MODELING FDI:
TARIFF JUMPING AND EXPORT PLATFORMS

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Abstract

We develop a pair of industry-specific partial equilibrium models of trade policy that estimate how changes in tariff rates affect FDI. The models focus on two different types of FDI. Tariff-jumping FDI is likely to expand with a large increase in the tariff rate in export markets, while export platform FDI is likely to contract with a large increase in the tariff rate on returning imports of offshored production. We run a series of simulations to demonstrate how the models work.

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1 Introduction

Different types of foreign direct investment (FDI) serve different purposes. For example, tariff-jumping FDI occurs when a firm establishes local production through direct investment in a foreign market in order to jump a tariff on cross-border exports into the market. Export platform FDI occurs when a domestic producer invests in offshore production in a foreign country and then exports its product back to its domestic market (or to third-country markets).[1]

Both of these types of FDI can be affected by changes in tariff rates, though in opposite directions. A large increase in the tariff rate on exports to a foreign market makes tariff-jumping FDI more likely. On the other hand, a large increase in the tariff rate on returning imports of offshored production makes export platform FDI less likely. Whether a rise in tariffs will increase or decrease FDI depends on the purpose of FDI and the magnitude of the tariff change.

Even after determining the purpose of the FDI, it can be challenging to construct economic models that predict changes in foreign investments in response to changes in trade policy, because market entry often involves fixed costs that introduce discontinuities in firms' decision making. Firms can tip from an equilibrium where FDI is the most profitable mode of supply to a different equilibrium with exporting, or they can tip back in the other direction. Small changes in tariff rates can sometimes have large effects on FDI, while large changes in tariff rates can sometimes leave FDI unchanged.

The contribution of this paper is to develop industry-specific partial equilibrium models that can be used to predict the impact of changes in tariff rates on FDI despite these modeling challenges. The models include differentiated products with CES demands, constant

[1] There are several other types of FDI in Markusen (2002) that are not addressed in this paper, including vertical FDI, FDI to transfer technology, and FDI to concentrate ownership and increase market power. The first of these is addressed in Barbe and Riker (2017), and the second and third are addressed in Riker (2019) and Riker and Schreiber (2019).

marginal costs, and Bertrand oligopoly. This market structure fits the highly concentrated industries that account for most FDI. The first application of the model focuses on tariff-jumping FDI, while the second application focuses on export platform FDI. We run a series of simulations to demonstrate how the models work.

2 Tariff-Jumping FDI

Tariff-jumping FDI occurs when a firm invests in local affiliate production in a foreign market to jump a tariff on cross-border exports into the market. Our model resembles the horizontal FDI framework in Helpman, Melitz and Yeaple (2004); however, we are modeling the FDI decisions of individual firms in partial equilibrium rather than industry-level trade and investment outcomes in general equilibrium, so we adopt an oligopoly market structure instead of monopolistic competition.[2] Following Markusen (2002), the firms are globally competitive because they own knowledge capital assets, which may include a unique product or process technology or other intangibles like global brand recognition or a reputation for quality. The firms can supply a foreign market through FDI in local affiliate production, at relatively low variable cost (because the affiliate sales are not subject to the tariff) but relatively high fixed costs. Alternatively, the firms can supply the foreign market through cross-border exports, at relatively high variable costs (because the exports are subject to the tariff) but relatively low fixed costs.

2.1 Costs, Demand and Competition

Equilibrium prices are determined in a Bertrand duopoly pricing game with CES demands and FDI that is similar to the model in Riker (2019).[3] Each firm considers whether it is more

[2] The monopolistic competition market structure in Helpman et al. (2004) assumes that there is a continuum of firms that vary in their productivity according to a Pareto distribution.

[3] However, one important difference is that Riker (2019) treats FDI decisions as exogenous.

profitable to supply a foreign market through FDI in local affiliate production or through cross-border exports. Like in Helpman et al. (2004), each firm faces a fixed cost of FDI and local affiliate production (f) and an ad valorem tariff on cross-border trade (τ). The firm simultaneously chooses its mode of supply (FDI or export) and price in the foreign market taking the mode of supply and price of its competitor as given. The price elasticity of total industry demand in the market is $\epsilon < 0$. The elasticity of substitution between the products of the firms is $\sigma > 1$ and the demand asymmetry parameter on the product of the second firm is $b > 0$.

