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Integration and Welfare with Horizontal Multinationals*

Fabio Cerina†
Tadashi Morita‡
Kazuhiro Yamamoto§

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Abstract

We construct a two-country model with national and multinational (multiplant) firms and we investigate the effect of trade integration on welfare both at the country and at the aggregate level. When national and multinational firms coexist in equilibrium, results crucially depend on the share of industrial profits owned by a country and on the effective degree of trade integration itself. In this case, if the share of profits owned by a country is too small, then trade integration may integration on welfare is negative and positive otherwise. By contrast, when the share of profits is intermediate, the relation between trade integration and welfare is U-shaped so that, in each country, there is a welfare-minimizing degree of integration. Hence a marginal increase of the latter might be harmful (both at the country and at the aggregate level) when countries are not sufficiently well integrated while a sufficiently strong improvement in economic integration is always good both at the country and at the aggregate level. Finally, it is shown that when the distribution of global profits is uneven, liberalisation policies always increase welfare inequality.

JEL Classification: F0, O31.
Key words: trade costs, multinational firms.

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†CRENoS, University of Cagliari, E-mail address: fcerina@unica.it. Fabio Cerina has benefited of financial support from the Project "Sharing KnowledgE Assets: InteRregionally Cohesive NeigHborhoods" (SEARCH) within the 7th European Community Framework Programme FP7-SSH-2010.2.2-1 (266834) European Commission.

‡Faculty of Economics, Osaka Gakuin University, E-mail address: t-morita@ogu.ac.jp

§Graduate School of Economics, Osaka University, E-mail address: yamamoto@econ.osaka-u.ac.jp

1 Introduction

The theoretical literature on multinationals (Markusen (1984), Brainard (1993), Markusen and Venables (1998) and many others) agrees on the fact that the existence of trade costs is the main source of the emergence of horizontal multinationals i.e. firms having different plants in different countries. Actually, in Markusen and Venables words, "the decision to engage in multinationals (multi-plant) production is the tension between the added fixed cost of a second plant versus the trade cost of serving the foreign market my exporting" (Markusen and Venables 1998, p. 184).

In this paper we explore the welfare consequence of this tension. Our main objective is to analyze the link between liberalization policies and welfare (at the country and aggregate level) in presence of horizontal multinationals and asymmetries in capital shares. To this purpose, as in Behrens and Picard (2007) and Toulemonde (2008), we extend an otherwise standard international trade model by allowing monopolistically competitive firms to decide whether serving the foreign market by exporting (and then become national firms) or by opening a second plant in the foreign country (and then become multinationals). We find that, when national and multinational firms coexist in equilibrium, trade integration has ambiguous effects on welfare. The sign of this effect crucially depends, among all the parameters, on the *degree of markets integration* and on the *share of world profits* owned by each country. As for the latter, this is actually a distinguishing point of our model from the most of the existing literature [1] where the distribution of profits is usually restricted to the symmetric case. By contrast, we allow for asymmetries in the share of profits owned by each countries[2] and we find that the effect of integration on welfare differs according to whether a country is "rich" (i.e. it owns a relatively high share of profits) or "poor" (i.e. it owns a relatively low share of profits).

More precisely, it can be shown that when national and multinational firms coexist in equilibrium, integration is good for welfare only if the country is rich enough. The intuition lies on the two competing and opposite effects that integration has on profits and on the perfect price index. On the one hand, trade integration always increases profits due to a positive effect on foreign sales which is always good for industrial firm enjoying increasing returns. This positive effect on profits translates into a positive effect on real income and then on consumer welfare. On the other hand, trade integration always increase the perfect price index because it reduces the profitability and the number of multinational firms and then reduces the range of differentiated goods available to the local variety-lover consumer thereby increasing the range of imported goods which are subject to trade costs. This positive effect on the price index translates into a negative effect on real income and then on consumer welfare. As one would expect, the first (positive) effect dominates the second (negative) - and then integration is good for welfare - only when a country owns a sufficiently large share of profits i.e. when is "rich" while the opposite happens otherwise.

As for trade costs, our model extends and confirms, with a different preference structure, the result by Toulemonde (2008) according to which, under a given parameter space, the relationship between trade integration and welfare is *U-shaped*: when trade integration is sufficiently low, a further increase in the degree of trade integration reduces welfare but when the degree of trade integration is sufficiently high then integration turns out to be good for welfare. In other words, our model predicts the existence of a welfare-minimizing degree of integration. Reducing trade costs can then have completely different effect according to whether the economy is located at the left or at the right of this welfare-minimizing degree of integration. More precisely, a marginal increase of the degree of integration might be harmful (both at the country and at the aggregate level) when countries are not sufficiently well integrated while a sufficiently strong improvement in economic integration is always good both at the country and at the aggregate level.

[1] See also Baldwin et al. (2005) for an international trade model with horizontal multinationals and expaning varieties but symmetric capital ownership.

[2] Martin and Ottaviano (1999) presented a model analysing the effect of asymmetric share of capital on geography and growth.

However, opening for between countries asymmetries in capital holdings leads to some new interesting interactions between firms' ownership and trade integration. In particular, when the distribution of global profits is uneven, liberalisation policies always increase welfare inequality. Moreover, since this welfare-minimizing degree of integration is lower for "rich" countries, there is an entire range of intermediate trade costs such that liberalisation leads to opposite welfare effect in the two countries: positive in the "rich" country and negative in the "poor" one.

We believe our results to have significant policy implications. Consider for instance the policy debate on the economic and social interactions between the EU and its neighbouring countries (NCs), which has recently attracted the attention of EU policy-makers as witnessed by the European Neighbourhood Policy (ENP). According to this set of policy action plans, "through its European Neighbourhood Policy (ENP), the EU works with its southern and eastern neighbours to achieve the closest possible political association and the greatest possible degree of economic integration"[3]. Our model, however, predicts that, when multinational firms are taken into account, achieving the "greatest possible degree of economic integration" may not be a welfare-improving policy objective. More precisely, if we consider the EU countries as the set of "rich" countries and the NCs as the set of "poor" countries[4], our model suggests that any liberalisation policy will unambiguously increase welfare inequality between EU and NC and might, for some degree of economic integration, actually reduce the prosperity of NCs. For these reasons, we think that our conclusion and the economic mechanism that leads to it should not be ignored by EU policy makers.

As already anticipated, the our paper is closely related to Behrens and Picard (2007) and Toulemonde (2008). The latter obtains similar results on the U-shaped relationship of welfare and trade integration this result is obtained using a Cobb-Douglas upper-tier utility function in place of a quasi-linear specification used in this paper. Behrens and Picard (2007) constructed a monopolistic competition model with linear demand, showing that trade integration has complex effects on welfare. Their model gives a crucial role to a pro-competitive effect due to quasi-linear quadratic preferences introduced by Ottaviano et al. (2002). However, both in Behrens and Picard (2007) and Toulemonde (2008), worldwide capital stock is assumed to be equally divided among agents and no distributional issues can be analysed[5].

