identical workers get split into two groups: those with high-paying jobs in multinational firms and those with low-paying jobs in locally-owned firms. In Section 4 we show that if locally-owned firms mimic the wage setting behavior of multinational firms and introduce efficiency wage schemes to prevent the outflow of their employees workers to

multinational firms and to reduce labor turnover this may result in underemployment in the host country. Section 5 concludes with policy recommendations and guidelines for future research.

2. Model Assumptions

To study the impact of expansion of multinational firms in the host country we use a simple factor specific general equilibrium model proposed by Caves (1971) and subsequently extended by Batra and Ramachandran (1980), Batra (1986) and Beladi and Choi (1995) to mention a few examples. Following the previous theoretical studies our measure of foreign involvement is the stock of foreign knowledge transferred from the parent to the host country that may or may not be accompanied by the inflow of physical capital.⁴ According to Batra (1986; p. 343) in developing countries "...the investment by the multinational firms has been paltry in comparison to the vast degree of economic control that they exercise. In other words, the underdeveloped world has been the recipient of superior technology, but not much foreign capital." Therefore, Batra (1986) assumed that multinational firms transfer capital-intensive technologies from developed parent countries but relatively small amounts of physical capital to developing host countries and identified three negative effects of FDI. First, the expansion of multinational firms leads to a shift of capital from the local to the multinational sector that results in an increase in employment and output in this sector and the decline of the local sector. Second, if the multinational sector is relatively more capital intensive than the local sector and real wages are rigid the expansion of multinational firms leads to a decline in total employment in the host country. Third, the expansion of multinational firms causes a decline in the real national income in the host country if the knowledge transfer from the parent country is not accompanied by capital transfer.

Foreign knowledge has the properties of a public good, i.e. it is non-rival and can be used in multiple locations at the same time. For example, blueprints once created can be supplied at a relatively low cost to foreign subsidiaries without reducing the value or productivity of these assets in existing production facilities (Markusen, 2002). However, if foreign knowledge is not fully excludable there might be intersectoral knowledge spillovers that raise the productivity of locally-owned firms in the host country. Therefore, Batra's

⁴ The early theoretical studies of FDI viewed the expansion of multinational firms as the transfer of financial or physical capital. However, with the development of the so-called New Trade Theory literature it turned out that the expansion of multinational firms, often described as "foreign direct investment", and tracked via balance-of-payments statistics was a conceptual misunderstanding (Krugman, 1995). According to the new concept FDI is "... a set of economic activities or operations carried out in a host country by firms controlled or partly controlled by firms in some other (home) country. These activities are, for example, production, employment, sales, the purchase and the use of intermediate goods and fixed capital, and the carrying out of research." (Lipsey, 2004; p.334). In this new concept of FDI no movement of physical capital is necessary, although it could take place. In terms of the theory it was Caves (1971) who first used the specific factor model to argue that FDI is associated with the transfer of firm-specific capital, although the idea that multinational firms are vehicles for the transfer of firm-specific assets rather than physical or financial capital goes back at least to Hymer (1960). According to Markusen and Maskus (2003) the approach proposed by Caves (1971) can be regarded as a crucial step in differentiating direct investment associated with the inflow of firm intangible assets from the portfolio flows of homogenous capital in the earlier neoclassical models of FDI proposed by MacDougall (1960) and Kemp (1962).

(1986) early model has been frequently criticized for not taking into account the positive knowledge spillover stemming from FDI onto domestic firms. For example, Beladi and Choi (1995; p.681) noted that: “In the presence of the spillover effect, the net effect of MNCs is generally ambiguous, depending on the magnitude of the spillover effect.” Following Beladi and Choi (1995) in the present study we also consider potential positive technological externalities that may accompany the activity of multinational firms in addition to foreign knowledge and capital transfers to the host country, although their existence has been disputable (Görg and Greenaway, 2001).

Like in the previous theoretical work we denote sectors in which operate multinational and locally-owned firms by X and Y, respectively. Both sectors employ two non-specific and locally supplied factors of production: capital K and labor L. Although inputs of both non-specific factors are necessary to produce goods in both sectors we allow for some substitution between capital and labor in response to relative factor price changes.⁵ In addition to inputs of non-specific factors the multinational sector requires also an input of a specific factor – foreign knowledge, denoted by S that is transferred from the parent country. The aggregate production functions of the multinational and the local sectors are given by:

$$Q_X = F(K_X, L_X, E(w_X), S) \quad (1)$$

$$Q_Y = g(S)G(K_Y, L_Y, E(w_Y)) \quad (2)$$

where: Q_X and Q_Y denote the outputs of sectors X and Y, respectively; K_i, L_i the amounts of capital and labor employed in the i -th sector, respectively $i = X, Y$; $E(w_i)$ measures the effort of workers employed in the i -th sector that is assumed to depend positively on the wage offered to the workers in this sector, $E'(w_i) > 0$, S is the input of foreign knowledge used in the multinational sector, $g(S)$ the measure of the intersectoral spillover effect from multinational firms on the local sector. It is assumed that this spillover effect is positively related to the stock of foreign knowledge available in the host economy, i.e. $g'(S) > 0$. This spillover effect can be interpreted as Hicks neutral technological progress that increases productivity of both non-specific factors employed in the local sector. Following Batra and Ramachandran (1980; p. 279) we treat S as “...a state variable whose value in any instant of time depends on the past efforts at developing the specific skills possessed by the multinational firm” and assume that S is measured not in terms of physical units but some intangible abstract units.