2.2 Model Calibration

In the initial equilibrium, firm 1 supplies the market through FDI in local affiliate production, and firm 2 supplies the market through cross-border exports. Equation (1) calibrates the demand asymmetry parameter b using the elasticity of substitution σ, observed initial equilibrium prices p_1 and p_2, expenditure values v_{X2} and v_{A1}, and initial tariff rate τ.

$$\frac{v_{X2}}{v_{A1}} = b \left(\frac{p_2 \ (1+\tau)}{p_1} \right)^{1-\sigma} \tag{1}$$

Equations (2) and (3) represent the firms' variable profits when the tariff rate is τ.

$$\pi_{A1}(\tau) = (p_1 - c_1) \ k \ \left(p_1^{1-\sigma} + b \ (p_2 \ (1+\tau))^{1-\sigma} \right)^{\frac{\sigma+\epsilon}{1-\sigma}} \ p_1^{-\sigma} \tag{2}$$

$$\pi_{X2}(\tau) = (p_2 - c_2) \ k \ \left(p_1^{1-\sigma} + b \ (p_2 \ (1+\tau))^{1-\sigma} \right)^{\frac{\sigma+\epsilon}{1-\sigma}} \ (p_2 \ (1+\tau))^{-\sigma} \ b \tag{3}$$

The corresponding first order conditions, $\frac{\partial \pi_{A1}(\tau)}{\partial p_1} = 0$ and $\frac{\partial \pi_{X2}(\tau)}{\partial p_2} = 0$, determine the Nash equilibrium prices p_1 and p_2. We use these two first order conditions and the initial equilibrium prices to calibrate the marginal costs of the two firms, c_1 and c_2.

Assuming that local affiliate production has relatively low variable cost and relatively high fixed cost, the model will fit an industry in which the firm that supplies the market through FDI has a larger share of the foreign market than the firm that supplies the foreign market by exporting (v_{A1} is greater than v_{X2}). In this case, the firm that supplies the market through FDI achieves sufficient scale to cover the higher fixed cost of local affiliate production in the initial equilibrium.

Next, we define the variable profits a firm would earn if it deviated from this initial Nash equilibrium while its competitor did not. We calculate the prices and profits from the unilateral deviations in order to impute the magnitude of the fixed cost f. Equation (4) is the variable profits of firm 1 if it deviates from the initial equilibrium but firm 2 does not. The deviation profit levels and prices are indicated by an asterisk.

$$\pi^*_{X1}(\tau) = (p^*_1 - \frac{c_1}{\omega})\ k\ \left((p^*_1\ (1+\tau))^{1-\sigma} + b\ (p_2\ (1+\tau))^{1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ (p^*_1\ (1+\tau))^{-\sigma} \tag{4}$$

ω is the ratio of wages for local production in the foreign market to wages for domestic production for export, assuming that each firm has the same unit labor requirement in the two countries. Equation (5) is the variable profits of firm 2 if it deviates from the equilibrium but firm 1 does not.

$$\pi^*_{A2}(\tau) = (p^*_2 - c_2\ \omega)\ \ k\ \left(p_1^{1-\sigma} + b\ p_2^{*1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ (p^*_2)^{-\sigma}\ b \tag{5}$$

The corresponding first order conditions, $\frac{\partial\pi^*_{A2}(\tau)}{\partial p^*_2} = 0$ and $\frac{\partial\pi^*_{X1}(\tau)}{\partial p^*_1} = 0$, define the deviation prices p^*_1 and p^*_2.

We combine (2) through (5) to calibrate the following upper and lower bounds on the fixed cost of FDI, assuming that f is the same for the two firms:

$$\pi^*_{A2}(\tau) - \pi_{X2}(\tau) < f < \pi_{A1}(\tau) - \pi^*_{X1}(\tau) \tag{6}$$

We can infer that f falls in the range in (6), though we cannot determine the value of f more precisely based on the information available from the initial equilibrium.