More generally, our work is related to the stream of literature studying the negative effect of trade integration on welfare[6]. In a similar NEG framework, with linear utilities and variable markups, Behrens et. al (2007) show that welfare effects of trade integration are ambiguous and they also find a U-shaped relationship between trade integration and welfare[7], but the mechanism they proposed is

[3]The aims of the ENP can be found at http://eeas.europa.eu/enp/. NCs include Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Moldova, Morocco, Palestine, Syria, Tunisia and Ukraine. However Algeria is currently negotiating an ENP action plan while Belarus, Libya and Syria remain outside of most of the structures of ENP

[4]As pointed out by Petrakos et al. (2013), The per capita GDP level in the EU amounts (year 2010) to $32,364 per inhabitant, whereas the corresponding level in the ENP countries amounts to (only) $4,263 per inhabitant. The GDP per capita level in the ENP countries is significantly lower even comparing to the figure ($11,891 per inhabitant) that corresponds to the new EU member-states (coming from the former Eastern bloc). Among the ENP countries, Israel is considered to be a significant outlier as it enjoys a level of economic performance ($28,506 per inhabitant) significantly higher than the corresponding level of many EU countries. We believe GDP difference is a good proxy for differences in capital holdings across the two sets of countries.

[5]Another important difference with Toulemonde (2008) is that we provide a more natural measure of welfare given by the indirect utility and this allow us to better identify the two opposing effect of economic integration on welfare.

[6]Many empirical and theoretical papers study the welfare effect of multinationals and most of them find a positive relationship, albeit for different mechanism. Alfaro and Chen (2012) for example, develops a model that incorporates two kinds of gains from multinational production: 1) knowledge spillovers from multinational to domestic firms; 2) firm selection whereby competition from multinationals leads to market reallocation and survival of only the most productive firms. Using a rich firm-level dataset they find that firm selection and market reallocation constitute an important source of productivity gains while its relative importance varies across nations. Egger et al. (2007) model predicts that intra/industry trade shares tend to rise after trade liberalisation, especially if both endowments of the two economies and investment costs for setting up multinational enterprises are not too different.

[7]The authors find that there can be excessive trade even though trade makes a wider variety of products available to consumers. Specifically, deeper integration decreases welfare when trade costs are high. By contrast it increases welfare when trade costs have fallen below a certain cost. Additionally, the range of trade costs for which trade liberalization raises welfare depends on the internal geography and the quality of transportation infrastructure of the trading partner.

different from ours and their model gives no role to (horizontal) multinationals. A similar ambiguous effect is found, albeit in a very different framework, by Peretto (2003) which, by adding firm-level increasing returns to the Rivera-Batiz and Romer (1991) model of endogenous growth and international trade, finds that integration might reduce growth and welfare because firms may face lower incentive to innovate by taking into account that some of the knowledge that they accumulate spills over their competitors.

The paper is structured as follows. Section 2 describes the model, section 3 investigates the equilibrium properties, section 4 runs the welfare analysis and section 5 concludes.

2 The model

Our model can be considered as a variant of the footloose capital model introduced by Martin and Rogers (1995).

2.1 Demand side

The economy is made of two symmetric countries, 1 and 2, with equal working population L, equal technology and preferences[8]. Labor can be used to produce homogeneous agricultural goods and differentiated manufactured goods. While labor can be mobile between sectors in the same country, it is immobile between different countries.

The representative consumer in country i ($i = 1, 2$) is assumed to have quasilinear utility function (Pfugler 2004) which is positively affected by A_i (the consumption of agricultural goods in country i) and M_i (the consumption of the composite of manufactured goods in country i):

$$U_i = A_i + \mu \ln M_i, \;\; \mu > 0, \tag{1}$$

where

$$M_i = \left[\int_0^{n^w} m_i(j)^{\frac{\sigma-1}{\sigma}} dj \right]^{\frac{\sigma}{\sigma-1}}, \; \sigma > 1.$$

and $m_i(j)$ denotes the consumption of manufactured variety j in country i. As in every footloose capital model, there is a strict connection between the world number of varieties and the global stock of capital. To produce a variety, x units of capital are needed. The stock of capital available worldwide is given by K^w , so that $n^w = xK^w$. Moreover, as we assume that the world stock of capital is fixed, we can normalize $xK^w = n^w = 1$ so that $x = 1/K^w$. Finally, unlike Toulemonde (2008), we don't restrict our analysis to the case in which capital ownership is uniformly distributed among the $2L$ individuals but allow capital ownership and revenues to differ across individual so that each individual of country i owns s_i/L units of capital (or profits) where s_i is the share of capital (or profits) owned by residents in country i and it is not necessarily equal to 1/2.

First and second-level optimization lead to the following demand functions (taking the homogeneous good as the numeraire):

$$M_i = \frac{\mu}{P_i}, \tag{2}$$

$$P_i = \left(\int_0^1 p_i(j)^{1-\sigma} dj \right)^{\frac{1}{1-\sigma}},$$

$$Y_i = E_i - \mu, \tag{3}$$

$$m_i(j) = \frac{\mu P_i^{\sigma-1}}{p_i(j)^{\sigma}}, \tag{4}$$

[8] Assuming asymmetric population would not change results significantly.

where P_i is the 'perfect price index' of country i. $p_i(j)$ is the consumer price of variety j in country i, and E_i represents the expenditure of a consumer in country i. Notice that, thanks to quasilinear upper-tier utility, the demand for each single variety is not affected by expenditure E_i.

Substituting (2) and (3) into (1) we can obtain the following indirect utility function:

$$U_i = E_i - \mu \ln P_i - \mu(1 - \ln \mu). \tag{5}$$

2.2 Production

2.2.1 Agricultural sector

The production structure of the agricultural sector is standard: the representative agricultural firm operates in a perfectly competitive market and produces under constant returns to scale using 1 unit of labor to produce one unit of A in both countries. Hence, the production function in country i is $A_i = L_{iA}$ where $L_{iA} < L_i$ is the amount of labour force devoted to the traditional sector in country i. We assume that the agricultural good is freely traded so that the equilibrium wages in the two countries become $w_1 = w_2 = 1$ [9]

2.2.2 Manufacturing sector: national and multinational firms

In the manufactured goods sector, manufacturing firms operate under Dixit-Stiglitz (1977) type monopolistic competition such that each variety is produced by only one firm. Each firm has two different options: 1) becoming a national firm which has only one plant in country i or; 2) becoming a multinational firm which has plants in both countries (multiplant).