We assume that production functions in both sectors satisfy standard neoclassical properties. In other words, they are monotone increasing, strictly concave and homogenous of degree one.⁶ Their main properties of production functions for multinational and local sectors can be expressed as follows:

⁵ For example, an increase in the relative price of labor would increase the intensity of capital in both sectors.

⁶ Due to the assumed linear homogeneity of production functions marginal products are homogenous of degree zero. From the Euler theorem we can infer that $F_{LL}L_X + F_{LK}K_X + F_{LS}S = 0$ and $G_{LL}L_Y + G_{LK}K_Y = 0$, hence $F_{LL}F_{KK} - F_{KL}^2 > 0$ and $G_{LL}G_{KK} - G_{KL}^2 = 0$.

$$F_i > 0, F_{ii} < 0, F_{ij} > 0 \quad (3)$$

for: $i, j = K, L, S$, and $i \neq j$.

$$G_i > 0, G_{ii} < 0, G_{ij} > 0 \quad (4)$$

for: $i, j = K, L$, and $i \neq j$.

We assume profit-maximizing behavior of all firms in both sectors. The profit maximization problem of a representative multinational firm from its operations in the host country can be written as follows:

$$\max_{K_X, L_X, w_X} \Pi_X = p_X Q_X - w_X L_X - r_X K_X - F \quad (5)$$

where: p_X denotes the price of goods produced in sector X , w_X the wage rate offered by multinational firms, r_X the capital rental rate in the multinational sector and F the cost of producing the specific factor S .

It is assumed that multinational firms maximize their profits given prices of their products and given the capital rental rate. The representative multinational firm chooses factor inputs K_X and L_X , as well as the wage rate w_X it will be offering to its employees to maximize its profits. The first order conditions for this maximization problem are given by:

$$p_X F_K(K_X, L_X, E(w_X), S) = r_X \quad (6)$$

$$p_X F_L(K_X, L_X, E(w_X), S) = w_X \quad (7)$$

$$p_X F_E(K_X, L_X, E(w_X), S) = L_X \quad (8)$$

Equation (6) is the standard equality between the value of marginal product of capital and its rental rate that allows determining the optimal employment of capital K_X^* given its rental rate r_X . Equations (7)-(8) jointly allow determining the optimal employment of labor L_X^* and the optimal efficiency wage rate w_X^* .

Since the production function $F(\cdot)$ is linearly homogenous the equilibrium profit level of a representative multinational firm repatriated to the parent country is given by:

$$\hat{\Pi} = p_X F_S S - F, \quad (9)$$

where: F_S is the marginal product of knowledge.

According to Batra (1986) $\hat{\Pi}$ constitutes simply an addition to the global profits of the multinational firm since utilization of knowledge in the host country does not diminish its use in the parent country.

Similarly, the profit maximization problem of local firms in the host country can be written as follows:

$$\max_{K_Y, L_Y, w_Y} \Pi_Y = p_Y Q_Y - w_Y L_Y - r_Y K_Y \quad (10)$$

where: p_Y denotes the price of goods produced in sector Y , w_Y the wage rate in the local sector, and r_Y the capital rental rate in the local sector.

Initially, we will assume that behavior of local firms is neoclassical, i.e. they maximize their real profits taking the prices of their products as well as factor prices and their workers' level effort $E(\cdot)$ as given. Then we will relax this assumption and assume that local firms mimic the wage setting of multinational firms and also start offering efficiency wages to their workers. In the former case we obtain a standard set of the first order conditions describing the equality between the values of marginal products of capital and labor, and capital rental and wage rates, respectively:

$$p_Y g(S) G_K(K_Y, L_Y, E(w_Y)) = r_Y \quad (11)$$

$$p_Y g(S) G_L(K_Y, L_Y, E(w_Y)) = w_Y \quad (12)$$

In the latter case the set of first order conditions must be supplemented by an additional condition, that constitutes a counterpart of condition (8) in the multinational firm's optimization problem:

$$p_Y g(S) G_E(K_Y, L_Y, E(w_Y)) = L_Y \quad (13)$$

For simplicity we assume that the host country is a small open economy that takes the relative price of goods produced in both sectors p_X/p_Y as given and determined in the rest of the world. Without loss of generality we can further assume that the relative price of goods is constant and normalized to unity so that $p_X = p_Y = 1$. This assumption implies that the nominal factor rewards in first order conditions (6) – (8) and (11) – (13) become real factor rewards expressed in terms of marginal products of capital and labor like in a standard efficiency wage model.

