Foreign Direct Investment and the labor share in developing countries*

Bruno Decreuse† and Paul Maarek‡
GREQAM, University of Aix-Marseilles II

September 2007

Abstract: In this paper, we suggest that foreign direct investment (FDI) has two opposite effects on the labor share in developing countries. According to the negative *technological rent effect*, foreign firms derive monopsony power on the labor market from their technological advance. According to the positive *wage competition effect*, foreign firms compete with each other to attach labor services. We proceed in two steps. First, we show in a simple search model that the negative effect should dominate at early stages of financial openness, while it should be dominated at later stages. Second, we use macro data for a large panel of non-OECD countries, and assess the empirical validity of such U-shaped relationship between the labor share in manufacturing sector and the ratio of FDI stock to GDP. The regressions include country fixed effects, time dummies, and control for alternative measures of openness. The other determinants of the labor share are in line with the theoretical model: technological gap (-), unemployment rate (-), capital to output ratio (+).

Keywords: Globalization; labor share; matching frictions; wage setting

J.E.L classification: E25; F16. F21

1 Introduction

This paper addresses the impact of financial openness on the share of income accruing to labor in developing countries. We focus on foreign direct investments (FDI). An increase in the proportion of jobs in foreign firms has two conflicting effects on the share of income accruing to labor. According to the negative *technological rent effect*, foreign firms derive monopsony power on the labor market from their

*This paper has benefited from the comments of GREQAM seminar participants, participants to the GREQAM-URMOFIB workshop in Tunis, the meeting on Open Macroeconomics and Development in Aix-en-Provence, and the summer school in Labour Economics in Aix-en-Provence. We especially wish to thank Cecilia Garcia-Penalosa for her suggestions at an early stage of the research, as well as Daniel Ortega and Francesco Rodriguez who helped us to find the labor share data. The usual disclaimer applies.

†Corresponding author. GREQAM, 2, rue de la charité 13236 Marseille cedex 2, France. E-mail: decreuse@univmed.fr

‡GREQAM, 2, rue de la charité 13236 Marseille cedex 2, France. E-mail: maarek@univmed.fr

technological advance. As a result, the labor share tends to decrease with the proportion of foreign firms. According to the positive *wage competition effect*, foreign firms compete with each other to attach labor services. Consequently, the labor share tends to increase with the proportion of foreign firms. We proceed in two steps. On the one hand, we show in a simple search model that the negative effect dominates at early stages of financial openness, while it is dominated at later stages. Hence, there should be a U-shaped relationship between the labor share and the share of foreign firms in the economic activity. On the other hand, we use macro data for a large panel of developing countries, and assess the empirical validity of such U-shaped relationship between the labor share and the ratio of FDI stock to GDP. The other determinants of the labor share are compatible with the theoretical model.

Why is it important? In this paper, we focus on the impact of financial globalization on the factor share distribution of income in developing countries. There are four main motivations. First, studying factor share is important in itself. If capital is concentrated in few hands, factor share movements leads to major changes in personal income inequality. Daudey and García-Peñalosa (2006) for instance show that changes in labor share significantly alter the Gini coefficients. Second, when a large proportion of the capital stock is held by foreigners, they receive a substantial part of income as a result, with unchanged standard of living for the local population. This is especially true when the country fails to design the fiscal tools to tax benefits made by firms financed by foreign capital. Third, to many, trade and financial liberalization have been more profitable to capital than to labor. To quote Sachs (1998): "I would guess that the post-tax income of capital is privileged relative to the post-tax income of labor as a result of globalization and especially globalization that leads to openness of financial markets and not just of trade. For example, both evidence and theoretical logic make it quite clear that union wage premia are driven down by the openness of the world financial system and that the ability of capital to move offshore really does pose limits on the wage-setting or wage-bargaining strategies of trade unions which are restrained in their wage demands by the higher elasticity of labor demand." This perspective has become so widespread that Chapter 5 of the World Economic Outlook (2007) is largely devoted to the (negative) impact of globalization on the labor shares in developed countries.

Developing countries have been hit by two major phenomena during the past decades: a major decrease in the labor share, and rising openness to international trade and international capital market. On the one hand, the fall in labor shares in developing countries is well documented by now. Harrison (2002) for instance estimates that developing countries have experimented a 0.1 point decrease in labor share from 1970 to 1993 and 0.3 point from 1993 to 1996. On the other hand during the same period, developing countries have become more open to international trade and, more closely related to our paper, to international capital flows. Capital flows from developed countries to developing countries were about 10 billions dollars in 1970 to reach 300 billions in 1997 and 500 billions in 2005. At least, FDI inflows from developed countries to the developing world have reached 200 billions dollars in 2000. Rodrik (1997) is one of the first to offer a canvas relating these two phenomena. He argues that increased financial openness has improved the mobility of capital with respect to labor. Such improved mobility translates into higher outside opportunities, which allows capital owners to bargain lower wages at given output. This view has become very popular, increasing the political weight of those who believe, following Rodrik, that globalization has gone too far.

In the recent years, several papers have confirmed Rodrik's predictions, showing that various proxies for globalization negatively affect the labor share of income (see for instance Harrison, 2002, Ortega and Rodriguez, 2002, Jayadev, 2005). Our paper offers three contributions concerning this debate. First, it offers a new factor behind the decrease in the labor share of developing countries. According to this explanation, a substantial part of the decrease has been originated by FDI inflows from developed countries. Second, it claims that there should be a reversal in the relationship between financial openness and the labor share. Third, it tests the empirical validity of such claims on aggregate data.

The intuition can be stated in a very few words. Consider a firm established in a very poor country to extract oil. The value added associated to the productive activity of this firm is substantially higher than the value added generated by a typical local firm. Nevertheless, wages in the foreign firm should not differ so much from wages prevailing in local firms. Indeed, workers' outside opportunities depend on the whole labor market, so that foreign firms do not need to reward workers at their marginal product. Output increases by a lot whereas wages remain quasi constant (or, similarly, do not increase in the same proportion). As a result, the labor share strongly declines. We call this effect the *technological rent effect*, because it hinges on the ability of foreign firms to produce more efficiently than local firms (see for example Harrison and Haddad, 1993, on Moroccan data).

However, economic mechanisms do not stop there. As the country becomes more open to international investments, the proportion of foreign firms (that is firms which ownership structure heavily depends on international investors) in the total number of firms increases. They start competing against each other to attach labor services. As a result, wages increase more rapidly than output, which tends to raise the labor share. We call this effect the *wage competition effect*. We suggest that the technological rent effect dominates at early stages of financial development, while it is dominated by the wage competition effect at later stages.

These different arguments take place within a frictional model of the labor market. Matching frictions help us to account for non-trivial relationships between the proportion of foreign firms and workers' ability to get paid at marginal product while working for such firms. We build a two-sector static model in which local and foreign firms coexist. Foreign and local employers face different entry costs, which are larger for the foreign firms. Such entry cost for the foreign firms parameterizes the degree of financial openness. It is implicitly related to the institutions that shape the attractiveness of the country for the foreign investors. Sectors are perfectly symmetric and are both characterized by frictions on the labor market. Workers search in both sectors. If a worker receives a single offer, he is paid the monopsony wage. If he receives more than one offer, potential employers enter Bertrand competition and the worker goes where the wage offer is the highest. When a foreign firm and a local firm compete, the foreign firm wins the competition. The worker is then paid at the marginal productivity he would have reached if he had been employed by the local firm. When two foreign firms or two local firms compete, the worker obtains full marginal product.

When the proportion of foreign firms is low, the probability to receive two offers emanating from such firms is small. It follows that there is an important discrepancy between output produced by foreign firms, and the wage bill paid to their employees. In such case, a further increase in the proportion of foreign firms deteriorates the labor share. This is the essence of our technological rent effect. When the

proportion of foreign firms is larger, the probability to receive two offers from foreign firms is higher. A further increase in their proportion raises competition between them, and raises the labor share. This is our wage competition effect.

We show that there is a single value of the entry cost that foreign firms face below which an increase in their proportion reduces the labor share, and above which an increase in their proportion raises the labor share. Hence, the relationship between financial openness and the labor share is U-shaped. The labor share is maximized either when there are no foreign firms, or when there are no local firms. Our interpretation of the facts is that most of the developing countries are still in the decreasing part of the curve. Increasing financial openness may well allow them to reach the increasing part.

We also examine the robustness of our model to real-world features like transfer pricing or technological transfers. These features tend to reduce the size of the technological rent effect. Transfer pricing is a way for multinationals to choose where they locate their profits. If some of the profits obtained by foreign firms do not appear in national accounting, the labor share becomes more likely to increase with the proportion of jobs in foreign firms. Similarly, if foreign firms exert positive spillover effects on the productivity of local firms, financial openness decreases the productivity gap between local and foreign firms. This obliges foreign firms to pay higher wages at given output.

Our empirical analysis covers a large panel of developing countries. The labor share variable is taken from the UNIDO dataset. It corresponds to the ratio of total wage bill to GDP in the manufacturing sector. We use the ratio of the stock of inward FDI in percentage of GDP as a proxy for the percentage of jobs in foreign firms. The ratio of local GDP per capita to US GDP per capita is a proxy for the technological gap between local firms and foreign firms. We typically regress the labor share on lagged FDI stock to GDP, lagged FDI stock to GDP squared, lagged proxy for technological gap, lagged ratio of capital to output, and lagged unemployment rate. Our regressions include country-specific fixed effects, time dummies, and also control for popular variables like female participation and the ratio of public spending to GDP. These regressions show a significant U-shaped relationship between the labor share and FDI stock to GDP. This relationship appears very robust to different sensitivity tests (different changes in the dataset, and use of the ratio of FDI stock to total capital stock rather than FDI stock to GDP). However, the threshold above which the labor share starts increasing with FDI is very high, typically 160% of GDP. This suggests that the positive effects related to financial openness may be very difficult to reach. The other determinants of the labor share have the predicted sign: technological gap (-), unemployment rate (-), capital to output ratio (+).

One may wonder whether there exist alternative theories linking changes in labor shares in developing countries to changes in financial openness. Such explanations do exist, but they are not totally convincing. We now examine them carefully. We look at the roles played by trade openness and capital deepness. Then, we get back to Rodrik-type explanations.