To become national firm in country i, the manufacturing firm has to incur, on top of the costs of capital, in a fixed cost equivalent to F units of labor while, to become multinational, each firm has to hire $\frac{F^M}{2}$ units of labor in both countries as fixed costs. We assume that $F^M > F$ so that firm-level fixed costs are higher for multinational firms. Moreover, national firms located in country i and multinational firms use 1 units of labor in its country as marginal input to produce one unit of manufactured variety. Hereafter, superscripts $(1, 2, M)$ represent a variable as referring to national firms in country 1, 2, and multinational firms respectively. Under this production structure, the profits of national firms in country i (before capital costs)[10] is the following:

$$\pi^i(j) = p_i^i(j)q_i^i(j) + p_{i'}^i(j)q_{i'}^i(j) - (q_i^i(j) + \tau q_{i'}^i(j)) - F,\ i, i^{'} = 1, 2, i \neq i^{'}, \tag{6}$$

where $p_{i'}^i(j)$ denotes the price of variety j sold in country $i^{'}$ and produced by a national firms in country i and $q_{i'}^i(j)$ denotes the quantity of variety j sold in country $i^{'}$ and produced by a national firms in country i. We assume international shipping of a manufactured variety is costly as it implies an "iceberg" cost: if a national firm sends 1 units of goods to a foreign country, it must dispatch τ units of goods where $\tau > 1$.

The equilibrium in each variety market of country i implies that demand and supply of each variety j should be equal in both countries:

$$q_i^i(j) = L_i m_i(j). \tag{7}$$

Profit maximization together with (4) and (7) leads to the following constant markup prices:

$$p_i^i(j) = \frac{\sigma}{\sigma - 1}, \tag{8}$$

$$p_{i'}^i(j) = \tau p_i^i(j) = \tau \frac{\sigma}{\sigma - 1}.$$

[9] If $E_1 - \mu + E_2 - \mu \geq L$, agricultural goods are produced in both countries at the equilibrium. In our model, $E_i \geq wL = L$. Then, assuming $L > 2\mu$ ensures that agricultural goods are produced in two countries at the equilibrium.

[10] Since capital costs are the same across countries and across types of firms, we don't need to explicitly model them. In any case they will be canceled out after the equilibrium condition according to which profits should be equal across countries and types of firms. From now on, when we write "profits", we mean "profits before the cost of capital".

Hence, substituting back in (6), profits of national firms in country i are given by

$$\pi^i = \frac{\mu}{\sigma - 1}\left(\frac{\sigma}{\sigma - 1}\right)^{-\sigma}\left[\frac{L_i}{P_i^{1-\sigma}} + \frac{\phi L_{i'}}{P_{i'}^{1-\sigma}}\right] - F,\ i, i' = 1, 2, i \neq i', \tag{9}$$

where $\phi \equiv \tau^{-(\sigma-1)}$ represents the so-called freeness of trade which is such that $\phi \in (0,1)$ being $\phi = 0$ in case of prohibitive trade costs (autarky) $\phi = 1$ when integration is perfect. ϕ is then an inverse function of trade costs and represents our measure of the degree of trade integration or trade liberalisation[11].

Finally, notice that since countries are assumed to be perfectly symmetric, the spatial distribution of firms is symmetric too and therefore $n_1 = n_2 \equiv n$. As a consequence, $P_1 = P_2 \equiv P$ and also $\pi^1 = \pi^2 \equiv \pi$ so that profits for national firms can be written as

$$\pi = \frac{\mu}{\sigma - 1}\left(\frac{\sigma}{\sigma - 1}\right)^{-\sigma}\frac{L(1+\phi)}{P^{1-\sigma}} - F. \tag{10}$$

2.2.3 Multinational firms

We now turn to focus on the behavior of multinational firms. Their profits can be written as:

$$\pi^M(k) = p_1^M(k)q_1^M(k) + p_2^M(k)q_2^M(k) - (q_1^M(k) + q_2^M(k)) - F^M, \tag{11}$$

where $p_1^M(k)$ and $q_1^M(k)$ denotes the price and quantity of a variety k produced sold in country 1 and produced by multinational firms whereas $p_1^M(k)$ and $q_1^M(k)$ denotes the price and volume of sales in country 2 produced by multinational firms. It is important to notice that since multinationals have plants in both countries, they do not incur the trade costs. Using (4) and (7) and from profit maximization, we obtain:

$$p_1^M = p_2^M = \frac{\sigma}{\sigma - 1}. \tag{12}$$

Then, substituting back in (11), profits of multinational firms are given by

$$\pi^M = \frac{\mu}{\sigma - 1}\left(\frac{\sigma}{\sigma - 1}\right)^{-\sigma}\frac{2L}{P^{1-\sigma}} - F^M. \tag{13}$$

Finally, to close the model, we need a labor market clearing condition. If n^M is the number of multinational firms then we have $n^1 + n^2 + n^M = 2n + n^M = 1$. Hence the labor market equilibrium condition in country i can be written as follows:

$$L_i = L_{iA} + 2\int_0^n \left(q_i^i(j) + \tau q_{i'}^i(j)\right) dj + \int_0^{n_M} q_i^M(k)dk + nF + n_M\frac{F^M}{2}, i = 1\ or\ 2.$$

3 Equilibrium

In the following section we characterize the properties of the equilibrium. We focus, in particular, on the set of equilibria where both national and multinational firms coexist in both country. In this case we have $n > 0$ and $n_M > 0$ so that, using (8) and (12), the perfect price indexes of both countries can be expressed as:

$$\begin{aligned} P &= \left[\int_0^n \left(\frac{\sigma}{\sigma-1}\right)^{1-\sigma} dj + \int_n^{2n}\left(\frac{\tau\sigma}{\sigma-1}\right)^{1-\sigma} dk + \int_{2n}^1 \left(\frac{\sigma}{\sigma-1}\right)^{1-\sigma} dk'\right]^{\frac{1}{1-\sigma}} \\ &= \frac{\sigma}{\sigma-1}\left[1 - (1-\phi)n\right]^{\frac{1}{1-\sigma}}. \end{aligned} \tag{14}$$

[11]These two terms will be interchangeable in our paper.

Moreover, as already said, since we focus on the equilibrium where $n > 0$, and $n_M > 0$, the following equation must be satisfied:

$$\pi = \pi^M.$$

Then, using (6) and (13), we can obtain the following equation:

$$\frac{\mu(1-\phi)}{\sigma-1}\left(\frac{\sigma}{\sigma-1}\right)^{-\sigma}\frac{L}{P^{1-\sigma}} = F^M - F.$$

Substituting the price index epression (14) into the above equation yields

$$\frac{L}{1-(1-\phi)n} = \frac{\sigma(F^M-F)}{\mu(1-\phi)}.$$

That can be solved with respect to n, in order to obtain the *equilibrium number of national firms in each country*:

$$n = \frac{1}{1-\phi} - \frac{\mu L}{\sigma f}, \tag{15}$$

where $f = F^M - F > 0$ represents the difference of fixed costs between national firms and multinational firms. Notice that, in order to have a strictly positive number of national firms in equilibrium, we should have

$$n > 0 \Leftrightarrow \phi > \frac{\mu L - \sigma f}{\mu L} \equiv \phi_1. \tag{16}$$

So that only when $\phi > \phi_1$, i.e. trade costs are low enough, the number national firms is positive in equilibrium in each country. Moreover

$$\frac{\partial n}{\partial \phi} = \frac{1}{(1-\phi)^2} > 0, \tag{17}$$

so that the number of national firms is increasing in the degree of integration as they become more profitable than multinationals. And, also,

$$\frac{\partial n}{\partial f} = \frac{\mu L}{\sigma f^2} > 0,$$

so that, clearly enough, national firms become more profitable when the fixed costs of multinational firm becomes relatively larger.