We assume that non-specific factors of production are fully mobile within and between two sectors in the host economy. If there are no capital market imperfections capital rental rates must be the same in both sectors:⁷

$$r_X = r_Y = r \quad (14)$$

However, despite potential mobility of workers between sectors if wage setting schemes in the multinational and the local sectors differ, i.e. multinational firms offer efficiency wages to their workers while local firms offer competitive wages, equalization of wages across sectors will not occur. In this case the efficiency wage rate offered to workers employed in the multinational sector w_X^* will be higher than the average wage rate in the host economy w , and the competitive wage offered by firms in the local sector w_Y :

$$w_X^* > w > w_Y \quad (15)$$

This will lead to the emergence of a dual labor market in the host economy were otherwise identical workers are split into two groups: “workers aristocracy” who were lucky to obtain high-paying jobs in the

⁷ Batra (1986) argues that owners of capital may be more willing to lend to multinational firms than to local firms and assumes the presence of rental rate differentials, i.e. $\alpha r_X = r_Y$, where $\alpha > 1$. In this paper we focus on the host country labor market implications of the expansion of multinational firms and neglect the existence of the rental rate differential, however, it can be easily shown that our results do not crucially depend on the existence of this differential.

multinational sector and the remaining workers who were less fortunate and are paid low competitive wages in the local sector, and there is no actual mobility of workers between multinational and local firms.

However, if we assume that local firms change their wage setting behavior in response to the expansion of the multinational firms in the host country and also start offering efficiency wages to their workers wage rates may eventually be equalized across sectors:

$$w_X^* = w_Y^* = w^* \quad (16)$$

We assume that in any instant of time the stocks of all factors of production available in the host country are given and independent of their rewards. However, the stock of capital in the host country may be positively related to the stock of foreign knowledge transferred from the parent country if the knowledge transfer is accompanied by the inflow of physical capital from abroad. We assume full employment of capital and foreign knowledge available in the host country:

$$K_X + K_Y = \bar{K}(S) \quad (17)$$

$$S = \bar{S} \quad (18)$$

where: \bar{K} and \bar{S} are the stocks of capital and foreign knowledge available in the host country, respectively.

As far as the labor market is concerned we consider two scenarios that correspond to two possible wage setting schemes employed by locally-owned firms. In the first case, we assume that their initial competitive wage scheme is not affected by the expansion of multinational firms and the full employment of labor in the host country prevails:

$$L_X + L_Y = \bar{L} \quad (19)$$

In the second case, we assume that locally-owned firms change their wage setting behavior and adopt the efficiency wage setting schemes brought to the host country by multinational firms. In this case, the adoption of efficiency wages by locally-owned firms may lead to the emergence of underdevelopment in the host country:

$$L_X + L_Y = L \leq \bar{L} \quad (20)$$

where: L is the actual employment and \bar{L} the total stock of labor available in the host economy.

In the next section we undertake comparative static analysis of the impact of foreign knowledge transfer on the changes in factor allocation between sectors, wages in the local sector, the average wage level and the national income in the host country.

3. Dual labor market

In this section we study the impact of foreign knowledge transfer that may be accompanied by the inflow of physical capital from abroad and knowledge spillovers to locally-owned firms assuming that the wage setting

behavior of these firms is not affected by the expansion of multinational firms that are offering efficiency wages to their workers. This leads to the emergence of a dual labor market in the host economy. Multinational firms offer an efficiency wage of w_X^* that is above the competitive wage w_Y offered by local firms. Efficiency wages w_X^* and employment in the multinational sector L_X are determined by the set of first order conditions (7)-(8) discussed in Section 2. Assuming fixed labor supply \bar{L} and full employment of labor in the host country, employment in the local sector L_Y can be determined as the residual claimant on labor by local firms, i.e. the difference between the labor supply and demand for labor by multinational firms given the efficiency wage set by multinational firms. The competitive wage w_Y in the local sector is then determined by the equality between the demand for labor by local firms and the residual labor supply ($L_Y = \bar{L} - L_X$).

The initial allocation of non-specific factors of production between the multinational and the local sectors can be obtained by combining conditions (6)-(8), (11)-(12), (14) and (17)-(19). For simplicity we normalize terms $E(\cdot)$ in the set of first order conditions (11)-(12) for local firms, that are independent of the wage rates under the competitive wage setting strategy employed by locally-owned firms, to unity and suppress them. Solving the following system of three equations allows us to find three endogenous variables K_X , L_X and w_Y as functions of the fixed parameters of the model:

$$F_K(K_X, L_X, E(w_X^*), \bar{S}) = g(\bar{S})G_K(\bar{K}(\bar{S}) - K_X, \bar{L} - L_X) \quad (21)$$

$$w_X^* = F_L(K_X, L_X, E(w_X^*), \bar{S}) \quad (22)$$

$$w_Y = g(\bar{S})G_L(\bar{K}(\bar{S}) - K_X, \bar{L} - L_X) \quad (23)$$

To examine changes in the allocation of capital and labor between sectors and the competitive wage in the local sector, resulting from increased multinational involvement in the host country, represented by a positive change in the parameter \bar{S} , we differentiate totally modified equilibrium conditions in the factor markets (21)-(23) and obtain the following matrix system:

$$\begin{bmatrix} F_{KK} + g(S)G_{KK} & F_{KL} + g(S)G_{KL} & 0 \\ F_{LK} & F_{LL} & 0 \\ -g(S)G_{LK} & -g(S)G_{LL} & -1 \end{bmatrix} \begin{bmatrix} dK_X \\ dL_X \\ dw_Y \end{bmatrix} = \begin{bmatrix} -F_{KS} + g'(S)G_K + g(S)G_{KK}\lambda \\ -F_{LS} \\ -g'(S)G_L - g(S)G_{LK}\lambda \end{bmatrix} dS \quad (24)$$

where: $\lambda = dK(S)/dS$ denotes the change in the physical capital stock available in the host country as a result of the capital inflow from abroad accompanying the foreign knowledge transfer.