Financial openness and trade openness are the two faces of globalization. A phenomenon that we attribute to capital openness may well be induced by trade openness. The HOS model makes the following prediction. Increasing trade openness should deteriorate the labor share in developed economies, but should raise the labor share in developing countries. In line with such prediction, the impact of trade openness in our regressions is typically positive. Financial openness also means easier access to capital.

It is associated to capital deepness. Capital deepness can alter the labor share through changes in capital intensity. In a one-good two-factor economy, an increase in capital-labor ratio leads to an increase in the labor share if and only if capital and labor are substitutes. Duffy and Papagiorgiou (2000) estimate that the elasticity of substitution between labor and capital is lower than one in developing countries. Labor and capital are complements and an increase in capital intensity leads to an increase in the labor share during the development process. Our regressions include the ratio of capital stock to GDP to control for changes in capital intensity. Its impact is either positive or nil, as suggested by the theory. Hence, these two basic explanations fail to account for effective changes in the labor share of developing countries.

Recently, some authors have elaborated on Rodrik's claim (1997), for whom openness hurts workers' bargaining power and makes wages decreasing. This claim is implicitly based on the idea that a decline in wage is associated to a decline in labor share. This is simply not what happens when the firm stays on the labor demand curve. Put otherwise, as far as labor is paid its marginal product, changes in wages do not tell us anything about changes in the labor share. Therefore, models aiming at rationalizing Rodrik's intuition have considered sophisticate bargaining models. Typically, it is assumed that there are rents on the product market created by imperfect competition, and workers and firms' owners bargain over total surplus, including the rents. In such case, any increase in firm's statu quo position reduces the share of the rents accruing to labor, and thus deteriorates the labor share. Harrison (2002) and Ortega and Rodriguez (2002) develop models along these lines. Rodrik-type arguments are based on the threatening effects of capital openness. They do not depend on actual changes in FDI stock. Conversely, the story we tell here only depends on effective movements in foreign capital. To confront the two stories, some of our regressions include a proxy for capital openness. It is the index of financial openness built by Chinn and Ito (2006). Either it is not significant, or it positively affects the labor share.

The rest of the paper is organized as follows. Section 2 introduces our basic model. Section 3 discusses extensions of the model dealing with FDI learning, transfer pricing, technological transfers, and capital choice. Section 4 concludes.

2 The model

2.1 Environment

The model is static. There are two final goods entering preferences symmetrically. Each good is produced within an autonomous sector. There are a continuum of workers normalized to one and a continuum of firms. Workers are homogeneous. Firms are not. Indeed, foreign firms differ from local firms. The labor market is characterized by frictions. Searching for a job is a decentralized activity which is costly and take time. Matching frictions aim at capturing a feature that especially applies to developing countries, the poor ability of people to generate wage competition between potential employers.

Each firm, foreign or local, is endowed with a single job slot. Before searching for a worker and starting to produce, a firm has to pay the entry cost $\chi > 0$. It is a shadow cost involved by the good market regulation as in Blanchard and Giavazzi (2003). The entry cost is proportional to output and differs according to the nationality of the owners. Hence, c_F is the entry cost per unit of output of a foreign

firm, and c_R stands for the entry cost of local firms. We assume that $c_F > c_R$. We believe that such assumptions broadly map the two imperfections at work on the labor and capital market. The cost c_R represents the local difficulties to set up a firm, while the difference between c_F and c_R reveals the degree of financial openness of the country. In this perspective, there is an upper bound on openness, which is perfect when $c_R = c_F$. The amount of output produced by a foreign and a local firm are respectively y_F and y_R with $y_F > y_R$. This reflects the technological advance of foreign firms.

Workers and vacancies meet at the sector level according to the matching technology $M_i = M(u_i, n_i)$. Here u_i stands for the number of job-seekers in sector i and n_i stands for the number of vacancies in the same sector. The matching technology is homogeneous of degree one to ensure that unemployment rate does not depend on the number of traders in the economy. It is also strictly increasing in both arguments and strictly concave. Workers search jobs in both sectors. Hence, $u_1 = u_2 = 1$. Firms choose one sector before opening their vacancy. Given such assumptions, $M(1, n_i) = m(n_i)$ is the probability for a given worker to receive an offer from sector i. It is increasing in n_i. Similarly, $m(n_i)/n_i$ is the probability for a firm to meet a worker. It is decreasing in n_i. We denote by $\eta(n_i) = n_i m'(n_i)/m(n_i) \in (0,1)$ the elasticity of the matching technology vis-à-vis vacancies.

We assume that firms set wages. If a worker receives a unique offer, he is paid the monopsony wage. For simplicity, the market value of outside opportunities is normalized to zero, and so is the monopsony wage. If a worker receives two offers, one from each sector, firms enter Bertrand competition to attach labor services. Hence, the model is static, but it features some of the properties of dynamic models with on-the-job search.

2.2 Labor market equilibrium

Given all our symmetry assumptions, the model only admits symmetric equilibria. This has two implications. First, in equilibrium, the price of the two goods is the same, and we normalize it to one. Second, the proportion of foreign firms in the total number of firms is also the same in each sector. As a result, we can drop indices i specific to sectors.

To solve the model, we first have a look at the determination of wages. The probability to receive a single job offer is $2m(n)(1-m(n))$. Then, the wage is nil and the firm gets the totality of output. The probability to receive two offers is $m(n)^2$. Then, the wage depends on the productivity of the two firms. With probability $(1-\rho)^2$, the two offers emanate from local firms and the worker receives the totality of output y_R. With probability $\rho(1-\rho)$, one of the offers comes from a foreign firm, and the other comes from a local firm. Then , the worker is hired by the foreign firm and his wage is y_R. The firm gets the difference $y_F - y_R$. Finally, with probability ρ^2, the two offers come from foreign firms. Then, the worker gets his marginal product y_F.

Expected profits for the two types of firms are:

$$\pi_F = -c_F y_F + \frac{m(n)}{n}\left[(1-m(n))\, y_F + m(n)(1-\rho)(y_F - y_R)\right] \quad (1)$$

$$\pi_R = -c_R y_R + \frac{m(n)}{n}\left[1-m(n)\right] y_R \quad (2)$$

Given costs of entry, there is free entry of firms in each sector. This means that $\pi_F = \pi_R = 0$, which

gives

$$c_F = \frac{m(n)}{n}\left[1 - m(n) + m(n)(1-\rho)\frac{y_F - y_R}{y_F}\right] \quad (3)$$

$$c_R = \frac{m(n)}{n}\left[1 - m(n)\right] \quad (4)$$

These two equations simultaneously define ρ, the proportion of foreign firm in each sector, and n, the total number of firms in each sector. The system can be solved recursively. The free-entry condition (4) for the local firms determines the market size, that is the total number of firms n. Then, the free-entry condition (3) determines the proportion of foreign firms ρ. It is easy to check that $c_F > c_R$ together with $y_F > y_R$ imply that there exists a unique equilibrium with a non-trivial proportion of foreign firms.

The reason why the total number of firms only depends on the entry cost faced by local firms is the following. If c_F decreases, profits for foreign firms become positive. New foreign firms enter as result. Since c_R remains constant, profit expectations for local firms become negative as they find more difficult to recruit a worker. The number of local firms goes down until the total number of firms goes back to its initial value.

Hence, rising financial openness does not modify the total number of firms, but increases the proportion of jobs in foreign firms – applying the implicit function theorem to equations (3) and (4) shows that $dn/dc_F = 0$ and $d\rho/dc_F < 0$. An increase in productivity gap $(y_F - y_R)/y_R$ has similar effects to an increase in financial openness. It increases the proportion of foreign firms, without impacting the total number of firms.

2.3 Labor share

The total wage bill paid by foreign firms is

$$W_F = m(n)^2 \rho\left[\rho y_F + 2(1-\rho)y_R\right] \quad (5)$$

The wage bill corresponds to workers who receive two offers. This happens with probability $m(n)^2$. With probability ρ^2 the two offers are from foreign firms and the worker receives the totality of output y_R. With probability $2\rho(1-\rho)$, one of the two offers is from a local firm, and the worker gets y_R.

The total wage bill paid by local firms is

$$W_R = m(n)^2 (1-\rho)^2 y_R \quad (6)$$

Wages correspond to workers who receive two offers from local firms.

Total output in foreign firms is

$$Y_F = m(n)\rho\left[2 - m(n)\rho\right] y_F \quad (7)$$

The probability that a worker does not receive a job offer from a foreign firm is $(1 - m(n)\rho)^2$. Therefore, the probability that a worker receives an offer from such firms is $1 - (1 - m(n)\rho)^2$. However, the worker may receive two offers from such firms with probability $m(n)^2\rho^2$. But, only one of the firms hires him. Hence, we have to subtract $m(n)^2\rho^2$. The result follows.

Similarly, total output in local firms is

$$Y_R = m\,(n)\,(1-\rho)\,[2 - m\,(n)\,(1+\rho)]\,y_R \tag{8}$$

Total wage bill is $W = W_F + W_R$, while total output is $Y = Y_F + Y_R$. After simple algebra, we obtain

$$\mathrm{LS} = \frac{W}{Y} = \frac{m\,(n)\,\left[\rho^2 y_F + (1-\rho^2) y_R\right]}{\rho\,[2 - m\,(n)\,\rho]\,y_F + (1-\rho)\,[2 - m\,(n)\,(1+\rho)]\,y_R} \tag{9}$$

2.4 Impact of financial openness on labor share

Financial openness means a decrease in the entry cost paid by foreign firms. The gap between the two costs c_R and c_F is reduced. This only leads to an increase in the proportion of foreign firms in the total number of firms. Then, to capture the impact of financial openness on the labor share, we only need to differentiate LS in equation (9) with respect to ρ. We obtain:

$$\begin{aligned} \tfrac{d\mathrm{LS}}{d\rho} &\overset{sign}{=} -dY/d\rho \times \mathrm{LS} + dW/d\rho \\ &\overset{sign}{=} \underbrace{-(1-\rho m\,(n))\,(y_F - y_R)\,\mathrm{LS}}_{\text{technological gap effect}} + \underbrace{\rho m\,(n)\,(y_F - y_R)}_{\text{wage competition effect}} \end{aligned} \tag{10}$$

Two opposite forces are involved:

·The *technological gap effect* tends to decrease the labor share. An increase in the proportion of foreign firms raises output, as they benefit from better productivity. At given wage, this reduces the labor share. This effect is dependent on the ability of foreign firms to extract a rent on labor thanks to their better technology. It can help us to understand the observed decline in labor shares in developing countries over the past decades.