As for multinational firms, since the total number of the firms is unity, the number of the multinational firms is given by $n_M = 1 - 2n$ which yields

$$n_M = \frac{2\mu L}{\sigma f} - \frac{1+\phi}{1-\phi}. \tag{18}$$

Clearly enough, here the relationship between number of multinationals and trade integration goes on the opposite direction: the number of multinationals is positive if and only if trade costs are high enough,

$$n_M > 0 \Leftrightarrow \phi < \frac{2\mu L - \sigma f}{2\mu L + \sigma f} \equiv \phi_2,$$

and, moreover,

$$\frac{\partial n_M}{\partial \phi} = -\frac{2}{(1-\phi)^2} < 0, \tag{19}$$

so that the number of multinational firms is decreasing with the degree of integration. This should not surprise as it formalizes the idea according to which the incentive to engage in multi-plant production by serving the foreign market with local production, is stronger when trade costs are relatively low.

Finally, and quite intuitively,

$$\frac{\partial n_M}{\partial f} = -\frac{2\mu L}{\sigma f^2} < 0.$$

It is also important to notice that, for any values of the parameters we have

$$\phi_1 < \phi_2$$

so that the degree of integration above which we have a positive number of national firms is lower than the degree of integration below which we have a positive number of multinational firms. This means that national and multinational firms can coexist in equilibrium only when $\phi \in (\phi_1, \phi_2)$.

This analysis shows that the relative importance of national and multinational firms is highly affected by the degree of economic integration. According to the parameters' value we can have different outcomes which are resumed in the following proposition (proof is straightforward from elementary computations)

Proposition 1 *1. When $f > \frac{2\mu L}{\sigma}$ holds, $\phi_1 < \phi_2 < 0$ and then $n = \frac{1}{2}$ and $n_M = 0$.*

2. Suppose that $\frac{\mu L}{\sigma} < f < \frac{2\mu L}{\sigma}$. Hence $\phi_1 < 0 < \phi_2$ and national firms exist for any ϕ.

- *(a) When $\phi \in (0, \phi_2)$ then $n_M > 0$ and $n > 0$*
- *(b) When $\phi \in [\phi_2, 1)$ then $n_M = 0$ and $n = \frac{1}{2}$*

3. Suppose that $f < \frac{\mu L}{\sigma} < \frac{2\mu L}{\sigma}$ hence $0 < \phi_1 < \phi_2$

- *(a) When $\phi \in (0, \phi_1]$ then $n = 0$ and $n_M = 1$.*
- *(b) When $\phi \in (\phi_1, \phi_2)$ then $n > 0$ and $n_M > 0$.*
- *(c) When $\phi \in [\phi_2, 1)$ $n = \frac{1}{2}$ and $n_M = 0$.*

As we can see, the difference in the fixed costs between national and multinational firms has a preminent role in determining which of the three regimes will operate. In regime 1, multinationals fixed costs is relatively too large for any value of trade costs and therefore only national firms will operate in equilibrium. In regime 2, when the difference in fixed costs is intermediate, national firms will operate for any value of trade costs while multinationals will exists only if trade costs are low enough. Finally in regime 3, when the difference in fixed costs is relatively low, then national firms don't exist when trade costs are too high while multinationals don't exists when trade costs are too low. And they both coexists when trade costs are intermediate. To sum-up, n and n_M are simultaneously positive, when ϕ is such that $\phi_1 < \phi < \phi_2 < 1$, regardless of whether ϕ_1 is positive (regime 3) or negative (regime 2).

3.1 The effects of integration on prices

The way the degree of trade integration ϕ affects prices P differs according to whether, in equilibrium, national and multinational firms coexist or not. As it is clear from proposition 1, only the third regime, which applies when $f < \frac{\mu L}{\sigma}$, includes all the three feasible allocations of national and multinational firms (one in which $n_M = 0$ and $n = \frac{1}{2}$, one in which $n > 0$ and $n_M > 0$ and one in which $n = 0$ and $n_M = 1$). This is the case we will focus on for the rest of the analysis. Using (14) and since $1 - n = n + n_M$, price index can be generally written as

$$P = \frac{\sigma}{\sigma - 1}\left[\underbrace{n_M + n}_{\text{Purchases on domestic plants}} + \underbrace{\phi n}_{\text{Purchases on foreign plants}}\right)\Bigg]^{\frac{1}{1-\sigma}}.$$

Differentiating the last equation with respect to ϕ we find

$$\frac{\partial P}{\partial \phi} = -\frac{P}{(\sigma - 1)\left[n + n_M + n\phi\right]}\left(\underbrace{\frac{\partial (n + n_M)}{\partial \phi}}_{\text{Effect on domestic purchases}} + \underbrace{\phi\frac{\partial n}{\partial \phi} + n}_{\text{Effect on foreign purchases}}\right)$$

This expression is important as it sheds light on the possibly counterintuitive effect of integration on the price index and then on welfare. The total effect of trade integration on prices is the result of two different effect: the one on domestic purchases - i.e. the way ϕ affect the number of local plants $n_M + n$ - and the one on foreign purchases, which are affected by trade integration both directly and indirectly through the number of goods produced in the foreign country. We already know - from (17) - that n is negatively affected by ϕ while the opposite happens to n_M as shown by (19). But then what happens to the number of local plants? The sign of its derivative with respect to ϕ is ambiguous at first sight so it needs to be studied. Since $1 - n = n + n_M$ and using (15), we can write

$$n + n_M = \frac{\mu L}{\sigma f} - \frac{\phi}{1-\phi}. \tag{20}$$

Differentiating n and n_M with respect to ϕ and f we obtain the following expressions

$$\begin{aligned} \frac{\partial (n+n_M)}{\partial \phi} &= -\frac{1}{(1-\phi)^2} < 0, \\ \frac{\partial (n+n_M)}{\partial f} &= -\frac{\mu L}{\sigma f^2} < 0, \end{aligned}$$

which prove the following proposition

Proposition 2 *1. A decrease in trade costs reduces the number of local plants in both countries*

2. A decrease in the difference of fixed costs between multinational and national firms reduce the number of local plants in both countries

This proposition has a clear interpretation: since the both derivatives $\frac{\partial(n+n_M)}{\partial\phi}$ and $\frac{\partial(n+n_M)}{\partial f}$ have the same sign of $\frac{\partial n_M}{\partial \phi}$ and $\frac{\partial n_M}{\partial f}$ and opposite sign with respect to $\frac{\partial n}{\partial \phi}$ and $\frac{\partial n}{\partial f}$, that means that in both cases the effects on multinational firms dominate the effects on national firms[12]. Hence, *when national and multinational firms coexist in equilibrium*, local plants decrease (increase) when trade costs decreases (increases) and when the additional fixed costs of multinationals increases (decreases).