2.3 Is there a new equilibrium with additional FDI?

Next, we use the model to simulate prices and profits after τ increases to τ'. We are interested in whether there is a new equilibrium with additional FDI and local production after the tariff increase.[4] Equations (7) and (8) are the variable profit functions for a new equilibrium with both firms supplying the foreign market through FDI and local production.

$$\pi_{A1}(\tau') = (p_1 - c_1)\ k\ \left(p_1^{1-\sigma} + b\ p_2^{1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ p_1^{-\sigma} \tag{7}$$

$$\pi_{A2}(\tau') = (p_2 - c_2\ \omega)\ k\ \left(p_1^{1-\sigma} + b\ p_2^{1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ p_2^{-\sigma}\ b \tag{8}$$

Equation (9) is the variable profits of firm 1 if it deviates from this equilibrium while firm 2 does not.

$$\pi^*_{X1}(\tau') = \left(p_1^* - \frac{c_1}{\omega}\right)\ k\ \left((p_1^*\ (1+\tau'))^{1-\sigma} + b\ p_2^{1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ (p_1^*\ (1+\tau'))^{-\sigma} \tag{9}$$

Equation (10) is the variable profits of firm 2 if it deviates from the equilibrium while firm 1 does not.

[4] In some cases there is also an equilibrium in which firm 2 supplies the market through local affiliate production while firm 1 exports, the reverse of the assumed initial equilibrium in which firm 1 supplies the market through local affiliate production while firm 2 exports. There would be a change in FDI if the firms switched between these two equilibria, even without any change in the tariff rate. The model is not trying to address this possibility. Instead, it is establishing the tariff increase necessary for the existence of the new equilibrium with both firms supplying the foreign market through FDI, without addressing the uniqueness of this equilibrium.

$$\pi^*_{X2}(\tau') = (p^*_2 - c_2)\ k\ \left(p_1^{1-\sigma} + b\ (p^*_2\ (1+\tau'))^{1-\sigma}\right)^{\frac{\sigma+\epsilon}{1-\sigma}}\ (p^*_2\ (1+\tau'))^{-\sigma}\ b \tag{10}$$

The two first order conditions in the equilibrium ($\frac{\partial \pi_{A1}(\tau')}{\partial p_1} = 0$ and $\frac{\partial \pi_{A2}(\tau')}{\partial p_2} = 0$) and in the deviations ($\frac{\partial \pi^*_{X1}(\tau')}{\partial p^*_1} = 0$ and $\frac{\partial \pi^*_{X2}(\tau')}{\partial p^*_2} = 0$) determine the new equilibrium prices (p_1 and p_2) and the deviation prices (p^*_1 and p^*_2).

There is a new equilibrium with both firms supplying the foreign market through FDI if $\pi_{Aj}(\tau') - \pi^*_{Xj}(\tau') > f$ for $j \in \{1, 2\}$. We cannot evaluate these inequalities directly unless we observe f; however, we can conclude that there is a new equilibrium if (11) holds for $j \in \{1, 2\}$ and all of the elements of this second set of inequalities are directly observable.

$$\pi_{Aj}(\tau') - \pi^*_{Xj}(\tau') > \pi_{A1}(\tau) - \pi^*_{X1}(\tau) \tag{11}$$

In general, this second set of inequalities will be satisfied if the tariff increase $\tau' - \tau$ is large enough. If the tariff change is not large enough to satisfy this second set of inequalities, it might still satisfy the first set of inequalities and the new equilibrium might still exist, but the analysis is inconclusive based on the information available from the initial equilibrium. We do not know where f falls within the range calibrated in (6). The second set of inequalities is sufficient but not necessary for the new equilibrium with additional FDI.

Finally, we can ask whether the status quo is still an equilibrium after the increase in the tariff. This would be the case if:

$$\pi^*_{A2}(\tau') - \pi_{X2}(\tau') < f \tag{12}$$

The answer is that we do not know if the status quo will remain an equilibrium based on the information available from the initial equilibrium. As long as $\tau' > \tau$, $\pi^*_{A2}(\tau') - \pi_{X2}(\tau') > \pi^*_{A2}(\tau) - \pi_{X2}(\tau)$ according to the structural model. The tariff increase raises the relative profitability of tariff-jumping FDI, but it is not clear whether it will raise it enough that the condition for the status quo equilibrium in (12) will no longer hold. We know that the initial relative profitability of firm 2 is below f, but we do not know whether it is slightly below or far below. On the other hand, if the tariff increases enough that $\pi_{A2}(\tau') - \pi^*_{X2}(\tau') > \pi_{A1}(\tau) - \pi^*_{X1}(\tau)$ then we can conclude that the status quo is not an equilibrium after the tariff increase, because we know that $\pi_{A1}(\tau) - \pi^*_{X1}(\tau) > f$ from the initial equilibrium.