We can solve the above system by computing appropriate determinants and applying the Cramer's rule. Following Batra (1986) we investigate the effects of the expansion of the multinational sector assuming that it is more capital-intensive than the local one, $k_X > k_Y$. In this case it can be demonstrated that the

determinant of the matrix of second derivatives is negative when the multinational sector is more capital intensive than the local sector $k_X > k_Y$.⁸

The solution of the system (24) allows us to determine the change in the allocation of factors of production in the multinational and local sectors as well as the change in the competitive wage rate offered by local firms to their workers as a result of the foreign knowledge transfer and capital inflow from abroad when this knowledge is not fully excludable and spills over onto locally-owned firms raising the productivity of their non-specific inputs.

$$\frac{dK_X}{dS} = \frac{\{F_{LL}F_{KS} - [F_{KL} + g(S)G_{KL}]F_{LS}\} - g(S)F_{LL}G_{KK}\lambda - g'(S)F_{LL}G_K}{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X} \quad (25)$$

$$\frac{dL_X}{dS} = \frac{\{-F_{KL}F_{KS} + [F_{KK} + g(S)G_{KK}]F_{LS}\} + g(S)F_{KL}G_{KK}\lambda + g'(S)F_{KL}G_K}{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X} = -\frac{dL_Y}{dS} \quad (26)$$

$$\begin{aligned} \frac{dw_Y}{dS} &= \frac{g(S)\{(F_{KL}G_{KL} - F_{KK}G_{LL})F_{LS} + (F_{KL}G_{LL} - F_{LL}G_{KL})F_{KS}\} - g(S)H_X G_{KL}\lambda}{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X} \\ &+ \frac{g'(S)\{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}]G_L + (F_{LL}G_{KL} - F_{KL}G_{LL})G_K - H_X G_L\}}{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X} \end{aligned} \quad (27)$$

where: $H_X = F_{KK}F_{LL} - F_{KL}^2 > 0$.

We can notice that the numerators of (25) – (27) contain both negative and positive terms associated with technology change, capital inflow and foreign knowledge diffusion among local firms, respectively. However, capital inflows to many developing countries and economies in transition may not be substantial due to political instability and the higher risk of expropriation than in developed countries. Moreover, multinational firms usually transfer older technology to developing countries to produce fairly standardized products and to extract natural so the scope for positive externalities associated with knowledge diffusion from these types of activities among locally-owned firms may be very limited there (Mansfield and Romero, 1980; Moran, 1998). Therefore, in the benchmark case, like in early the model of Batra (1986) no physical capital flows and no knowledge diffusion will be considered.

If there is no physical capital inflow from abroad, $\lambda = 0$, and foreign knowledge transferred to the host country is fully excludable, $g'(S) = 0$, then all terms in the numerators of (25) – (26) are negative and both expressions are positive since the expression in denominator is also negative for $k_X > k_Y$. The terms in the numerator of (27) are positive and the whole expression is negative as the denominator is negative.⁹ This

⁸ Using the properties of our production functions we can substitute $-(F_{KL}k_X + F_{LS}S/L_X)$ for F_{LL} and $-G_{KL}/k_Y$ for G_{KK} , hence the whole term describing the determinant of the matrix $g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X$ can be written as $g(S)G_{KL}[F_{KL}(1-k_X/k_Y) - F_{LS}(S/L_X)(1/k_Y)] - H_X < 0$ when $k_X > k_Y$.

⁹ Using the properties of our production functions we can substitute $-(F_{KL}k_X + F_{KS}S/K_X)$ for F_{KK} , $-(F_{KL}k_X + F_{LS}S/L_X)$ for F_{LL} and $-G_{KL}k_Y$ for G_{LL} , the term in the numerator of (27) $g(S)\{(F_{KL}G_{KL} - F_{KK}G_{LL})F_{LS} + (F_{KL}G_{LL} - F_{LL}G_{KL})F_{KS}\}$ can be written as $g(S)G_{KL}\{F_{KL}[(1-k_Y/k_X)F_{LS} + (k_X-k_Y)F_{KS}] + F_{LS}F_{KS}S/K_X(k_X-k_Y)\} > 0$ when $k_X > k_Y$.

means that the employment of both capital and labor in the multinational sector expands at the expense of the locally-owned firms that are unable to compete for local non-specific factors of production.

When relatively more capital than labor is relocated from the local to the multinational sector the real wage rate in the local sector falls while in the multinational sector it remains unchanged at the efficiency level w_x^* . The key implication of the efficiency wage setting scheme employed by multinational firms in this model is that the real wage offered to workers in multinational firms is independent of productivity changes brought about by the transfer of foreign knowledge to the host country, while the level of employment is not. In other words, the knowledge transfer leads to an increase in employment in the multinational sector with no change in real efficiency wages. As the multinational sector is more capital intensive than the local one the increased involvement of multinational firms translates into a decrease in total demand for labor in the host country and those workers who are fortunate to obtain jobs in the multinational sector enjoy higher wages while the rest of workers who remain employed at locally-owned firms experience a decrease in their real wages. In this case the larger the difference in relative capital intensity between sectors the bigger the fall in competitive wages paid by the local firms.