However, we also know from proposition 1 that (when $f < \frac{\mu L}{\sigma}$) national and multinational firms may or may not coexist according to the effective value of ϕ. In particular, they don't coexist for extreme value of trade costs. More precisely, using (15) and (20) we can write

$$\begin{aligned} \forall \phi &\in (0, \phi_1], [(n=0) \vee (n_M = 1)] \Rightarrow P = \frac{\sigma}{\sigma-1} \\ \forall \phi &\in (\phi_1, \phi_2), [(n>0) \vee (n_M > 0)] \Rightarrow P = \frac{\sigma}{\sigma-1}\left[(1-\phi)\frac{\mu L}{\sigma f}\right]^{\frac{1}{1-\sigma}} \\ \forall \phi &\in [\phi_2, 1), \left[\left(n = \frac{1}{2}\right) \vee (n_M = 0)\right] \Rightarrow P = \frac{\sigma}{\sigma-1}\left(\frac{1+\phi}{2}\right)^{\frac{1}{1-\sigma}} \end{aligned} \tag{21}$$

By differentiating with respect to ϕ for ϕ belonging to each interval, we find

$$\begin{aligned} \forall \phi &\in (0, \phi_1], \frac{\partial P}{\partial \phi} = 0 \\ \forall \phi &\in (\phi_1, \phi_2), \frac{\partial P}{\partial \phi} = \frac{P}{(\sigma-1)(1-\phi)} > 0 \\ \forall \phi &\in [\phi_2, 1), \frac{\partial P}{\partial \phi} = -\frac{P}{(\sigma-1)(1+\phi)} < 0 \end{aligned}$$

This analysis proves the following proposition

[12]This is a robust feature of the Dixit-Stiglitz framework.

Proposition 3 *For very high trade costs, $\phi \in (0, \phi_1]$, price indexes of both countries are unaffected by the degree of economic integration. For intermediate trade costs, $\phi \in (\phi_1, \phi_2)$, an increase in the degree of economic integration leads to an increase in the perfect price indexes of both countries. For very low trade costs, $\phi \in [\phi_2, 1)$, an increase in the degree of economic integration leads to a decrease in the perfect price indexes of both countries.*

Such a non-linear relationship between trade costs and prices can be explained as follows. In the first case, when trade costs are too high for national firms to be profitable, prices do not depend on trade costs because there's actually no trade between regions as local consumers are served only by local plants of multinational firms. In the third case, trade costs are too low for multinational firms to be profitable and then, as in the standard footloose capital model with no multinationals, prices are negatively affected by trade costs as the only effect of the latter is to make foreign goods more expensive for the variety-lover consumer. The previous results are quite standard.

On the other hand, the relationship between trade costs and prices in the intermediate case might look counteintuitive at first sight. But it is actually easy to interpret. In this case, when national and multinational firms coexist in equilibrium, the effect of trade integration on the perfect price index is twofold: 1) it reduces the price index as imports are cheaper (effect on foreign purchases) 2) it increases the price index as local consumption decreases in favor of foreign imports which are more expensive due to trade costs (effect on domestic purchases). It turns out that the reduction in the consumption of local goods due to trade integration - which causes a reduction of local plants from proposition 2 - is so strong that it always offsets the positive effect of integration on "effective" prices and therefore economic integration has always a *negative* net effect on the perfect price index. In other words, when trade costs decreases there is a reduction in the number of multinational firms which leads to a reduction in local plants and then in the range of local varieties produced and consumed. Alternatively, we may think that local consumers prefer to spend the additional real income (induced by a decrease in the cost of foreign goods) to buy more foreign varieties (then increasing the extent of expenditure subject to trade costs) than spending it in local goods. It turns out that this indirect effect on the price index (increase in foreign purchases) always offsets the direct effect (reduction in the price of foreign varieties) so that, eventually, an increase in the degree of market integration leads to an increase in the perfect price index.[13]

As for the effect of the difference in the fixed costs f on the price index, we have

$$\begin{aligned}
\phi &\in (0, \phi_1] \Rightarrow \frac{\partial P}{\partial f} = 0 \\
\phi &\in (\phi_1, \phi_2) \Rightarrow \frac{\partial P}{\partial f} = \frac{\sigma}{(\sigma-1)^2}\left[\frac{\mu L}{\sigma f}(1-\phi)\right]^{\frac{1}{1-\sigma}-1}\frac{\mu L}{\sigma f^2}(1-\phi) > 0 \\
\phi &\in [\phi_2, 1) \Rightarrow \frac{\partial P}{\partial f} = 0
\end{aligned}$$

which shows the following proposition

Proposition 4 *For very high ($\phi \in (0, \phi_1]$) and very low ($\phi \in [\phi_2, 1)$) trade costs, price indexes of both countries are unaffected by differenced between multinational and national firms fixed costs. For intermediate trade costs ($\phi \in (\phi_1, \phi_2)$), an increase in the difference between multinational and national firms fixed costs leads to an increase in the perfect price indexes in both countries.*

The intuition is again quite similar. When national and multinational firms do not coexist, there is no reason why price indexes should be affected by relative difference in fixed costs. However, when national and multinational firms coexists, an increase in f reduces the profitability of multinational firms and, from, proposition 2, even the number of local plants. As a consequence, variety lover-consumers perceive an higher general price. Notice that the positive effect of f on the perfect price index is the same even if due to a *decrease* in the fixed costs of national firms.

[13] Again, this is a robust feature of the Dixit-Stiglitz framework.