2.4 Tariff Jumping Model Simulations

In this section, we run several simulations to illustrate how the tariff-jumping FDI model works. First, we show how different sizes of tariff increases change the decision to invest in local production in a foreign market. Second, we adjust ω, the relative wage, to understand how lower wage costs impact the decision to invest. Finally, we vary the elasticity of substitution parameter and show how the extent of product differentiation across varieties affects the model.

Table 1: Simulation Results under Different Tariff Increases

	Small Tariff Increase	Large Tariff Increase
Elasticity of substitution σ	5	5
Relative wages ω	1.0	1.0
Price elasticity of demand ϵ	-1	-1
Firm 1 market share	70%	70%
Firm 2 market share	30%	30%
Tariff change	5% to 10%	5% to 20%
Does firm 2 change to FDI?	Inconclusive	Yes
Firm 1 producer price (% change)	N/A	-2.33%
Firm 2 producer price (% change)	N/A	0.62%
Firm 2 consumer price (% change)	N/A	-4.17%
Firm 1 quantity (% change)	N/A	0.02%
Firm 2 quantity (% change)	N/A	9.99%

In the first column of Table 1, we increase the tariff rate from 5% to 10%. In the second column, we model a larger tariff increase by changing the tariff rate from 5% to 20%. We use an elasticity of substitution σ value of 5 and a price elasticity of total industry demand ϵ value of -1. The initial market share of firm 1, the firm that initially invests in local production through FDI, is 70% and firm 2, the firm that supplies the foreign market through cross-border exports, is 30%. As described in Section 2.2, the initial FDI firm must have a larger market share to achieve sufficient scale to cover higher fixed costs of local affiliate production. We set the relative wage parameter ω to 1, so that marginal labor costs do not change when the firm changes their supply strategy.

When the tariff increase is small, the model is inconclusive about the decision of firm 2 to continue to export or switch to FDI. This is because the new variable profits do not cross the upper bound threshold, and the model does not have enough information about fixed costs to predict an outcome. In the second simulation in Table 1, the tariff change is large enough for firm 2 to cross the profitability threshold and begin supplying the market through FDI in local production instead of exports. Firm 2 is no longer subject to the 5% initial tariff, so we see an increase in the producer price and a decrease in consumer price as variable costs are lowered with the removal of the tariff. With the lower relative price, demand for firm 2 products increases and variable profits increase. Demand for firm 1 products decreases as they are now relatively more expensive.

Table 2: Simulation Results under Varying Relative Wages

	No Change in Wages	Small Change in Wages	Large Change in Wages
Elasticity of substitution σ	5	5	5
Ratio foreign to domestic wages ω	1.0	0.9	0.8
Price elasticity of demand ϵ	-1	-1	-1
Firm 1 market share	70%	70%	70%
Firm 2 market share	30%	30%	30%
Tariff change	5% to 40%	5% to 40%	5% to 40%
Does firm 2 change to FDI?	Yes	Yes	Inconclusive
Firm 1 producer price (% change)	-2.33%	-6.90%	N/A
Firm 2 producer price (% change)	0.62%	-8.03%	N/A
Firm 2 consumer price (% change)	-4.17%	-12.41%	N/A
Firm 1 quantity (% change)	0.02%	-0.83%	N/A
Firm 2 quantity (% change)	9.99%	34.59%	N/A

In Table 2, we present model results under different ω inputs. The ω parameter changes the marginal costs of the firm when switching from exporting to FDI. If ω is less than one in the Tariff Jumping model, foreign wages are lower than domestic wages where firm 2 initially produces. We model a 5% to 40% tariff increase, and fix the elasticity of substitution σ at 5, price elasticity of industry demand ϵ at -1, and market shares of firm 1 and firm 2 as 70% and 30% respectively. Comparing columns 1 and 2, we see a more magnified response in firm 2 when their variable wage costs lower as a result of switching to FDI. Because of the lower wage costs, firm 2 lowers the price of their product and captures more market share after switching to FDI. Firm 1 must also lower the price of their product to compete with the lower prices offered by firm 2. The ω parameter has two effects: the effect on first order conditions as described above, and the effect on the fixed costs bounds. In the third simulation in Table 2, the low ω value increases the upper bound on fixed costs sufficiently high, leading to an inconclusive model result.