The decrease in employment in the local sector is offset by the increase in employment in the multinational sector as the total supply of labor in the host country is fixed and full employment in the host country is assumed. Similarly, if the transfer of foreign knowledge is not accompanied by an inflow of physical capital from abroad an increase in the employment of capital in the multinational sector must be offset by a decrease in capital employment in the local sector.

$$\frac{dK_Y}{dS} = \frac{dK(S)}{dS} - \frac{dK_X}{dS} = \lambda - \frac{\{F_{LL}F_{KS} - [F_{KL} + g(S)G_{KL}]F_{LS}\} - g(S)F_{LL}G_{KK}\lambda - g'(S)F_{LL}G_K}{g(S)[F_{KL}G_{KL} - F_{LL}G_{KK}] - H_X} \quad (28)$$

However, if we allow for the capital inflow from abroad that accompanies the transfer of foreign knowledge the amount of capital drawn out of the local sector will now be smaller. In an extreme case, multinational firms may bring all the capital they need for their operations in the host country from abroad and may not use the local capital market at all.¹⁰ We can calculate λ that corresponds to the situation when the amount of capital employed in the local sector remains unchanged in response to the expansion of multinational firm in the host country, $dK_Y/dS = 0$:

$$\lambda = \frac{F_{LL}F_{KS} - [F_{KL} + g(S)G_{KL}]F_{LS}}{g(S)F_{KL}G_{KL} - H_X} + \frac{g'(S)F_{LL}G_K}{g(S)F_{KL}G_{KL} - H_X} \quad (29)$$

From (29) we can notice that the capital inflow from abroad necessary to keep the employment of capital in the local sector unchanged depends negatively on the magnitude of knowledge spillovers from the

¹⁰ This situation corresponds to pure greenfield investment when all the physical capital needed by multinational firms for their operations in the host country is brought from abroad.

multinational to the local sector. Diffusion of foreign knowledge among local firms increases the productivity of non-specific inputs employed in the local sector and decreases the reallocation of factors from the local to the multinational sector.¹¹ If diffusion of foreign knowledge and capital inflow from abroad are sufficiently large, real wages in the locally-owned firms might increase instead of falling.¹² However, there will still be segmentation of the local labor market into high-paying jobs in multinational firms and low-paying jobs in the local firms, although wage disparities between foreign- and locally-owned firms will not be as large as when there is no capital inflow and knowledge diffusion.

The impact of the expansion of the multinational sector on the average wage in the host country is also ambiguous and depends on the relative magnitudes of various effects that determine changes in the size of the multinational sector and in the competitive wage rate offered in the local sector. The average wage rate in the economy can be expressed as a weighted average of wages offered in both sectors with the weights equal to the shares of these sectors in total host country employment:

$$w = w_X^* \left(\frac{L_X}{\bar{L}} \right) + w_Y \left(\frac{L_Y}{\bar{L}} \right) \quad (30)$$

Differentiating totally expression (30) and assuming that the efficiency wage and the total stock of labor are independent of the inflow of foreign knowledge we obtain:

$$\frac{dw}{dS} = \frac{(w_X^* - w_Y)}{\bar{L}} \frac{dL_X}{dS} + \left(\frac{\bar{L} - L_X}{\bar{L}} \right) \frac{dw_Y}{dS} \quad (31)$$

The first term in (31) is always positive as the efficiency wage offered by multinational firms is always higher than the competitive wage offered by local firms, $w_X^* - w_Y > 0$. However, if there is neither physical capital inflow from abroad nor diffusion of foreign knowledge among locally-owned firms in the host country the second term in (31) associated with a change in the competitive wage rate in the local sector is negative. Hence the average wage in the host country may fall, remain unchanged or increase. For example, when the difference between the efficiency wage offered by multinational firms and the competitive wage offered by local firms and the expansion of multinational firms in terms of employment are large, and the share of the local sector in total employment and a decrease in the competitive wage in the local sector are small then the average wage in the host economy will increase. Obviously, when the competitive wage in the local sector increases with the expansion of the multinational sector, also the average wage level in the host

¹¹ The expression (29) can be plugged into the formulas describing changes in employment and wages in the local sector to demonstrate that the expansion of the multinational sector in terms of employment drawn out of the local sector will now be smaller, and the outflow of some workers from the local to the multinational sector will increase wages in the local sector due to increased productivity of labor resulting from the higher capital to labor ratio.

¹² Using the properties of our production functions we can substitute $-(F_{KL}k_X + F_{LS}S/L_X)$ for F_{LL} , $-G_{KL}/k_Y$ for G_{KK} , and $-G_{KL}k_Y$ for G_{LL} , the last term in the numerator of (27) $g'(S)\{g(S)/(F_{KL}G_{KL} - F_{LL}G_{KK})G_L + (F_{LL}G_{KL} - F_{KL}G_{LL})G_K\}$ can be written as $g'(S)G_{KL}\{F_{KL}[g(S)G_L/k_X + G_K](k_Y - k_X) - F_{LS}S/L_X[g(S)G_L/k_Y + 1]\} < 0$ when $k_X > k_Y$.

economy will rise. In this case, despite the fragmentation of the host country labor market into high-paying jobs in the multinational sector and low-paying jobs in the local sector, all workers in the host country will be better off in absolute terms, although those who were fortunate to find jobs in the multinational sector will benefit more from foreign involvement in the host economy.