4 Welfare, inequality and integration

In the following section we analyse the effect of economic integration on consumer welfare. A measure of the latter is given by the indirect utility function expressed in (5). While the symmetric locational equilibrium of firms ensures that the price index is the same for each country ($P_1 = P_2 = P$), expenditure may well differ across countries because the latter is affected by profits whose distribution may not be symmetric as we allow, unlike Behrens and Picard (2007) and Toulemonde (2008), capital distribution not to be symmetric across agents. More precisely, we allow separation between firm's location and firm's ownership so that, a firm may be located in country i but its profits may be owned by a consumer in country j and there may be repatriated and spent[14]. In this case per capita expenditure in country i is given by

$$E_i = w_i + \frac{s_i \pi}{L},$$

where w_i is the wage rate in country i, $s_i = 1 - s_j \in (0,1)$ is the share of capital owned by country i so that $\frac{s_i \pi}{L}$ are *per-capita* profits owned by an individual in country i. Since $w_i = 1$, the welfare function of country i can be written as

$$U_i = 1 + \frac{s_i \pi}{L} - \mu \ln P - \mu(1 - \ln \mu). \tag{22}$$

As we can see, welfare is affected by profits (positively) and by the perfect price index (negatively). Both profits and prices are in turn affected by the degree of integration ϕ but, clearly enough, the way ϕ affects π and P differs according to whether, in equilibrium, national and multinational firms coexist or not. While the analysis of the way ϕ (and also f) affects prices has been developed in the previous section, we now focus on profits. Substituting the respective values of the price indexes expressed in (21) in both (10) and (13) and equalizing the latters when $\phi \in (\phi_1, \phi_2)$, we obtain the following expressions for profits

$$\begin{aligned}
\forall\phi &\in (0,\phi_1], \left[\pi_M = \frac{2\mu L}{\sigma} - F_M\right] \wedge \left[\frac{\partial \pi_M}{\partial \phi} = 0\right] \\
\forall\phi &\in (\phi_1,\phi_2), \left[\pi = \pi_M = \frac{F^M(1+\phi) - 2F\phi}{1-\phi}\right] \wedge \left[\frac{\partial \pi}{\partial \phi} = \frac{\partial \pi_M}{\partial \phi} = \frac{2f}{(1-\phi)^2} > 0\right] \\
\forall\phi &\in [\phi_2,1), \left[\pi = \frac{2\mu L}{\sigma} - F\right] \wedge \left[\frac{\partial \pi}{\partial \phi} = 0\right]
\end{aligned} \tag{23}$$

Notice that profits are affected by trade integration only for intermediate trade costs, when the no-arbitrage condition between national and multinational profits applies. When trade costs are very high, and no national firms exist, profits of multinational firms do not depend on ϕ. Analogously, when trade costs are very low, and no multinational firms exist, freeness of trade does not affect national firms' profits[15]. By contrast, for intermediate trade costs, profits are positively affected by trade integration because in this case the positive effect on foreign sales is not offset by the effect on prices which (according to proposition 2) in this case is positive as well.

If we substitute for (21) and (23) in (22) and consider all the three cases, we obtain three expressions in which welfare which is function of exogenous parameters only

$$\begin{aligned}
\forall\phi &\in (0,\phi_1], U_i = 1 + s_i\left(\frac{2\mu}{\sigma} - \frac{F_M}{L}\right) - \mu(1 + \ln\frac{\sigma}{\mu(\sigma-1)}) \\
\forall\phi &\in (\phi_1,\phi_2), U_i = 1 + s_i\frac{F^M(1+\phi) - 2F\phi}{(1-\phi)L} + \ln(1-\phi)^{\frac{\mu}{\sigma-1}} - \mu\left(1 - \ln\frac{(\sigma-1)(\mu^\sigma L)^{\frac{1}{\sigma-1}}}{(\sigma^\sigma f)^{\frac{1}{\sigma-1}}}\right) \\
\forall\phi &\in [\phi_2,1), U_i = 1 + s_i\left(\frac{2\mu}{\sigma} - \frac{F}{L}\right) + \ln(1+\phi)^{\frac{\mu}{\sigma-1}} - \mu\left(1 - \ln\frac{\mu(\sigma-1)}{2^{\frac{1}{\sigma-1}}\sigma}\right)
\end{aligned} \tag{24}$$

[14]It is important to notice that changes in the distribution of profits, and then on the distribution of expenditure, have no consequences on firm's location. This happens because, with quasi linear upper-tier preferences, the demand function of each single variety is not affected by market size and then by national expenditure.

[15]It is important to highlight that, being $F < F_M$, profits are lower when trade costs are very high ($\phi \in (0, \phi_1)$) than when they are very low ($\phi \in (\phi_2, 1)$).

We can then differencitate these expressions with respect to ϕ in order to finally evaluate the welfare effect of integration for each level of $\phi \in (0,1)$

$$\begin{array}{lll}
\forall\phi & \in & (0,\phi_1], \dfrac{\partial U_i}{\partial \phi} = \left[\underbrace{0}_{\text{profits effect}} + \underbrace{0}_{\text{price effect}}\right] = 0 \\
\forall\phi & \in & (\phi_1,\phi_2)\,, \dfrac{\partial U_i}{\partial \phi} = \left[\underbrace{\dfrac{s_i}{L}\dfrac{2f}{(1-\phi)^2}}_{\text{profits effect}} - \underbrace{\dfrac{\mu}{(\sigma-1)(1-\phi)}}_{\text{price effect}}\right] \lesseqgtr 0 \\
\forall\phi & \in & [\phi_2,1), \dfrac{\partial U_i}{\partial \phi} = \left[\underbrace{0}_{\text{profits effect}} + \underbrace{\dfrac{\mu}{(\sigma-1)(1+\phi)}}_{\text{price effect}}\right] > 0
\end{array} \tag{25}$$

Expression (25) is the core of the main contribution of our paper. As we can see the impact of trade integration on welfare changes quite radically according to the three different cases but, in general, it can be decomposed in two competing and opposite effects: 1) an effect on profits; 2) an effect on the perfect price index.

When trade costs are sufficiently high, both effect are null, resulting in a null effect of trade integration on welfare. This conclusion is easily explained by the fact that in this case, only multinational firms exist and they serve both local markets by producing locally and they need not shipping the goods. Therefore, trade costs have no role in the analysis.

By contrast, when trade costs are sufficiently low, the profits effect is null while the price effect is positive. In this case, only national firm exist and since they serve foreign market by shipping goods which are subject to trade costs, variety-lover consumers are better off with more trade integration because foreign goods become less expensive.

Finally, when trade costs fall within a intermediate range, the sign of the impact of trade integration on welfare is ambiguous as it depends on the particular values of the parameters involved. In this case, we have a positive effect on profits and a negative effect on prices because - as stated in proposition 3 - the loss due to the increase of the range of goods subject to trade costs more than offset the gain due to the lower price of foreign goods. The net effect on welfare depends on which of the two effect will prevail. Notice that both the price and the profit effect are increasing (in absolute value) in the degree of trade integration ϕ but the profits effect increases faster so that lower trade costs increase the probability of a positive welfare effect of integration. More precisely, for $\phi \in (\phi_1, \phi_2)$ we have

$$\frac{\partial U_i}{\partial \phi} \geq (<)\, 0 \Leftrightarrow \phi \geq (<)\, \hat{\phi}\left(s_i, \mu, L, f, \sigma\right) = 1 - s_i \frac{2f\left(\sigma - 1\right)}{\mu L},$$

which highlights the possibility of a U-shaped relationship between trade integration and welfare. However, such U-shaped relationship is not a general outcome as the cutoff level $\hat{\phi}\left(s_i, \mu, L, f, \sigma\right)$ might not belong to the feasible interval (ϕ_1, ϕ_2) to which this regime applies. We then have to distinguish between three cases according to different values of the country's share of profits