In Table 3, we vary the elasticity of substitution σ parameter. We model an increase in the tariff rate from 5% to 15%, the initial market share of firm 1 is 70% and the initial market share of firm 2 is 30%. We use a price elasticity of total industry demand value of -1 and relative wage ω value of 1.0.

The substitution elasticity in the first column in Table 3 is 2, representing products that have low substitutability or are highly differentiated. The substitution elasticity in column 2 is 8, indicative of products that are highly substitutable. Firm 2 switches from exporting to FDI in both simulations, but different σ values change the magnitude of response in prices and quantities. A low elasticity value leads to lower producer prices for both firm 1 and 2 because consumers are less likely to switch among alternatives after the tariff change. In the simulation with a high substitution elasticity, consumers are more likely to switch products when the relative price goes up, leading to a more magnified response.

Table 3: Simulation Results under Different Substitution Elasticities

	Low Substitutability	High Substitutability
Elasticity of substitution σ	2	8
Relative wages ω	1.0	1.0
Price elasticity of demand ϵ	-1	-1
Firm 1 market share	70%	70%
Firm 2 market share	30%	30%
Tariff change	5% to 15%	5% to 15%
Does firm 2 change from exporting to FDI?	Yes	Yes
Firm 1 producer price	-1.51%	-2.52%
Firm 2 producer price	0.51%	0.64%
Firm 2 consumer price	-4.28%	-4.15%
Firm 1 quantity	0.66%	-1.14%
Firm 2 quantity	6.56%	13.17%

3 Export Platform FDI

Export platform FDI occurs when a domestic producer invests in offshore production and then exports the product back to the domestic market (or to third-country markets). Our model of export platform FDI is different from the classic offshoring model in Grossman and Rossi-Hansberg (2008), because the firms are relocating the entire production process rather than part of a continuum of production tasks and there are fixed costs of offshoring, but the economic issues are still similar. The firms in our model of export platform FDI can supply the domestic market from domestic production, at relatively high variable cost (assuming relatively high domestic wages) but relatively low fixed costs. Alternatively, they can supply the domestic market from offshore production, at relatively low variable costs (despite the tariff) but relatively high fixed costs.

3.1 Structural Model

The model in Section 2 can be reapplied in the export platform case, with subscript A re-interpreted as local production to supply the domestic market and subscript X re-interpreted as offshore production to supply the domestic market through cross-border exports. The question for the model of export platform FDI is whether there is a new equilibrium with re-shoring (a location of offshore production to the domestic economy) and less FDI when the tariff increases. If we observe that there is an initial equilibrium that includes offshore production despite the initial tariff in place, it is likely that offshore wages are much lower than domestic wages, so ω will be greater than one in the export platform application of the model from Section 2. Since the model assumes that offshore production has relatively low variable cost and relatively high fixed costs in the initial equilibrium, it fits an industry in which the firm that supplies the market through export platform FDI and offshore production has a larger market share then the firm with domestic production (v_{X2} is greater than v_{A1}). In this case, the firm with offshore production achieves sufficient scale to cover its higher fixed costs in the initial equilibrium.

3.2 Export Platform Model Simulations

In this section, we run several simulations to illustrate how the export platform version of the model works. First, we show how the magnitude of the tariff increase impacts model results in Table 4, and then we show impacts of the relative wage parameter ω in Table 5. Column 1 of Table 4 shows a tariff increase from 5% to 10% and column 2 shows a tariff increase from 5% to 20%. In column 3, we increase the substitution elasticity to 10 to model varieties that are nearly perfect substitutes. The initial market share of firm 1, the firm that initially supplies the market through local production, is 30% and firm 2, the firm that initially supplies the market through offshore production, is 70%. The price elasticity of total industry demand ϵ is -1 and the relative wage parameter ω is fixed at 1.0 in Table 4 simulations.