The labor market segmentation in the host country presented in this paper closely resembles the dual labor market structure described in the early papers on efficiency wages in the early development literature such as Stiglitz (1976) or Bulow and Summers (1986). However, unlike in those studies, in this paper labor market segmentation is not caused by internal conditions in the host country but rather arises endogenously as a response to the expansion of multinational firms in the host economy whose wage setting schemes differ from those employed by locally-owned firms.

Finally, let us investigate the change in the national income of the host country as a result of the expansion of multinational firms. Following Batra (1986) and Beladi and Choi (1995) we can define real national income of the host country as the sum of volumes of output produced in both sectors net of the foreign factor rewards that are assumed to be fully remitted to the parent country:

$$I = F(K_X, E(w_X^*), L_X, \bar{S}) + g(\bar{S})G(K(\bar{S}) - K_X, \bar{L} - L_Y) - F_S S - rK^{Foreign} \quad (32)$$

where: $K^{Foreign}$ denotes the amount of foreign physical capital invested in the host economy.

Differentiating (33) and using (21)-(23) we can express the change in the national income in the host country as follows:

$$\frac{dI}{dS} = (w_X^* - w_Y) \frac{dL_X}{dS} + g'(S)Y - \frac{dF_S}{dS} S - \frac{dr}{dS} K^{Foreign} \quad (33)$$

From (34) we can notice that the change in the national income in the host country is the sum of four terms. The first two are the increase in the wage bill due to increased employment in the multinational sector that offers higher wages than in the local sector and the effect associated with foreign knowledge diffusion among local firms that increases productivity of local non-specific factors of production employed in the local sector, respectively. The remaining two terms represent changes in the marginal products of knowledge and physical capital due to the knowledge transfer, respectively. Following Batra (1986) we assume that initial involvement of multinational firms in the host country was small and neglect the last two terms. In this case, we can notice that although the impact of increased multinational involvement on average wages in the host economy may be adverse in certain situations, the total income of the host country will always increase. The magnitude of this increase depends positively on the wage difference between foreign and domestic firms, the size of labor reallocation from domestic to foreign firms as well as the extent of knowledge spillovers to locally-owned firms.

4. Underemployment

In order to prevent the outflow of workers to multinational firms locally-owned firms that compete with them in the local factor markets may adopt efficiency wage setting schemes and offer the efficiency wage w_Y^* that is above the previously offered competitive wage w_Y . For simplicity we assume that efficiency wages offered in both sectors are exactly the same, $w_X^* = w_Y^* = w^*$, and independent of one another. The efficiency wages and the employment of labor in both sectors are determined by the sets of first order conditions (7)-(8) and (12)-(13) for multinational and locally-owned firms, respectively. In this case the increased transfer of foreign knowledge when this knowledge is fully excludable and not accompanied by the inflow of physical capital from abroad may result in underemployment in the host country like in the early model of Batra (1986). However, if the inflow of foreign knowledge to the host-country is accompanied by the physical capital inflow and there is diffusion of foreign knowledge among locally-owned firms underemployment in the host country does not have to occur.

The initial allocation of capital and labor between multinational and locally-owned firms can be determined by combining conditions (6)-(8), (11)-(13) and (17)-(18) and solving the following system of three equations for K_X , L_X and L_Y :

$$F_K(K_X, L_X, E(w^*), \bar{S}) = g(\bar{S})G_K(\bar{K}(\bar{S}) - K_X, L_Y, E(w^*)) \quad (34)$$

$$w^* = F_L(K_X, L_X, E(w^*), \bar{S}) \quad (35)$$

$$w^* = g(\bar{S})G_L(\bar{K}(\bar{S}) - K_X, L_Y, E(w^*)) \quad (36)$$

In order to examine how the initial allocation of non-specific factors of production between sector changes in response to the foreign knowledge inflow to the multinational sector we differentiate totally (34)-(36) and obtain the following matrix system:

$$\begin{bmatrix} F_{KK} + g(S)G_{KK} & F_{KL} & -g(S)G_{KL} \\ F_{LK} & F_{LL} & 0 \\ -g(S)G_{LK} & 0 & g(S)G_{LL} \end{bmatrix} \begin{bmatrix} dK_X \\ dL_X \\ dL_Y \end{bmatrix} = \begin{bmatrix} -F_{KS} + g'(S)G_K + g(S)G_{KK}\lambda \\ -F_{LS} \\ -(g'(S)G_L + g(S)G_{LK}\lambda) \end{bmatrix} dS \quad (37)$$

where: $-G_{LL}H_X > 0$ is the determinant of the matrix of second derivatives.