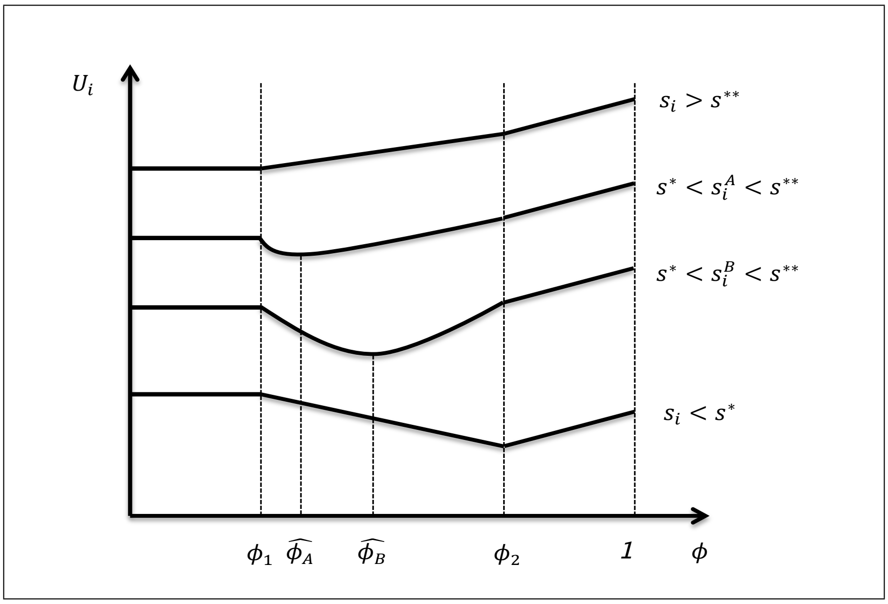
$$\begin{array}{lll}
\hat{\phi}\left(s_i,\mu,L,f,\sigma\right) & \leq & \phi_1 \Leftrightarrow s_i \geq s^{**} \Rightarrow \dfrac{\partial U_i}{\partial \phi} > 0, \forall \in (\phi_1,\phi_2) \\
\hat{\phi}\left(s_i,\mu,L,f,\sigma\right) & \in & (\phi_1,\phi_2) \Leftrightarrow s^* < s_i < s^{**} \Rightarrow \dfrac{\partial U_i}{\partial \phi} \geq (<)\, 0 \Leftrightarrow \phi \geq (<)\, \hat{\phi}\left(s_i,\mu,L,f,\sigma\right) \\
\hat{\phi}\left(s_i,\mu,L,f,\sigma\right) & \geq & \phi_2 \Leftrightarrow s_i \leq s^* \Rightarrow \dfrac{\partial U_i}{\partial \phi} < 0, \forall \in (\phi_1,\phi_2)\,.
\end{array}$$

Where $s^{**} = \frac{1}{2}\frac{\sigma}{\sigma-1}$ and $s^* = \frac{\mu L}{2\mu L - \sigma f}\frac{\sigma}{\sigma-1}$. We can then state the following proposition

Proposition 5 *When $\phi \in (\phi_1, \phi_2)$, the shape of the relationship between trade integration and welfare, crucially depends on the country's share of world profits s_i. When a country is relatively poor, $s_i \le s^* = \frac{\mu L}{2\mu L - \sigma f} \frac{\sigma}{\sigma - 1}$, trade integration unambiguosly reduces welfare, $\frac{\partial U_i}{\partial \phi} < 0$. When a country is relatively rich, $s_i \ge s^{**} = \frac{1}{2} \frac{\sigma}{\sigma - 1}$, trade integration unambiguosly increases welfare, $\frac{\partial U_i}{\partial \phi} > 0$. When a country's share in world's profit is intermediate, $s^* < s_i < s^{**}$, the relationship between trade integration and welfare is U-shaped being decreasing when trade costs are high enough, $\phi < \hat{\phi} = 1 - s_i \frac{2f(\sigma-1)}{\mu L}$, and increasing when trade costs are low enough, $\phi > \hat{\phi} = 1 - s_i \frac{2f(\sigma-1)}{\mu L}$.*

This proposition, which is represented graphically in fig. 1 below. In this figure, we have drawn four different curves representing the integration-welfare relationship for four different values of the country's share in global profits.

Figure 1: Welfare and trade integration with different values of country's share in global profits



This results deserve some comments. First of all, it is important to highlight the role of country's wealth in the relationship between trade integration and welfare. On the one hand, unsurprisingly, country's welfare is increasing in country's share in global profits. On the other hand, country's share in global profits also affects the shape of the relationship between trade integration and welfare. More precisely, when a country is poor enough, $s_i \le s^*$, the positive effect of trade integration on income (via its positive effect on profits) cannot be too large and therefore, it can never offset the negative effect on prices. The opposite happens when a country is rich enough, $s_i \ge s^{**}$. In this case, the representative consumer owns a sufficient share of global profits to take advantage from integration as the positive effect on income from profits more than compensate the negative effect on the price index.

But the most interesting case appears to be the one with intermediate level of wealth which is the case we focus on for the rest of the section. In this case, the integration-welfare relationship is U-shaped with the cutoff level $\hat{\phi}(s_i, \mu, L, f, \sigma) = 1 - s_i \frac{2f(\sigma-1)}{\mu L}$ being higher the poorer the country . Then $\hat{\phi}(s_i, \mu, L, f, \sigma)$ is the degree of integration that minimizes the welfare level of country i. In other words, for low level of trade integration, the (negative) price effect of integration on welfare dominates the (positive) profits effect, while the opposite happens for high leve of trade integration. Therefore, it is clear that implementing policies aiming at reducing trade costs can have completely different effects according to whether the economy is located at the left or at the right of this welfare-minimizing degree of integration. In the first case, a reduction in trade costs is detrimental to welfare, while it is welfare-improving in the latter.

A corollary of this conclusion is that, since $\frac{\partial \hat{\phi}}{\partial s_i}$ is clearly negative, this welfare-minimizing degree of integration is lower for the "rich" country:

$$s_i \geq (<)\, s_j \Rightarrow \hat{\phi}\,(s_i, \mu, L, f, \sigma) \leq (>)\, \hat{\phi}\,(s_j, \mu, L, f, \sigma)\,. \tag{26}$$

Hence when the distribution of profits among countries is uneven ($s_i \neq \frac{1}{2}$), then integration policies have important distributional consequences. As shown by fig.1, there is an entire range of trade costs values such that a further reduction in trade costs will increase welfare in the rich country and decrease it in the poor one. More precisely, as in figure 1 $s_A < s_B$, then $\hat{\phi}\,(s_A, \mu, L, f, \sigma) > \hat{\phi}\,(s_B, \mu, L, f, \sigma)$ and for any $\phi \in \left[\hat{\phi}\,(s_B, \mu, L, f, \sigma)\,, \hat{\phi}\,(s_A, \mu, L, f, \sigma)\right]$ a pro-liberalisation policy will reduce welfare in country A (the poorest, call it the "East") and increase welfare in country B (the richest, call it the "West").