Comparing the first two simulations in Table 4, the size of the tariff change does not affect the magnitude of prices and quantities once firm 2 crosses the profitability threshold

Table 4: Simulation Results with Different Tariff Changes

	Small Tariff Change	Large Tariff Change	High σ
Elasticity of substitution σ	5	5	10
Relative wages ω	1.0	1.0	1.0
Price elasticity of demand ϵ	-1	-1	-1
Firm 1 market share	30%	30%	30%
Firm 2 market share	70%	70%	70%
Tariff change	5% to 10%	5% to 20%	5% to 20%
Does firm 2 re-shore production?	Yes	Yes	Yes
Firm 1 producer price (% change)	-0.57%	-0.57%	-0.54%
Firm 2 producer price (% change)	2.47%	2.47%	2.83%
Firm 2 consumer price (% change)	-2.41%	-2.41%	-2.06%
Firm 1 quantity (% change)	-4.61%	-4.61%	-9.00%
Firm 2 quantity (% change)	4.73%	4.73%	6.26%

to re-shore. After switching to re-shoring, firm 2 is no longer subject to a tariff increase so the magnitude of τ' no longer impacts results. Results do change, however, when we change the substitution elasticity from 5 to 10. For varieties that are more substitutable, we see a larger change in the firm 2 producer price and a larger change in quantity sold as consumers purchase more firm 2 product.

In Table 5, we vary the relative wage parameter ω, representing the ratio of the domestic wage to the foreign offshored wage. A value greater than 1 means that firm 2 will pay a much higher domestic wage after re-shoring than the offshored wage they paid in the initial equilibrium. For example, an ω value of 1.5 means the domestic wage is 50% higher than the offshored wage. The results show that the higher the relative (domestic) wage, the larger the price impacts. Firm 2 must raise their price sufficiently high to cover the higher labor costs after re-shoring. Demand for firm 1 product increases as the relative price of Firm 2 increases, and firm 1 captures more market share.

Table 5: Simulation Results under Varying Relative Wages

	No Change in Wage	Small Change in Wage	Large Change in Wage
Elasticity of substitution σ	5	5	5
Relative wages ω	1.0	1.2	1.5
Price elasticity of demand ϵ	-1	-1	-1
Firm 1 market share	30%	30%	30%
Firm 2 market share	70%	70%	70%
Tariff change	5% to 25%	5% to 25%	5% to 25%
Does firm 2 re-shore production?	Yes	Yes	Yes
Firm 1 producer price (% change)	-0.57%	1.85%	6.22%
Firm 2 producer price (% change)	2.47%	12.74%	28.97%
Firm 2 consumer price (% change)	-2.41%	7.37%	22.83%
Firm 1 quantity (% change)	-4.61%	13.26%	36.14%
Firm 2 quantity (% change)	4.73%	-12.99%	-34.15%

4 Conclusions

The two models focus on how tariff changes affect different types of FDI. Tariff-jumping FDI is likely to expand with an increase in tariff rates in export markets, while export platform FDI is likely to contract with an increase in tariff rates on imports of offshore production.

An important limitation of our modeling approach is that it requires observing at least one firm active on each side of the relative profitability threshold before the change in tariff rates. However, this limitation is not unique to our approach: it is true for any econometric analysis that relies on variation in outcomes.[5]

A second limitation of our modeling approach is that we are estimating a bound on fixed costs rather than an exact amount. This seems inevitable with a small number of firms in the industry. If there were a large number of firms, approaching a continuum, then the least productive firm that crossed the threshold would exactly identify the fixed cost. However, in reality most industries with significant FDI consist of a small number of large firms, not a continuum of small firms.

One extension of the model is to assume a specific probability distribution for the fixed

[5]For example, there is a large econometric literature on fixed costs and firm-level discussions to export that followed Clerides, Lack and Tybout (1998), Bernard and Jensen (1999), and Aw, Chung and Roberts (2000).

costs within the range defined in (6). With this assumption, the model can calculate the likelihood that the new equilibrium with a change in FDI exists, rather than just evaluating the sufficiency condition in (11). The model could also be extended to consider a multi-period time horizon for the present discounted returns to investment and to consider the impact of policy, demand, and production cost uncertainty on the FDI decisions.

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