The general solution of the system allows us to determine changes in the allocation of capital and labor between sectors as a result of the transfer of foreign knowledge that is not fully excludable and accompanied by the inflow of physical capital from abroad:

$$\frac{dK_X}{dS} = \frac{G_{LL}(F_{KL}F_{LS} - F_{LL}F_{KS})}{G_{LL}H_X} + \frac{g'(S)F_{LL}(G_K G_{LL} - G_L G_{KL})}{G_{LL}H_X} \quad (38)$$

$$\frac{dL_X}{dS} = \frac{G_{LL}(F_{KL}F_{KS} - F_{KK}F_{LS})}{G_{LL}H_X} - \frac{g'(S)F_{KL}(G_K G_{LL} - G_L G_{KL})}{G_{LL}H_X} \quad (39)$$

$$\frac{dK_Y}{dS} = \frac{dK(S)}{dS} - \frac{dK_X}{dS} = \lambda - \frac{G_{LL}(F_{KL}F_{LS} - F_{LL}F_{KS})}{G_{LL}H_X} + \frac{g'(S)F_{LL}(G_K G_{LL} - G_L G_{KL})}{G_{LL}H_X} \quad (40)$$

$$\frac{dL_Y}{dS} = \frac{G_{LK}(F_{KL}F_{LS} - F_{LL}F_{KS})}{G_{LL}H_X} + \frac{g'(S)F_{LL}(G_K G_{KL} - G_L G_{KK})}{G_{LL}H_X} - \frac{g'(S)G_L}{g(S)G_{LL}} - \frac{G_{LK}}{G_{LL}}\lambda \quad (41)$$

Expressions (38)-(39) describe changes in the employment of non-specific factors of production in the multinational sector. We can notice that the first terms in these two expressions are positive, while the second negative. These terms can be interpreted as follows. On the one hand, the transfer of foreign knowledge to the multinational sector in the host country raises the productivity of capital and labor and leads to an increase in their employment. On the other hand, diffusion of foreign knowledge among locally-owned firms raises also the productivity of non-specific factors employed in the local sector and prevents their reallocation to the multinational sector. However, if diffusion of knowledge is not complete the change in the employment of both capital and labor in the multinational sector, although positive, is smaller than in the original model of Batra (1986) where foreign knowledge was assumed to be fully excludable. Interestingly, unlike in Section 3, now the physical capital inflow from abroad has no impact on the employment of both non-specific factors in the multinational sector.

Expressions (40)-(41) describe changes in the employment of capital and labor in the local sector, respectively. The change in the employment of capital in the local sector equals the difference between the capital inflow from abroad and the change in the employment of capital in the multinational sector resulting from the transfer of foreign knowledge. This difference is the net amount of capital that is reallocated from the local to the multinational sector. It is smaller the larger the inflow of capital from abroad and the greater the diffusion of foreign knowledge among locally-owned firms. The numerator of the expression that describes the change in the employment of labor in the local sector also contains negative and positive terms. The first term is negative as the outflow of capital from the local to the multinational sector decreases the marginal product of capital and given the efficiency wage w^* decreases labor employment in the local sector. Diffusion of foreign knowledge among locally-owned firms affects positively the employment of labor in the local sector through two channels. First, it reduces the outflow of physical capital from the local to the multinational sector. Second, it increases the marginal product of labor in the local sector. The outflow of physical capital from the local sector is also dampened by the capital inflow to the multinational sector from abroad. Hence, unlike in Batra (1986) when $\lambda = 0$ and $g'(S) = 0$, the reduction in the local sector employment, if at all occurs, is smaller.

It can be shown, that in an extreme case when the total amount of physical capital used in the multinational sector is transferred from abroad the fall in the local sector employment will not occur. Instead, the employment in the local sector may increase as the result of the expansion of the multinational sector, if

foreign knowledge is not fully excludable. This can be demonstrated as follows. If the change in the employment of capital in the multinational sector is exactly equal to the change in the stock of physical capital available in the host country accompanying the inflow of foreign knowledge, then the stock of capital employed in the local sector remains unchanged, $dK_X/dS = dK(S)/dS$ and $dK_Y/dS = 0$, when:

$$\lambda = \frac{G_{LL}(F_{KL}F_{LS} - F_{LL}F_{KS})}{G_{LL}H_X} + \frac{g'(S)F_{LL}(G_K G_{LL} - G_L G_{KL})}{G_{LL}H_X} \quad (42)$$

Plugging in the above expression for λ to expression (41) we can calculate the change in the employment of labor in the local sector:

$$\frac{dL_Y}{dS} = -\frac{g'(S)G_L}{g(S)G_{LL}} > 0 \quad (43)$$

Therefore, we can notice that unlike in the benchmark case discussed by Batra (1986), where only foreign knowledge was transferred to the host country, once we allow for the inflow of capital from abroad and the diffusion of foreign knowledge among locally-owned firms the employment of labor in the local sector may remain unchanged or increase instead of falling. If there is diffusion of foreign knowledge among locally-owned firms then the inflow of physical capital from abroad, necessary to keep the employment of labor in the local sector unchanged, does not have to satisfy all the capital needs of the multinational sector. Using (41) we can calculate λ that leaves the employment of labor in the local sector unchanged, $dL_Y/dS = 0$:

$$\lambda = \frac{G_{LL}(F_{KL}F_{LS} - F_{LL}F_{KS})}{G_{LL}H_X} + \frac{g'(S)F_{LL}(G_K G_{LL} - G_L G_{LK})}{G_{LL}H_X} - \frac{g'(S)G_L}{g(S)G_{LK}} \quad (44)$$

Comparing expressions (42) and (44) we can notice that (44) is clearly smaller than (42) if $g'(S) > 0$. The magnitude of the capital inflow from abroad necessary to keep the employment of labor in the local sector unchanged is smaller the stronger is the effect of foreign knowledge diffusion among locally-owned firms, i.e. foreign knowledge is less excludable.