·The *wage competition effect* tends to increase the labor share. An increase in the proportion of foreign firms raises wage competition between them, which increases wages. At given output, this tends to raise the labor share.

The impact of financial openness on the labor share results from the interplay between these two forces. After simple algebra, we get:

$$\frac{d\mathrm{LS}}{d\rho} \overset{sign}{=} \rho^2 y_F - (1-\rho)^2 y_R \tag{11}$$

Hence, $d\mathrm{LS}/d\rho$ is non monotonous in ρ. It decreases at first, reaches a minimum, and finally increases. The technological rent effect initially dominates, while it is dominated at larger proportion of foreign firms. The threshold proportion of foreign firms ρ^* below (above) which increased financial openness deteriorates (raises) the labor share results from $d\mathrm{LS}/d\rho = 0$. We find

$$\rho^* = \frac{(y_R y_F)^{1/2} - y_R}{y_F - y_R} \tag{12}$$

Interestingly, the labor share is the same when the economy is closed to foreign investors (c_F sufficiently large, which implies that $\rho = 0$), and when it is perfectly open ($c_R = c_F$, which implies that $\rho = 1$). For these two extreme cases:

$$\mathrm{LS} = \frac{m(n)}{2 - m(n)} \tag{13}$$

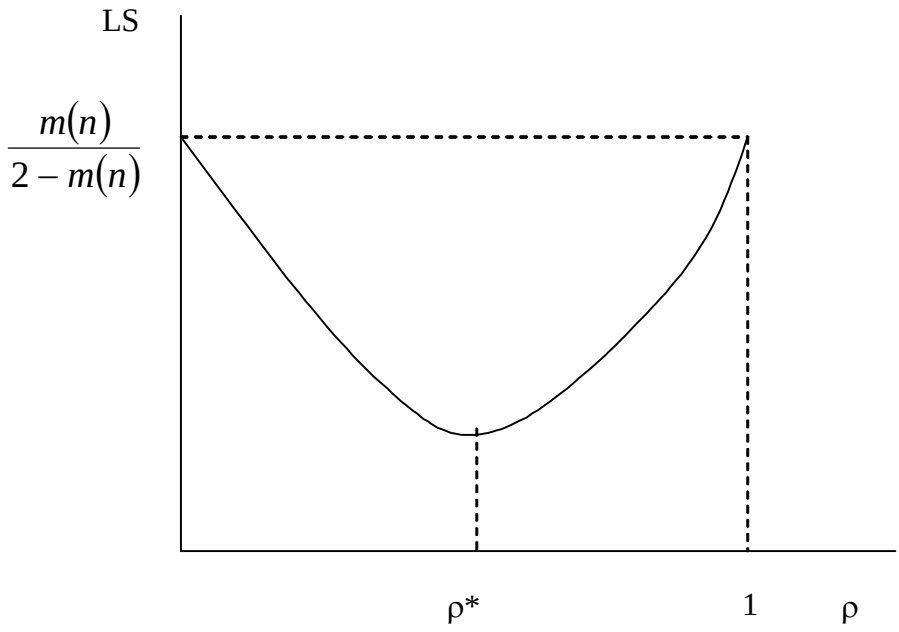

Figure 1: Labor share and proportion of jobs in foreign firms – basic case. LS goes from 0 to 1 as c_F goes from infinity to c_R.

Figure 1 depicts the U-shaped relationship between the proportion of foreign firms and the labor share.

Increasing financial openness means moving along the curve, from the right to the left. The labor share decreases with FDI at early stages of financial openness, while it increases at later stages. Our interpretation of the facts is that many developing countries are still located in the decreasing part of the curve. In accordance with anti-globalization protesters, reducing financial openness is a way to raise the labor share. However, increasing financial openness is another way to lead to the same result, increasing GDP per capita at the same time.

3 Extensions and discussions

This section discusses various aspects of our model. We start by examining changes in the labor share between foreign and local firms. Then, we consider four extensions to our model: FDI learning, transfer pricing, technological transfers, and capital choice.

3.1 Micro predictions

In this sub-section, we examine more carefully wages in local and foreign firms. We first show that foreign firms pay higher wages than local firms. Then, we wonder whether foreign firms pay lower wages per unit of output, and whether they originate a wage externality on local firms. We negatively answer the two questions: the labor share may be higher in foreign firms than in local firms, and the labor share in

local firms goes down with the proportion of foreign firms.

The labor shares in foreign and local firms can be computed from equations (6), (8), (5) and (7). We obtain:

$$\mathrm{LS}_R = \frac{W_R}{Y_R} = \frac{m(1-\rho)}{2-m(1+\rho)} \tag{14}$$

$$\mathrm{LS}_F = \frac{W_F}{Y_F} = \frac{m}{2-m\rho}\frac{2(1-\rho)y_R+\rho y_F}{y_F} \tag{15}$$

Average wage paid by type-i firms is $\overline{w}_i = \mathrm{LS}_i y_i$, $i = R, F$. It follows that $\overline{w}_F > \frac{m}{2-m\rho}(2-\rho)y_R > \overline{w}_R$. Hence, foreign firms pay better wages than local firms do. Interestingly, the labor share may either be higher or lower in foreign firms. Here, two effects compete. The first effect is very intuitive: foreign firms are more productive, which tends to decrease the labor share at given wage. However, they also pay better wages: each time a foreign and a local firm compete to attract a worker, the worker ends up being paid in the foreign firm, while the job is destroyed in the local firm. For instance, when the proportion of foreign firm is very low, $\rho \approx 0$, $\mathrm{LS}_R = m/(2-m)$ and $\mathrm{LS}_F = my_R/y_F$. When the productivity differential is large, $\mathrm{LS}_F < \mathrm{LS}_R$ as the former effect suggests. When the productivity differential is low, $\mathrm{LS}_F > \mathrm{LS}_R$.

It is easy to show that $d\mathrm{LS}_R/d\rho < 0$. The labor share as well as the average wage paid by local firms *decreases* with the proportion of foreign firms. This result is very associated to the imperfections at work on the labor market. Consider a worker that has been contacted by a local firm. With probability $1-m(n)$, he does not receive an alternative offer. In such a case, he works for his local employer and receives the monopsony wage (0). With probability $m(n)$, he receives an alternative offer. With probability $1-\rho$, this offer comes from another local employer. In such a case, the worker is hired by a local firm, and he is paid at marginal product y_R. With probability ρ, the offer comes from a foreign employer. Then, the worker is hired by the foreign firm. To summarize, the probability of being hired by a local firm is equal to $1-m(n)+m(n)(1-\rho) = 1-m(n)\rho$, while the probability of receiving marginal product conditional on being recruited by a local firm is $m(n)(1-\rho)$. The latter probability goes down with proportion of foreign firms, which explains the decline in labor share and average wage in local firms.

Local firms cannot compete with foreign firms to attach labor services. Local firms which survive an increase in the proportion of foreign firms are firms whose workers are more likely not to benefit from any other offer. Consider the case where the proportion of foreign firms is very large, i.e. $\rho \approx 1$. In that case, either the worker does not receive an alternative offer, or he receives an offer from a foreign firm. In the former case, he gets the monopsony wage in the local firm. In the latter case, he works in a foreign firm. Hence, the only workers hired by local firms receive the monopsony wage and the labor share is minimal in such firms (here, 0).

In foreign firms,

$$d\mathrm{LS}_F/d\rho \overset{sign}{=} y_F - (2-m)y_R \tag{16}$$

Hence, the labor share and the average wage paid by foreign firms can either decrease or increase with the proportion of foreign firms. It increases whenever the productivity differential between foreign and

local firms is sufficiently large, and/or the matching probability is sufficiently high. For instance, the labor share increases with ρ when the labor market is competitive ($\rho = 1$).

3.2 Accounting for FDI learning

In this sub-section, we examine the argument according to which the entry of foreign firms makes easier the entry of new firms. This may give birth to multiple equilibria: low equilibria with few FDI, small output, but a high labor share, would coexist with equilibria with large FDI and high output, while the level of the labor share would either be higher or lower. Interestingly, this assumption does not alter the relationship between the labor share and the proportion of foreign firms.

We introduce FDI learning as follows: we assume that the entry cost c_F that foreign firms face is decreasing in ρ. The model is unchanged, but the free-entry equation that defines the proportion of foreign firms. Indeed, the equilibrium vector (ρ, n) now solves:

$$c_F(\rho) = \frac{m(n)}{n}\left[1 - m(n) + m(n)(1-\rho)\frac{y_F - y_R}{y_F}\right] \quad (17)$$

$$c_R = \frac{m(n)}{n}\left[1 - m(n)\right] \quad (18)$$

The total number of firms n remains the same: it only depends on the entry cost c_R that local firms face. The proportion of foreign firms is defined by equation (17). There is a multiplier effect. Indeed, both the right-hand side and the left-hand side of equation (17) are decreasing in ρ. This effect may originate multiple equilibria, with same number of jobs, same unemployment rate, but different proportions of foreign firms. Equilibria have the following properties. First, given that foreign firms are more productive, equilibria in which the proportion of foreign firms is higher are also equilibria in which GDP per capita is higher. Second, given that the relationship between the proportion of foreign firms and the labor share is unchanged, equilibria with a high proportion of foreign firms may feature a higher or lower labor share than equilibria with a low proportion of foreign firms.

This extension has a major implication. Two countries characterized by the same institutions in terms of financial openness may attract very different numbers of foreign firms. It means that institutional measures of financial openness may well be poorly related to the labor share, while direct measures should be much more accurate. In the empirical part of the paper, we mainly focus on such direct measures, even though some of our regressions also include an institutional measure of financial openness among the regressors.