It is important to highlight that this results also applies to the case when s_i doesn't belong to the interval (s^*, s^{**}). More precisely, from (25) and (26) it is straightforward to conclude that, when $s_1 > \frac{1}{2}$,

$$\frac{\partial U_1}{\partial \phi} > 0 \text{ and } \frac{\partial U_2}{\partial \phi} < 0 \text{ for any } \phi \in \left(\max\left[\hat{\phi}\,(s_1, \mu, L, f, \sigma)\,, \phi_1\right], \min\left[\hat{\phi}\,(s_2, \mu, L, f, \sigma)\,, \phi_2\right]\right). \tag{27}$$

so that for intermediate values of the degree of integration a further liberalisation policy will make the richest country better off and the poorest country worse off.

Another related result which applies to the case $\phi \in (\phi_1, \phi_2)$ is that, even when integration is good for the poor country, (i.e. $\phi > \min\left[\hat{\phi}\,(s_j, \mu, L, f, \sigma)\,, \phi_2\right]$), a greater degree of trade integration will always increase welfare inequality (measured as differences in welfare levels) between rich and poor. To see this, imagine $s_1 > \frac{1}{2}$ so that country 1 is relatively richer than country 2 and consider the difference in the welfare of the two country

$$U_1 - U_2 = (2s_1 - 1)\,\frac{F^M(1+\phi) - 2F\phi}{(1-\phi)\,L} > 0, \text{ for } \phi \in (\phi_1, \phi_2) \tag{28}$$

We can then compute the effect of trade integration on welfare distribution which is

$$\frac{\partial\,(U_1 - U_2)}{\partial \phi} = \frac{2s_1 - 1}{L}\,\frac{2f}{(1-\phi)} > 0, \text{for } \phi \in (\phi_1, \phi_2)$$

which proves the following proposition

Proposition 6 *When the distribution of global profits is uneven, trade liberalisation always increases welfare inequality.*

It is important to emphasize that welfare inequality increases even if welfare of country 2 (the poorest) increases as - in any case - $\frac{\partial U_1}{\partial \phi} > \frac{\partial U_2}{\partial \phi}$ when $s_1 > \frac{1}{2}$.

Finally, and from a wider perspective, it is worth noticing that the cut-off value $\hat{\phi}\,(s_i, \mu, L, f, \sigma)$ is function of all the main parameters of the model. More precisely, straighforward computations easily show that the value of $\hat{\phi}_i$ is affected by the parameters of the model according to the following table.

	s_i	μ	L	σ	f
$\hat{\phi}$	$-$	$+$	$+$	$-$	$-$

4.1 Global welfare, distribution and integration

Proposition 5 tells us that, when multinational and national firms exist in equilibrium (i.e. for intermediate trade costs, $\phi \in (\phi_1, \phi_2)$) the welfare impact of trade liberalisation in a country is crucially affected by its share of global profits. Then a natural question arises: is there any optimal distribution of profits share such that a certain global welfare function is maximized? Of course this question may have different answer according to different functional forms of the welfare function and different weights associated to each countries. The most neutral approach to be adopted seems to be the utilitarian one, under which global welfare would be expressed as

$$U^w = \frac{U_1 + U_2}{2},$$

or

$$U^w = 1 + \frac{1}{2}\frac{F^M(1+\phi) - 2F\phi}{(1-\phi)L} + \frac{\mu}{\sigma-1}\ln(1-\phi) - \mu\left(1 - \ln\frac{(\sigma-1)(\mu^\sigma L)^{\frac{1}{\sigma-1}}}{(\sigma^\sigma f)^{\frac{1}{\sigma-1}}}\right), \phi \in (\phi_1, \phi_2)$$

which - as we can see - doesn't depend on the countries' shares of global profits as each country's welfare is linear in s_i. As a consequence, under a pure utilitarian perspective, *global welfare is not affected by the distribution of profits.*

Hence

$$\frac{\partial U^w}{\partial \phi} > 0 \Leftrightarrow \phi > \hat{\phi}^w(\mu, L, f, \sigma) = 1 - \frac{f(\sigma-1)}{\mu L},$$

where

$$s_i < (>)\,\frac{1}{2} \Leftrightarrow \hat{\phi}^w(\mu, L, f, \sigma) < (>)\,\hat{\phi}(s_i, \mu, L, f, \sigma),$$

so that the welfare-minimizing degree of integration at the aggregate level is lower than the one at the country level if and only if the country is relatively poor.

5 Conclusions and Policy recommendation

We have presented an international trade model with horizontal multinationals and quasi-linear upper-tier utility. Our main focus was on the link between liberalisation and welfare. While in standard models of international trade with monopolistic competition liberalisation - by increasing foreign sales and purchasing power - is unambiguously good for welfare, the introduction of horizontal multinationals may radically change this figure. Economic integration reduces the relative profitability of multinationals as serving the foreign market by exporting becomes less expensive. Hence economic integration leads to a reduction in the number of multinationals which in turn reduces the range of product differentiation in local goods leading to a welfare reduction for variety-lover consumers. It turns out that this negative effect (due to an increase in the foreign purchases subject to trade costs) is larger than the positive effect (due to larger sales and higher purchasing power) either when the country is "poor" (i.e. it owns a sufficiently low share of world profits) and/or when the two countries are not well integrated. As far as trade costs are concerned, our paper predicts the existence of a U-shaped relationship between economic integration and welfare both at the national and at the aggregate level. This U-shaped relationship, confirms the findings of Behrens et al. (2007) (obtained with a different mechanism) and testifies the existence of a welfare-minimizing degree of integration which, in our model, is lower for "rich" countries. As a consequence, an increase in the degree of trade liberalization 1) is more likely to damage poor than rich countries and; 2) always increase welfare inequality.

Our findings have relevant policy implications for any policy action aiming at increasing the market access across different areas and, at the same time, promoting a socially sustainable development. In particular, as pointed our any ENP policy would be better designed if the economic mechanism highlighted by our model would be taken into account. As a matter of fact, if the mechanism we highlighted is strong enough in actual economies, then policy makers should be aware of the fact that one of main aims of the European Neighbouring Policy ("achieving the greatest degree of economic integration") might be incompatible with economic and social cohesion between EU and Neighbouring countries.

Despite our model is highly stylized, we think it highlights a mechanism which may be relevant in actual economies as it reveals that liberalisation policies may have counterintuitive effects when horizontal multinationals are involved. A natural extension of our model would be that of introducing the possibility of growth in the number of firms and then testing the relevance of the mechanism proposed under a dynamic context. We leave this topic for future research.

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