Using (39) and (41) and adding up changes in employment in the multinational and the local sectors we can calculate the change in the total employment of labor in the host country:

$$\frac{dL}{dS} = \frac{A(k_X - k_Y)}{G_{LL}H_X} - \frac{g'(S)B[F_{KL}(k_X - k_Y) + F_{LS}S/L_X]}{G_{LL}H_X} - \frac{g'(S)G_L}{g(S)G_{LL}} - \frac{G_{LK}}{G_{KK}}\lambda \quad (45)$$

where: $A = G_{KL}[F_{KL}(F_{KS} + F_{LS}/k_X) + F_{KS}F_{LS}S/K_X] > 0$, $B = G_{KL}[G_K + G_L/k_Y]$.

We can notice that when the multinational sector is more capital-intensive than the local one, $k_X > k_Y$, there is no capital inflow from abroad, $\lambda = 0$, and no diffusion of foreign knowledge among locally-owned firms, $g'(S) = 0$, then the total employment of labor in the host country will decrease as a result of the foreign knowledge transfer like in the original model of Batra (1986). However, if this knowledge transfer is accompanied by the inflow of physical capital from abroad and foreign knowledge is not fully excludable,

then the total employment of labor in the host country does not have to decrease and underemployment may not occur. This result parallels the findings reported in the theoretical work of Beladi and Choi (1995).

However, unlike in the previous work where underemployment in developing economies was attributed to various labor market imperfections such as institutionally fixed wages, minimum wage regulations or labor unions, in this paper we have demonstrated that underemployment in the host country may arise endogenously as a result of the adoption of efficiency wage schemes by locally-owned firms to prevent the outflow of their employees to the multinational sector.

Finally, let us examine how the national income in the host country changes in response to the expansion of the multinational sector. Assuming that the foreign factor rewards that are fully remitted to the parent country and following a similar procedure as in Section 3, the change in the national income can be expressed as:

$$\frac{dI}{dS} = w^* \frac{dL}{dS} + g'(S)Y - \frac{dF_S}{dS} S - \frac{dr}{dS} K^{Foreign} \quad (46)$$

Like in Section 3 we can notice that this change is equal to the sum of four terms. Assuming that the initial foreign involvement in the host country was small we can neglect the last two terms. However, unlike in the previously discussed case, when only multinational firms were offering efficiency wages to their workers, now the impact of increased multinational involvement on the host country's national income is ambiguous and depends crucially on the change in total employment. If the decrease in total employment is small and the gain due to foreign knowledge diffusion among local firms is large then the national income in the host country does not have to fall. However, if the change in the total employment is positive then the national income in the host country increases irrespectively of the magnitude of foreign knowledge diffusion.

5. Concluding remarks

In this paper we studied the impact of increased foreign involvement in the host country on its labor market and considered two possible scenarios. In the first one, we assumed that multinational firms that entered the host country were offering efficiency wages to motivate their workers while locally-owned firms were paying competitive wages. This led to the emergence of the dual labor market in the host economy where otherwise identical workers were split into two groups: those who were lucky to find employment in the multinational sector and the remaining workers who were less fortunate and stayed in the local sector. We examined three potential effects associated with the expansion of the multinational sector: the transfer of foreign knowledge and the associated technological change, diffusion of this knowledge among locally-owned firms and the inflow of the physical capital from abroad. If the difference in capital intensity between sectors was large, the inflow of capital from abroad was small and foreign knowledge was almost fully excludable wage disparities

between multinational and locally-owned firms were increasing and the average wage level was falling despite increased national income in the host economy. However, if capital inflows from abroad and foreign knowledge diffusion were sufficiently large wages in locally-owned firms could increase reducing the wage dispersion and increasing the average wage level in the host country despite still existing labor market segmentation. In this case the dual labor market emerged endogenously as a result of differences in wage setting schemes in the multinational and the local sectors.

In the second scenario, we assumed that locally-owned firms adjusted their wage setting schemes in order to be able to compete with multinational firms for workers and also started offering efficiency wages to their workers to prevent their outflow to the multinational sector. In this case wages between sectors were equalized but this might result in the emergence of underemployment in the host country. If differences in capital intensity between multinational and locally-owned firms were large, capital inflows from abroad were small and foreign knowledge was excludable, the expansion of the multinational sector resulted in increased unemployment and decreased national income in the host country. Unemployment did not have to increase and income to fall, however, if the transfer of foreign knowledge was accompanied by its diffusion among locally-owned firms and the inflow of physical capital from abroad. In all cases, the results presented in this paper seem to confirm the popular view that greenfield FDI is more beneficial for a developing host economy than takeovers of already existing local firms as greenfield investments are more likely to be associated not only with the transfer of foreign knowledge but also the inflow of physical capital.

The theoretical framework employed in this paper was highly stylized and at least two issues should be addressed in future studies. First, positive knowledge spillovers in this paper were modeled as purely exogenous technological externalities à la Scitovsky (1954). The endogenization of these externalities seems desirable. Second, in this paper we used the simplest version of the efficiency wages model where efficiency wages offered in both sectors of the host economy were exactly the same and independent of one another as well as of any other economic variables such as the rate of unemployment. Therefore, future theoretical work in this area should concentrate on implications of relaxing these restrictive assumptions.

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