3.3 Accounting for transfer pricing

In this sub-section, we introduce transfer pricing into our model, and examine how it alters the non-monotonous relationship between financial openness and the labor share. We show that either the relationship is qualitatively unchanged, or it is strictly increasing.

In our basic framework, we implicitly assume that firms cannot choose where to locate the value-added. There exists lots of fiscal tools for a multinational firm to locate profits of its subsidiaries where taxation is more profitable. The most famous is probably the transfer pricing method. Consider the

following example. Suppose that a multinational owns a single subsidiary. The subsidiary sells 100 units of an electronic component to the multinational. The price paid by the multinational is \$10 each for a cost of \$5 each paid by the subsidiary. Using the component as input, the multinational produces a final consumption good which is sold \$1500 to the consumers. There are no taxes on profits in the multinational country of origin whereas those taxes are about 50% in the subsidiary's country. So, after-tax multinational profit is \$500, while after-tax subsidiary profit is \$250. Hence, total profit is \$750. Changing the price of the component, the multinational can increase its total profit. For instance, if component had been sold \$5, the total benefit would have been \$1000. Firms transfer the surplus where taxes are low by changing the transfer price of intra-firm trade.

There are legal limits to transfer pricing which is considered as fiscal escape. In developing countries, local authorities do not want to lose fiscal takings which are an important vector of development. In developed countries, custom officers do not want to lose part of tax receipts due to tariffs on international trade. Custom officers are in charge to verify that intra-firm trade is achieved at market prices[1]. However, countries differ in how much they enforce transfer pricing rules, and there is evidence of transfer price manipulation (see Hines, 1997, 1999).

If multinationals use transfer pricing to make profit of their subsidiaries lower, our story may not work any longer. Consider the case of a multinational which opens a subsidiary in a developing country very closed to foreign investments. In our story, output increases by a lot, but wages do not change very much. Hence the labor share goes down. However, if the multinational locates its profits in another country through transfer pricing, the labor share increases, because most of registered production achieved by the subsidiary corresponds to wage payments[2].

Our framework must be enriched to account for profit shifting. We assume that foreign firms can locate a proportion $(1-\lambda)$ of their profits in another country. The model is unchanged, but the definition of output produced by foreign firms. Indeed, the value-added located within the country corresponds to the wage bill plus the share λ of the profits:

$$Y_F = m(n)^2\rho^2 y_F + 2m(n)^2\rho(1-\rho)\left[y_R + \lambda(y_F - y_R)\right] + 2m(n)\rho(1-m(n))\lambda y_F] \tag{19}$$

After simplification, the labor share is worth:

$$\text{LS} = \frac{m(n)\left[\rho^2 y_F + (1-\rho^2)y_R\right]}{(1-\rho)\left[2 - m(n)(1+\rho) + 2m(n)\rho(1-\lambda)\right]y_R + \rho\left[2\lambda - m(n)\rho(2\lambda-1)\right]y_F} \tag{20}$$

It is interesting to understand how the relationship between ρ and LS is altered when λ changes. When the country is closed (i.e. c_F is sufficiently large so that there are only local firms and $\rho = 0$), we have the same result as before:

$$\text{LS}|_{\rho=0} = \frac{m(n)}{2 - m(n)} \tag{21}$$

[1] In case of homogeneous goods, the transfer price can be compared easily to the world market price. Controls are more difficult when the good is very differentiated from competitors. There are two methods in this case. First, if a firm sells the same good to several other firms in the same multinational structure, the transfer price must be the same for all firms. The second method is to apply a mark-up on average cost to define a theoretical transfer price.

[2] Bartelsman and Beetsma (2003) make use of this fact to evaluate the response of profit shifting to changes in corporate taxes in OECD countries.

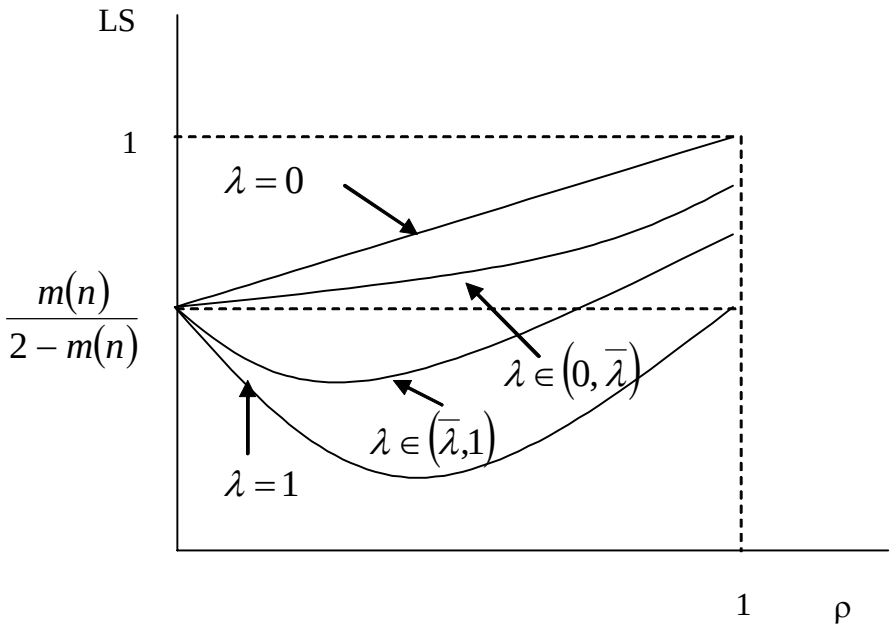

Figure 2: Labor share and proportion of jobs in foreign firms – the role of transfer pricing. Transfer pricing decreases with λ. As far as $\lambda < \overline{\lambda}$, the relationship is strictly increasing.

When the country is perfectly open (i.e. $c_F = c_R$ so that there are only foreign firms and $\rho = 1$), the labor share becomes:

$$\text{LS}|_{\rho=1} = \frac{m(n)}{m(n) + 2(1 - m(n))\lambda} > \text{LS}|_{\rho=0} \tag{22}$$

Hence, the labor share should be larger when the economy is perfectly open than when it is perfectly closed. More generally, transfer-pricing reduces the size of the technological rent effect. This does not alter the qualitative relationship between LS and financial openness unless multinationals manage to relocate their profits massively. In such a case, LS strictly increases with financial openness. Figure 2 depicts the relationship between LS and the proportion of foreign firms as λ increases.

The relationship is U-shaped if and only if

$$\lambda > \frac{1 - m(n)}{(y_F - y_R)/y_R + 1 - m(n)} \equiv \overline{\lambda} \tag{23}$$

One can notice that this condition is more likely to be satisfied when the productivity differential $(y_F - y_R)/y_R$ between foreign and local firms is large.

3.4 Accounting for technological transfers

In this sub-section, we introduce technological transfers from foreign to local firms and examine how they alter the relationship between financial openness and the labor share. We show that as far as foreign firms have positive spillover effects on local firms, the technological rent effect tends to decrease with the size of the spillover effect.

We introduce spillovers as follows: we assume that output produced by local firms depends on the proportion ρ of foreign firms, i.e. $y_R = y_R(\rho)$. The spillover may be either positive – in case of technological transfers – or negative – in case foreign firms reduce the ability of local firms to attract local investors, or destroy the network of connections that local firms have[3].

A positive spillover has a stabilizing effect. An increase in the proportion of foreign firms reduces the technological gap between foreign and local firms. Foreign firms must pay a higher wage as a result, which reduces the incentives to further invest in the country. A negative spillover has a multiplier effect. An increase in the proportion of foreign firms raises the technological gap. Wages go down in foreign firms. This attracts new foreign investors. When this effect is sufficiently strong, there maybe multiple equilibria: equilibria with a large number of foreign firms, and low wages, and equilibria with a low number of foreign firms, and higher wages.

As far as there exists a unique equilibrium, a decrease in entry cost c_F raises the proportion of foreign firms. We can still study the derivative of the labor share with respect to such proportion. It comes:

$$\begin{aligned}\frac{d\mathrm{LS}}{d\rho} &\overset{sign}{=} -\frac{\partial Y}{\partial \rho}\times \mathrm{LS} + \frac{\partial W}{\partial \rho} + \left(-\frac{\partial Y}{\partial y_R}\times \mathrm{LS} + \frac{\partial W}{\partial y_R}\right) y_R'(\rho) \\ &\overset{sign}{=} \underbrace{-(1-\rho m(n))(y_F - y_R)\,\mathrm{LS}}_{\text{technological gap effect}} + \underbrace{\rho m(n)(y_F - y_R)}_{\text{wage competition effect}} + \underbrace{(1-\rho)\{m(1+\rho) - [2 - m(1+\rho)]\,\mathrm{LS}\}\, y_R'(\rho)}_{\text{technological effect}}\end{aligned} \tag{24}$$

As $\mathrm{LS} < m(n)/(2-m(n))$, the technological effect has the sign of $y_R'(\rho)$. The sign as well as the size of the technological transfer effect depends on the sign and magnitude of the spillover. When the spillover is positive, the technological transfer effect tends to reduce the technological gap effect to strengthen the positive relationship between the labor share and financial openness. When the spillover effect is negative, the technological transfer effect tends to magnify the technological gap effect to strengthen the negative relationship between the labor share and financial openness.

This extension delivers a major lesson. If one wants to capture the relationship between the proportion of foreign firms and the labor share, one should also control for the technological differential between foreign and local firms.

3.5 Accounting for capital choice

Our basic model abstracts from capital choice. In this sub-section, we allow firms to set their capital intensity. We also make the difference between foreign and local firms, which may face different capital costs. Provided that the elasticity of substitution between capital and labor is lower than one, financial openness can increase the labor share by raising average capital intensity.

Let k denote capital intensity, and assume that output is $y(k)$, with $y(0) = 0$, $y'(k) > 0$, and $y''(k) < 0$. The elasticity of output with respect to capital intensity is $\alpha(k) \equiv ky'(k)/y(k) \in (0,1)$. The rental cost of capital is asymmetric. Local firms face the price r_R, while foreign firms face the price $r_F \leq r_R$. To simplify, capital investment is made once the worker is recruited. It simply results from the equality between the marginal productivity of capital and its marginal cost:

$$y'(k_i) = r_i,\ i = F, R$$

[3] The evidence is mixed. See for instance Blomström and Kokko (2003) and references therein.

This implies that foreign firms are more productive than local firms, simply because they can invest at lower marginal cost than local competitors. The labor share is worth:

$$\mathrm{LS} = \frac{m(n)\left[\rho^2\left(1-\alpha_F\right)y_F + \left(1-\rho^2\right)\left(1-\alpha_R\right)y_R\right]}{\rho\left[2-m(n)\rho\right]y_F + \left(1-\rho\right)\left[2-m(n)(1+\rho)\right]y_R} \tag{25}$$

where $y_i = y\left(k_i\right)$, and $\alpha_i = \alpha\left(k_i\right)$, $i = F, R$. As r_R tends to r_F, foreign and local firms are no longer differentiated, and the labor share tends to

$$\mathrm{LS} = \left(1-\alpha\left(k\right)\right)\frac{m(n)}{2-m(n)} \tag{26}$$

It is composed of two terms, of which the first is the elasticity of output with respect to labor, and the second accounts for monopsony power derived from search frictions. As $m\left(n\right) \to 1$, the second term tends to one and we are back to the competitive model.

A marginal increase in ρ induced by a marginal decline in c_F has the following impacts:

$$\frac{d\mathrm{LS}}{d\rho} \overset{sign}{=} \underbrace{-\left(1-\rho m\left(n\right)\right)\left(y_F - y_R\right)\mathrm{LS}}_{\text{technological gap effect}} + \underbrace{\rho m\left(n\right)\left[\left(1-\alpha_F\right)y_F - \left(1-\alpha_R\right)y_R\right]}_{\text{wage competition effect}} \tag{27}$$

The wage competition effect now depends on competitive wage differential $\left(1-\alpha_F\right)y_F - \left(1-\alpha_R\right)y_R$, rather than output differential $y_F - y_R$. Given that $k_F > k_R$, $\alpha_R > \alpha_F$ whenever the elasticity of substitution between capital and labor is lower than one. Hence, the wage competition effect is magnified when capital and labor are complementary in output. This point has important implications for empirical analysis. Indeed, in the empirical part of the paper (next section), changes in ρ are captured by changes in FDI stock to GDP ratio. This means that changes in ρ and changes in total capital held by foreign firms are observationally equivalent. This may induce a spurious positive impact of FDI stock to GDP ratio on the labor share: an increase in such ratio may simply raise aggregate capital intensity. It follows that it is important to control for changes in aggregate capital intensity while trying to find an empirical relationship between the proportion of foreign firms and the labor share. In the empirical part of the paper, regressions include a proxy for aggregate capital intensity.

4 Empirical analysis

The purpose of this section is to assess the empirical validity of a U-shaped relationship between the size of economic activity due to foreign firms and the labor share. We use panel data covering 89 developing countries for all income groups defined by the World Bank from 1980 to 2000. Our regressions show that the stock of inward FDI to GDP or to total capital stock has a non-monotonous impact on the labor share: decreasing at first, and then increasing. However, the threshold above which the labor share starts increasing with FDI is very high. The other determinants of the labor share are in line with the theoretical model, especially the technological gap (-), unemployment rate (-), and capital intensity (+).

4.1 Data

The data set covers 89 developing countries over the period 1980-2000. Our preferred estimates are achieved on yearly data to keep the maximum number of observations, but we also run regressions with

data average over four-year periods to control for cyclical effects. The number of observations depends on the number of variables included in the regression. The basic regression with country fixed effects, FDI stock and a proxy for the technological gap is run over 1087 observations. Adding controls lowers the number of observations according to data availability. Data sources are detailed in the Appendix.

4.1.1 Labor share

The dependent variable of our empirical analysis is the labor share. Following Ortega and Rodriguez (2002, 2006), and Daudey (2005), we compute it from the UNIDO dataset. This dataset only covers the manufacturing sector. The data are collected through a survey in more than 180 countries and cover a period from 1963 to 2003 (with gap). There are several reasons why we use the UNIDO dataset. First, UNIDO harmonizes data definitions and computations across countries. Second, this dataset allows to abstract from changes in the sectorial composition of output. As suggested by Gollin (2002), such changes do occur during the development process. If the labor share differs across sectors, changes in the sectorial composition of output modify the aggregate labor share in a rather mechanical way. Third, the UNIDO dataset minors the measurement problems associated with self-employment[4]. There are very few self-employed workers in the manufacturing sector. Furthermore, there is a cut-off concerning the number of employees under which the firm is excluded from the survey.

Our dataset covers both OECD and non-OECD countries. To distinguish developing from developed countries, we use the World Bank classification for 2005. We consider the set of lower, lower-middle and upper-middle income classes. We add four East-Asian countries belonging to the high income class in 2005, but whose development process has been astonishing: Singapore, South Korea, Hong Kong and Taiwan.

4.1.2 Model variables

The key explicative variable in our model is the proportion of jobs in foreign firms. This variable is available, but only for high income countries. We use two different proxies: the ratio of (inward) FDI stock to GDP (FDI/Y), and the ratio of FDI stock to total capital stock (FDI/K). The former ratio is available from the UNCTAD for 200 countries over the period 1980-2005. The latter ratio is computed from UNCTAD data on FDI stock and capital stock. The choice of FDI stock has been made on the basis of two considerations. First, FDI refers to equity participation over 10%. Such investments indicate that foreign investors play an active role in the management of the firm. These firms are more likely to benefit from technological advance. Of course, other firms may also benefit from foreign investment. The presumption here is that the percentage of jobs concerned by our analysis is highly correlated with the ratio of FDI stock to GDP and/or the ratio of FDI stock to capital. Second, FDI stock allow us to deal with endogeneity issues. In our static model, the U-shaped relationship between FDI and the labor share

[4] The labor share is the ratio of wage bill to value-added. The self-employed contribute to the denominator, but typically do not appear in the denominator. There are several ways to impute a fictious wage to the self-employed (see Bernanke and Gürkayanak, 2002, and Gollin, 2002). These methods require strong assumptions on such fictious wage, as well as data on self-employment. Focusing on the manufacturing sector has a major advantage, because it does not require to manipulate the gross wage bill to output ratio.

is not a causal relationship. In the real world, FDI flows depend on the labor share, while the labor share depends on FDI stock – a weighted sum of past investments. Current FDI stock and, better, lagged FDI stock should not be endogenous to the labor share.

Stocks are computed from the historical record of FDI inflows given by the balance of payments. Capital account data have been recently criticized on the ground that they fail to account for the valuation effect[5]. We thus also use data on FDI stocks provided by Lane and Milesi-Ferretti (2006), which correct for the valuation effect. These data are available over the longer period 1970-2005 and allow us to test the robustness of our results.

The theoretical model suggests that the impact of FDI on the labor share depends on the technological gap TG= $(y_F - y_R)/y_F$ between the host economy which receives FDI and the home-based transnational firm. Unfortunately, there are no statistics for the mean productivity differential y_R/y_F between local and foreign firms. As a proxy for this variable, we use the ratio of local GDP per capita to US GDP per capita, both measured in purchasing power parity. Hence, the technological gap variable is measured by one minus the latter ratio. Data on GDP per capita come from the World Bank.

The labor share also depends on the matching probability $m(n)$. This probability shapes workers' ability to generate wage competition for their services. This probability is not available as such. However, we use the following property of our model. The probability to remain unemployed coincides with the unemployment rate. It is equal to UNR= $(1 - m(n))^2$. Hence, we use the unemployment rate as a proxy for (one minus) the matching probability. The unemployment rate is provided by the World Bank. Unfortunately, it only covers 61 countries, which reduces the interest of such variable.

Finally, it is important to separate the impact of FDI from changes in overall capital intensity. To abstract from labor productivity gains, we consider the ratio of capital stock to output K/Y rather than the ratio of capital stock to labor. The former ratio is governed by changes in the ratio of capital stock to effective units of labor. Data on the capital stock come from the UNCTAD.

4.1.3 Control variables

Our regressions include several control variables that do not appear in our model, but which have been highlighted by previous studies. We consider three sets of control variables.

First, we focus on control variables that allow us to test the relevance of our idea with respect to other arguments related the labor share to openness. Our theory hinges on the fact that effective changes in FDI stock alter the labor share. Alternative theories suggest that trade openness is the main responsible for changes in the labor share, that the possibility to relocate the capital stock elsewhere is more important that effective changes, or that changes in the total mass of foreign capital (including portfolio investments) matters. We thus include a measure of trade openness (OPENT, the usual openness degree, that is the ratio of imports plus exports to GDP provided by the Penn Tables), a measure of capital account openness (OPENK) that does not depend on effective changes (the composite index constructed by Chinn and Ito, 2006, which makes use of IMF data concerning the different restrictions on capital account transactions), and a measure of total foreign capital stock (total liabilities provided by Lane and Milesi-Ferretti, ibid).

[5] When a country is indebted in foreign money (dollars), changes in parity alter the debt level. This phenomenon is very large for the US.

Diwan (2000a) also shows that the labor share falls during financial crises. We follow him and build a dummy variable (CRISIS) that takes the value 1 when the exchange rate falls by more than 25%.

Second, we include two control variables that are complementary to our story. Following Harrison (2002), we add in regressions the ratio of Government final consumption expenditure to GDP (GOVEXP). This variable is a proxy for Government intervention, and is provided by the World Bank. Following Finnoff and Jayadev (2006), we also add female participation in the labor force (FEMPART).

Third, we consider the ratio of portfolio investments to GDP (PORT/Y) or portfolio to capital stock (PORT/K) rather than FDI stock to GDP or FDI stock to capital stock. This allows us to test the validity of our story. Indeed, FDI are distinct from portfolio investments because they aim at controlling the entity which receives the investment. For our purpose, FDI seem more relevant, because they indicate that foreign investors play an active role in the management of the firm. Such firms are thus more likely to benefit from a better productivity. By contrast, portfolio investments should not alter the labor share.

Descriptive statistics for the core variables used in our regressions are shown in Table 1.

TABLE 1

4.2 Main regressions

Let i denote the country and t the period. We aim to estimate the following equation

$$\mathrm{LS}_{it} = a_i^0 + a_t^1 + a^2 \mathrm{FDI/Y}_{it} + a^3 \left(\mathrm{FDI/Y}_{it}\right)^2 + a^4 \mathrm{TG}_{it} + a^5 \mathrm{UNR}_{it} + a^6 \mathrm{K/Y}_{it} + a^6 X_{it} + \varepsilon_{it} \qquad (28)$$

where a_i^0 is the country-fixed effect, a_1^t is a period dummy, and X is the set of control variables. The validation of our model requires that $a^2 < 0$, $a^3 > 0$, $a^4 < 0$, $a^5 < 0$.

Table 2 depicts our main results. Each column is associated to a particular specification. In column a, we estimate the relationship without controlling for the unemployment rate, capital intensity, the various controls in X, and time dummies. In column b, we include the unemployment rate – and lose half of the observations. In column c, we add time dummies. In column d to g, regressors are one-period lagged.

TABLE 2

The results can be commented along five dimensions.

First, the estimations validate the existence of a U-shaped relationship between FDI/Y and the labor share. The coefficient associated to FDI/Y is negative, while the coefficient associated to $\mathrm{FDI/Y}^2$ is negative. This relationship is robust to country fixed-effects, time dummies, and to our different control variables. It tells us that FDI have at least two opposite effects on the labor share, in line with our theoretical model. However, our estimates also imply that the threshold above which an increase in FDI stock to GDP starts increasing the labor share is very high. This threshold can be computed as follows: $-a^2/\left(2a^3\right)$. It varies between 160% and 200%. This is far above the mean ratio in developing countries, yet a small proportion of our sample of countries have managed to reach such ratio. There is an important lesson that can be derived from our estimates: the labor share cost of FDI decreases with the ratio of

FDI stock to GDP. As financial openness raises, workers are more and more able to capture part of the gains induced by FDI.

Second, the two other variables that our model emphasizes have the predicted negative impact. The unemployment rate (UNR) is not significant in regressions (b) and (c). However, it turns significant once the estimates are achieved on lagged regressors. This is in line with our theoretical model which suggests that there is a potential endogeneity bias. Hence, high unemployment rates in DC clearly handicap workers' ability to obtain high wages. In all regressions, the technological gap (TG) has a negative sign, in line with our argument whereby foreign firms use their technological advance to derive extra rents on the labor market. This effect is quite substantial. For instance, a country whose GDP per capita is half the US one suffers from a fall in labor share that amounts to about 10 to 15 points. However, TG is highly correlated to GDP per capita, which means that TG captures a variety of factors that are embodied in GDP per capita.

Third, the parameter associated to capital intensity (K/Y) has a positive and significant sign. This indicates that the elasticity of substitution between capital and labor is lower than one. The fact that capital and labor are complementary in output is not controversial, at least in developing countries (see for instance Duffy and Papageorgiou, 2000). Interestingly, the positive impact of capital intensity does not affect the magnitude and significance of the parameter associated to FDI/Y^2.

Fourth, other variables related to openness are interesting to comment. The trade ratio has a positive impact, as suggested by the HOS theory of international trade. Indeed, labor is abundant in DC. Hence, it should benefit from international trade with developed countries. The index of financial openness has a positive impact, suggesting that the negative effects of capital globalization transits more through effective capital flows rather than potential flows.

Finally, government intervention GOVEXP and female participation FEMPART have a positive impact. The former result is in line with Harrison (2002). The latter complements Finoff and Jayadev (2006), who show that female participation tends to raise the labor share in developed economies. Doing so, they argue that they expect to be on the increasing part of a U-shaped curve parameterized by development level – that is, the labor share should go down with feminization of the workforce in developing countries, while it should go up in developed countries.

4.3 Sensitivity analysis

In this sub-section, we examine the robustness of our results. We proceed in two steps. First, we consider various definitions of the FDI variable. Second, we extend our dataset to OECD countries, we use portfolio investments rather than FDI, we estimate our model on 4-year mean data rather than yearly data, and we estimate a probit version of the regression.

In Table 3, we consider several alterations in the main explicative variable, i.e. the ratio of FDI stock to GDP. Column a reproduces our benchmark regression: FDI stock is from UNCTAD, and it is divided by GDP. In column b, FDI stock is from Lane and Milesi-Ferretti (2006) – hereafter LMF. In column c and d, the two FDI stock variables are divided by the total capital stock rather than GDP. Results are qualitatively unchanged: all the different parameters have the same sign and significance.

TABLE 3

Table 4a shows different sensitivity tests in the case where the FDI variable is the ratio of FDI stock to GDP. In column a and b, regressions are run on developed rather than developing countries. The parameters associated to the FDI variable are non-significant. In column c, FDI are replaced by portfolio investment, which is non-significant too. In columns d and e, we consider 4-year mean data rather than yearly data. Such regressions are not very meaningful, given the very low number of countries and observations. However, the P-values of the estimated parameters associated to FDI/Y and FDI/Y^2 are surprisingly high. Consistent with this, regressions, not reported here, have been run on 2-year and 3-year averages: the magnitude of parameters is unchanged, while their significance increases. Finally, columns f and g consider a probit transformation of the labor share variable[6]. It does not affect the parameter estimates in the case of UNCTAD data, while parameters become non significant in the case of LMF data.

TABLE 4a

Table 4b shows similar tests in the case where the FDI variable is the ratio of FDI stock to total capital stock. The results are very similar to Table 4a.

TABLE 4b

4.4 Globalization and labor shares

The point made by our empirical analysis is not methodological. Several studies perform regressions of aggregate labor shares variables on a bulk of factors, of which many of them are incorporated into our own regressions. In addition, several of these studies are preoccupied by the effects of globalization on the labor share of income. Rather, we aim to shed light on a particular factor – namely, the ratio of FDI stock to GDP (or, equivalently, to capital stock) – to assess the existence of the U-shaped curve at the center of this paper. However, doing so we participate to the ongoing debate on the effects of globalization on the labor share of income. The purpose of this sub-section is to cleanly explain the differences and similarities between the different studies, whereby highlighting the strengths (and weaknesses) of our own.

Table 5 describes the main properties of the different studies: main labor share variables, sample of countries, FDI variables, other openness variables, main focus, and regression specifications (if any).

TABLE 5

[6] Ortega and Rodriguez (2002) run all their regressions with that transformation. The dependent variable is $\ln\left[(1-\mathrm{LS})/\mathrm{LS}\right]$ rather than LS.

The particularities of our regressions are the following: they concern developing countries, they use the ratio of FDI stock to GDP or capital stock, they control for institutional capital openness and trade ratio. Many other studies only deal with developed countries, or do not address the globalization issue, or only consider a subset of openness variables.

Table 6 focuses on the subset of papers that deal with globalization.

TABLE 6

Harrison (2002) is the only paper that uses FDI/Y in the regression. She considers FDI flows rather than FDI stocks, which creates a problem of endogeneity that she addresses later by means of IV regressions. Her main result is fully consistent with ours: FDI/Y tend to lower the labor share. Quoting her: "We anticipated that FDI inflows would be a good measure of alternative returns to capital elsewhere. Consequently, we expected that an increase in inflows suggests low alternative returns to capital elsewhere, raising labor's share. Instead, the coefficient on FDI inflows is negative and statistically significant, which is puzzling." The key novelty of our paper hinges on the fact that we not only have a simple explanation, but we also predict a reversal in the impact of FDI on the labor share.

Our theory does not predict anything regarding trade flows. The negative impact in developed countries is consensual among the different studies reported by Table 2. The evidence is less clear in developing countries since Harrison (2002) and Ortega and Rodriguez (2002) obtain a negative coefficient. However, trade flows are associated to multinationals. It is thus difficult to disentangle the impact of trade from the impact of foreign firms. For reasons discussed below, the impact of foreign firms can be captured by the ratio of FDI stock to GDP (or capital stock), while Harrison only considers flows, and Ortega and Rodriguez do not control for FDI variables. We conclude that reported negative impact of trade ratio may actually reveal the negative impact of FDI stock that we highlight throughout the paper.

Other studies point out that capital account liberalization can deteriorate the labor share through increased capital mobility, thereby improving the bargaining position of capital owners. In line with such theory, they report positive impacts of capital controls. Our paper suggests that such effects of capital openness should disappear once we account for actual changes in capital flows. And, indeed, we report positive estimates for our proxy for capital openness.

Finally, exchange rate crises always have a negative impact on the labor share (see Table 7). However, the magnitude of this impact varies from 5 points in the early estimates of Diwan (2000a), to 1 to 2 points in Harrison (2002) and in our study. The latter studies control for changes in foreign capital and capital intensity. This suggests that a large share of the impact of the crisis is due to changes in the level and composition of capital stock.

TABLE 7

5 Conclusion

This paper examines the impact of Foreign Direct Investment on the labor share of income in developing countries. It is based on a simple idea: an increase in the proportion of jobs in foreign firms entails two effects. According to the technological rent effect, foreign firms derive market power from their technological advance. This allows them to pay the workers less than marginal product, and the labor share goes down. According to the wage competition effect, the intensity of wage competition between foreign firms to attach labor services becomes stronger, and the labor share goes up. We suggest that the technological rent effect dominates at early stages of financial openness, while it is dominated by the wage competition effect at later stages. Hence, the relationship between foreign investment and the labor share should be U-shaped.

We examine the validity of this idea in two steps. First, we offer a simple search-theoretic model of the labor market that puts forward the two effects marked above. In our model, the labor share of income is non-monotonous and strictly concave in the (endogenous) proportion of jobs in foreign firms. It is also negatively affected by the technological gap between foreign firms and local firms, as well as negatively impacted by magnitude of search frictions. Second, we test the predictions of our model on a large panel of developing countries. The labor share variable is the ratio of wage bill to value-added in the manufacturing sector. We show that there exists a U-shaped relationship between the labor share and the ratio of FDI stock to GDP. The other determinants of the labor share suggested by the theoretical model have the predicted sign: technological gap (-), unemployment rate (-), capital to output ratio (+).Our regressions control for country fixed effects, time effects and other popular variables that can affect the labor share.

The policy implications of our work is mixed. On the one hand, we show that there should be a reversal in the negative impact of foreign investment on the labor share. This argues in favour of increased financial openness rather than in favour of reduced financial openness. On the other hand, the threshold above which the labor share starts increasing with FDI stock is very high, typically in the range 160%-200% of GDP – far above the mean ratio in developing countries. However, this suggests that the most important effects of FDI on the labor share arise at early stages of financial openness. Such negative effects should not be considered at the time of evaluating the impact of a further increase in financial openness, unless one is willing to considerably overestimate them.

In future work, we plan to measure the two effects highlighted in this paper at the micro level. We want to use survey data to understand the dynamic effects of FDI on the wage bill, accounting for potential spillover and composition effects. We also want to understand why FDI generally stop before the point at which there is a reversal in the labor share. This involves both Government strategies of financial openness and multinationals' strategies of allocating capital worldwide.

References

[1] Bartelsman, E.J., Beetsma, R., 2003, Why pay more? Corporate tax avoidance through transfer pricing in OECD countries. Journal of Public Economics 87, 2225-2252

[2] Bernanke, B.S., Gürkaynak, R.S, 2001. Is growth exogenous? Taking Mankiw, Romer, and Weil seriously. In B.S. Bernanke and K. Rogoff (eds.) NBER Macroeconomics Annual (Cambridge, MA: MIT Press), 11-57

[3] Blanchard, O.J., Giavazzi, F., 2003. Macroeconomic effects of regulation and deregulation on goods and labor markets. Quarterly Journal of Economics 118, 879-908

[4] Blomström, M., Kokko, A., 2003.The Economics of Foreign Direct Investment incentives. Mimeo

[5] Chinn, M., Ito, H., 2006. Notes on the calculation of the Chinn-Ito financial openness variable. Mimeo

[6] Daudey, E., Decreuse, B., 2006. Higher education, employers' monopsony power and the labor share in the OECD countries. Greqam WP 2006-13

[7] Daudey, E., Garcia Penalosa, C., forthcoming. The personal and the factor distributions of income in a cross-section of countries. Journal of Development Studies

[8] Daudey, E., 2003. The sharing of value-added: data sources. Mimeo

[9] Diwan, I., 2000a. Debt as sweat: labor, financial crises, and the globalization of capital. Mimeo

[10] Diwan, I., 2000b. Labor shares and globalization. Mimeo

[11] Duffy, J., Papagiorgiou, C., 2000. A cross-country empirical investigation of the aggregate production function specification. Journal of Economic Growth 5, 87-120

[12] Finnoff, K., Jayadev, A., 2006. Feminization and the labor share of income. GEM-IWG WP No 06-4

[13] Gollin, D., 2001. Getting income shares right. Journal of Political Economy 110, 458-475

[14] Guscina, A., 2006. Effects of globalization on labor's share in national income. IMF Working Paper 06/294

[15] Harrison, A.E., 2002. Has globalization eroded labor's share? Some cross-country evidence. Mimeo

[16] Harrison, A.E., McMillan, M., 2003. Does direct foreign investment affect domestic firm constraints? Journal of International Economics 61, 73-100

[17] Harrison, A.E., Haddad, M., 1993. Are there positive spillovers from direct foreign investment? Evidence from panel data Morocco. Journal of Development Economics 42, 51-74

[18] Hines, J.R., 1997. Tax policy and the activities of multinational corporations. In Auerbach, A.J., Ed., Fiscal Policy: Lessons from Economic Research, Cambridge, M.I.T. Press

[19] Hines, J.R., 1999. Lessons from behavioral responses to international taxation. National Tax Journal 52, 305-332

[20] IMF, World Economic Outlook, Chapter 5.

[21] Jayadev, A., Lee, K., 2003. Capital account liberalization, growth and the labor share of income: reviewing and extending the cross country evidence. Mimeo

[22] Jayadev, A., 2005.

[23] Lane, Ph., Milesi-Ferretti, G.M., 2006. The external wealth of nations mark II: revised and extended estimates of foreign assets and liabilities, 1970–2004

[24] Ortega, D., Rodriguez, F., 2002. Openness and factor shares. Mimeo

[25] Ortega, D., Rodriguez, F., 2005. Trade policy and factor prices: an empirical strategy. Wesleyan Economics WP 2005-004

[26] Ortega, D., Rodriguez, F., 2006. Are capital shares higher in poor countries? Evidence from industrial surveys. Wesleyan Economics WP 2006-023

[27] Pissarides, C., 2000. Equilibrium Unemployment Theory. MIT Press, 2nd edition

[28] Rodrik, D., 1997. Has globalization gone too fare? Institute for International Economics

[29] Sachs, J., 1998. Globalization and employment. A public lecture for the international institute for labor studies.

APPENDIX

- FDI/Y = Ratio of Foreign Direct Investment stock to GDP

  Source: UNCTAD and Lane and Milesi-Ferretti (2006)

  Data available at http://www.imf.org/external/pubs/ft/wp/2006/data/wp0669.zip

- FDI/K = Ratio of Foreign Direct Investment stock to total capital stock

  Source: UNCTAD and Lane and Milesi-Ferretti (2006)

  Data available at http://www.imf.org/external/pubs/ft/wp/2006/data/wp0669.zip

- FEMPART = Percentage of female in the total labor force

  Source: World bank. World development indicators 2005

- GOVEXP = Ratio of government final consumption expenditure to GDP

  Source: World bank. World development indicators 2005

- K/Y = Ratio of total capital stock to total GDP

  Source: UNCTAD

- LS: Labor share = Ratio of wages and salaries to value added ($\times 100$)

  source: UNIDO industrial statistics database INSTAD3 2005 ISIC Rev.2

- OPENK: Ito and Chinn financial openness index. Composite index varying between 2.62 (very open) and -1.75 (close). It is based on four dummy variables reflecting the four major categories on the restrictions on external accounts (IMF 1996). These variables are the presence of multiple exchange rate, restrictions on current account transactions, restrictions on capital account transactions, the requirement of the surrender of export proceed.

  Source: Ito and Chinn (2005)

- OPENT = Ratio of total exports and imports to GDP

  Source: World bank. World development indicators 2005

- PORT/Y = Ratio of Portfolio Investment to GDP

  Source: Lane and Milesi-Ferretti (2006)

  Data available at http://www.imf.org/external/pubs/ft/wp/2006/data/wp0669.zip

- PORT/K = Ratio of Portfolio Investment to total capital stock

  Source: UNCTAD and Lane and Milesi-Ferretti (2006)

  Data available at http://www.imf.org/external/pubs/ft/wp/2006/data/wp0669.zip

- TG: Technological gap = Percentage gap between local GDP (PPP) per capita and US GDP per capita ($\times 100$)

  Source: World bank. World development indicators 2005

- UNR: Unemployment rate = Ratio of unemployed workers to total labor force

  Source: World bank. World development indicators 2005

Table 1: Descriptive statistics of the main variables used in regressions

Variables	Obs	Groups	Mean	Stand dev	Min	Max
Labor share (LS)	2140	111	32.99	12.43	2.23	85.33
Foreign Direct Investment stock						
FDI/PIB (FDI/Y, UNCTAD)	1131	97	19.37	30.33	0	275.44
FDI/PIB (FDI/Y, Lane Milesi-Ferreti)	1547	82	16.92	24.94	0	275.44
FDI/capital (FDI/K, UNCTAD)	1120	96	89.19	128.51	0	1510.16
FDI/capital (FDI/K, Lane Milesi-Ferreti)	1523	81	81.59	106.45	0	1021.55
Controls						
Technological gap (TG)	1371	91	81.58	14.82	22.47	98.5
Unemployment rate (UNR)	571	65	9.34	6.23	1.1	42.2
Capital output ratio (K/Y)	1689	100	22.53	13.27	2.58	338.23
Government expenditure (GOVEXP)	1855	98	14.38	6.47	3.13	94.23
Female participation (FEMPART)	2042	101	34.49	9.85	10.82	50.94
Portfolio Investment stock/PIB (PORT/Y)	1520	82	0.013	0.052	0	0.83
Portfolio Investment stock/capital (PORT/K)	1492	81	5.37	19.36	0	309.68
Trade openness index (OPENT))	1808	97	66.88	41.48	6.32	294.65
Financial openness index (OPENK)	1541	91	-0.38	1.29	-1.75	2.62

Note: for sources and/or calculations see Appendix

Table 2: Main regressions

Specification	(a)	(b)	(c)	(d)	(e)	(f)	(g)
FDI/Y	-0.220***	-0.239***	-0.216***	-0.201***	-0.203***	-0.170***	-0.166**
	(0.036)	(0.0464)	(0.051)	(0.054)	(0.054)	(0.051)	(0.066)
$(FDI/Y)^2$	0.00069***	0.00066***	0.00055***	0.00053***	0.00053***	0.00041**	0.00042*
	(0.00013)	(0.00016)	(0.00017)	(0.00018)	(0.00018)	(0.00017)	(0.00021)
TG	-0.217***	-0.314***	-0.338***	-0.270***	-0.250***	-0.352***	-0.335***
	(0.072)	(0.0873)	(0.088)	(0.090)	(0.091)	(0.088)	(0.121)
UNR		-0.041	-0.130	-0.345**	-0.219	-0.369**	-0.373**
		(0.1171)	(0.117)	(0.138)	(0.150)	(0.146))	(0.163)
K/Y					0.166**	0.170**	0.229**
					(0.080)	(0.075)	(0.089)
GOVEXP						0.391***	0.435***
						(0.139)	(0.157)
FEMPART						1.736***	1.773***
						(0.333)	(0.360)
OPENK							1.409***
							(0.547)
OPENT							0.066**
							0.026
Fixed effects	yes	yes	yes	yes		yes	yes
Time dummies	no	no	yes	yes		yes	yes
R-squared	0.047	0.081	0.193	0.218	0.226	0.330	0.365
No observations	1079	543	543	475	475	472	405
No countries	88	61	61	54	54	54	48

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in brackets.
In regressions (d) to (g), all regressors are one-period lagged.

Table 3: Changes in FDI data

	(a)	(b)	(c)	(d)
Data	UNCTAD	LMF	UNCTAD	LMF
FDI/Y	-0.166**	-0.233***		
	(0.066)	(0.060)		
$(FDI/Y)^2$	0.00042*	0.00050***		
	(0.00021)	(0.00018)		
FDI/K			-0.045***	-0.052***
			(0.013)	(0.012)
$(FDI/K)^2$			0.000030**	0.000028**
			(0.000012)	(0.000011)
TG	-0.335***	-0.450***	-0.327***	-0.396***
	(0.121)	(0.119)	(0.119)	(0.113)
UNR	-0.373**	-0.276*	-0.323**	-0.167
	(0.163)	(0.157)	(0.161)	(0.159)
K/Y	0.229**	0.086	0.100	-0.048
	(0.089)	(0.083)	(0.091)	(0.090)
GOVEXP	0.435***	0.684***	0.433***	0.715***
	(0.157)	(0.147)	(0.155)	(0.145)
FEMPART	1.773***	1.594***	1.775***	1.604***
	(0.360)	(0.341)	(0.356)	(0.336)
OPENK	1.409***	1.560***	1.360**	1.534***
	(0.547)	(0.500)	(0.539)	(0.493)
OPENT	0.066**	0.106***	0.065**	0.097***
	0.026	(0.028)	(0.026)	(0.026)
Fixed effects	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes
R-squared	0.365	0.354	0.378	0.370
No observations	405	388	405	388
No countries	48	47	48	47

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%.
Standard errors in brackets. All regressors are one-period lagged.

Table 4a: Sensitivity analysis - FDI/Y

Specification	(a) Developed	(b) Developed	(c) Portfolio	(d) 4-year	(e) 4-year	(f) Probit	(g) Probit
Data	UNCTAD	LMF	LMF	UNCTAD	LMF	UNCTAD	LMF
FDI/Y	0.0043	0.202		-0.655**	-0.892***	-0.0046	-0.010***
	(0.044)	(0.145)		(0.253)	(0.230)	(0.0034)	(0.003)
$(FDI/Y)^2$	0.00018	-0.0038*		0.0023	0.0027***	0.000012	0.000022**
	(0.00013)	(0.0019)		(0.0016)	(0.00098)	(0.000011)	(0.00001))
PORT/Y			-12.972				
			(19.865)				
$(PORT/Y)^2$			6.553				
			(24.376)				
TG	-0.465***	-0.316***	-0.339***	0.862**	-0.106	-0.019***	-0.024***
	(0.107)	(0.091)	(0.116)	(0.402)	(0.322)	(0.006)	(0.006)
UNR	1.035***	0.840***	-0.489***	-0.912	0.034	-0.012	-0.0081
	(0.210)	(0.202)	(0.160)	(0.879)	(0.655)	(0.008)	(0.0085)
K/Y	0.213	0.413***	0.175**	1.919***	1.167**	0.010**	0.0051
	(0.176)	(0.152)	(0.085)	(0.557)	(0.419)	(0.004)	(0.0045)
GOVEXP	-0.243	-0.096	0.731***	0.477	0.764**	0.020**	0.028***
	(0.198)	(0.175)	(0.149)	(0.446)	(0.339)	(0.008)	(0.007)
FEMPART	-0.216	-0.603	1.428***	0.858	2.016	0.089***	0.085***
	(0.452)	(0.425)	(0.342)	(1.654)	(1.272)	(0.018)	(0.018)
OPENK	0.578	0.250	1.288**	-0.036	2.400	0.080***	0.085***
	(0.528)	(0.496)	(0.512)	(2.324)	(1.900)	(0.028)	(0.027)
OPENT	-0.180***	-0.228***	0.049*	0.044	0.180*	0.003***	0.005***
	(0.049)	(0.045)	(0.027)	(0.084)	(0.091)	(0.001)	(0.001)
Fixed effects	yes	yes	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes	yes
R-squared	0.301	0.304	0.355	0.762	0.803	0.335	0.318
No observations	360	358	381	57	54	405	388
No countries	25	24	47	26	25	48	47

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in brackets.
All regressors are one-period lagged, but columns d and e.

Table 4b: Sensitivity analysis - FDI/K

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Specification	Developed	Developed	Portfolio	4-year	4-year	Probit	Probit
Data	UNCTAD	LMF	LMF	UNCTAD	LMF	UNCTAD	LMF
FDI/K	0.011	0.038		-0.171**	-0.171***	-0.0016**	-0.0023***
	(0.010)	(0.029)		(0.067)	(0.058)	(0.00069)	(0.0006)
$(FDI/K)^2$	1.00e-06	-0.00012		0.00020	0.00011	1.17e-06*	1.35e-06**
	(5.93e-06)	(0.00007)		(0.00013)	(0.000071)	(6.45e-07)	(6.02e-07)
PORT/K			-0.0095				
			(0.0531)				
$(PORT/K)^2$			-0.00003				
			(0.00017)				
TG	-0.417***	-0.299***	-0.324***	0.820**	-0.341	-0.018***	-0.022***
	(0.101)	(0.090)	(0.115)	(0.369)	(0.317)	(0.0061)	(0.006)
UNR	0.994***	0.855***	-0.499***	-0.966	0.058	-0.010	-0.003
	(0.209)	(0.203)	(0.160)	(0.789)	(0.622)	(0.008)	(0.008)
K/Y	0.356**	0.446***	0.167**	1.374**	0.072	0.0061	-0.0008
	(0.171)	(0.153)	(0.084)	(0.504)	(0.502)	(0.0047)	(0.0049)
GOVEXP	-0.229	-0.082	0.725***	0.522	0.793**	0.194**	0.029***
	(0.194)	(0.176)	(0.150)	(0.414)	(0.329)	(0.008)	(0.007)
FEMPART	-0.320	-0.667	1.444***	0.503	2.023	0.089***	0.085***
	(0.448)	(0.426)	(0.342)	(1.560)	(1.220)	(0.018)	(0.018)
OPENK	0.694	0.313	1.334***	-0.728	2.602	0.076***	0.084***
	(0.530)	(0.494)	(0.509)	(2.284)	(1.842)	(0.028)	(0.026)
OPENT	-0.187***	-0.239***	0.044	0.029	0.166**	0.0037***	0.005***
	(0.048)	(0.045)	(0.027)	(0.078)	(0.076)	(0.0013)	(0.001)
Fixed effects	yes	yes	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes	yes
R-squared	0.298	0.298		0.795	0.818	0.344	0.33
No observations	360	358		57	54	405	388
No countries	25	24		26	25	48	47

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in brackets.
All regressors are one-period lagged, but columns d and e.

Table 6: Main studies

	LS variable	Self-employment correction	Countries	FDI variables	Openness variables	Focus	Specification
Bentolila and St-Paul (2003)		Yes	OECD				Sector level
Guscina (2006)	OECD	No	OECD	Flows Inward+Outward	OPENT	Globalization Tech change	Multivariate
Checchi and Garcia-Penalosa (2006)	OECD	No	OECD			Inequality	
Daudey and Decreuse (2006)	OECD	Yes	OECD		OPENT, OPENK	Higher education	
Decreuse and Maarek (2007)	UNIDO	Automatic	Developing	Stocks	OPENT, OPENK	Inward FDI	
Diwan (2000a)	UN	No	All		OPENK Financial crisis	Financial crises	
Diwan (2000b)	UN	Share of rural population	All		OPENT, OPENK	Globalization	
Finoff and Jayadev (2006)	UN	No	OECD		OPENT, OPENK	Feminization	
Harrison (2002)	UN	No in main regressions	All	Flows	OPENT, OPENK Financial crisis	Globalization	
IMF (2007)	OECD UNIDO	Yes	OECD	Offshoring	Immigration Terms of trade	Globalization Tech change	
Jayadev (2005)	UN	No	All		OPENK	Financial openness	
Ortega and Rodriguez (2002)	UN UNIDO	No Automatic	All		OPENT	Globalization	Probit
Ortega and Rodriguez (2006)	UNIDO	Automatic	All			Development	

Notes: Self-employment correction consists in imputing average wage to self-employed workers.
Financial crisis is a year where nominal exchange rate falls by more than 25%.

Table 7: The role of financial crises

Specification	(a)	(b)	(c)	(d)
Data	UNCTAD	LMF	UNCTAD	LMF
FDI/Y	-0.142**	-0.213***		
	(0.068)	(0.061)		
$(FDI/Y)^2$	0.00035	0.00045**		
	(0.00022)	(0.0001)		
FDI/K			-0.040***	-0.046***
			(0.013)	(0.012)
$(FDI/K)^2$			0.000026**	0.000024**
			(0.000012)	(0.000011)
TG	-0.300**	-0.378***	-0.294**	-0.330***
	(0.123)	(0.123)	(0.120)	(0.117)
UNR	-0.361**	-0.294*	-0.312*	-0.193
	(0.166)	(0.160)	(0.165)	(0.163)
K/Y	0.230**	0.084	0.118	-0.029
	(0.091)	(0.085)	(0.092)	(0.092)
GOVEXP	0.470***	0.716***	0.455***	0.740***
	(0.165)	(0.154)	(0.163)	(0.152)
FEMPART	1.714***	1.484***	1.724***	1.507***
	(0.362)	(0.343)	(0.359)	(0.340)
OPENK	1.271**	1.318**	1.240**	1.335***
	(0.561)	(0.513)	(0.555)	(0.509)
OPENT	0.072***	0.113***	0.071***	0.101***
	(0.027)	(0.029)	(0.026)	(0.027)
CRISIS	-2.088*	-2.155**	-2.138*	-2.016**
	(1.122)	(1.033)	(1.113)	(1.021)
Fixed effects	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes
R-squared	0.37	0.35	0.38	0.36
No observations	388	371	388	371
No countries	44	43	44	43

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%.
Standard errors in brackets. All regressors are one-period lagged.