The Impact of Tax and Transfer Pricing on a Multinational Firm’s Strategic Decision of Selling to a Rival

Abstract: We consider an integrated multinational firm (MNF) who produces a product in a low-tax country and sells it in a high-tax country. The global firm faces the decision of whether to sell the product (and at what price) to an external rival in the retail market who has an alternative outside sourcing option. Using a Cournot competition model, we show that two salient elements of the global tax planning—namely the tax rate disparity and the regulatory restrictions on transfer pricing between the MNF’s low-tax and high-tax divisions—have significant impacts on the MNF’s decision of selling to the rival. We find that when the tax rate disparity is low, the MNF will sell, but only to a low-cost rival, a result that is in-line with the traditional understanding in a tax-free setting. However, when the tax rate disparity is high, the outcome of selling or not reverses: the MNF will sell only to a high-cost rival. We also find that under the requirement of minimum order quantity, the MNF may sell to the rival at a price even higher than the latter’s alternative sourcing cost. Another interesting finding of our analysis is that the regulatory restriction on transfer pricing may bring benefit rather than burden to the global firm.

Key words: selling to rival; global operations; international taxation; arm’s length principle
1 Introduction

Offshoring—whereby a multinational firm (MNF) sets up manufacturing subsidiaries in foreign countries to supply inputs (e.g., components or final products) to their retailing subsidiaries in the home country—has become an increasingly popular global supply chain practice for its ability to (among other things) lower labor costs (Markides and Berg 1988, Morris 2015) and offer tax saving opportunities (Hsu and Zhu 2011, Shunko et al. 2014). An important issue to consider is whether or not MNFs should allow their overseas manufacturing subsidiaries to supply inputs to rival firms who may eventually compete with their retailing subsidiaries in downstream retail markets.

On the one hand, selling inputs to rivals opens more viable income streams for an MNF’s manufacturing subsidiaries. Such upstream income can be significant especially when the rival has already taken a large market share in the downstream retail market, and thus requires large quantities of inputs from the MNF. For example, Samsung’s device solutions business, which sells components to competitors such as Apple, accounts for around 63% of the company’s profit (Samsung Geeks 2015). On the other hand, selling to rivals may cause tension between an MNF’s manufacturing and retailing subsidiaries, because the former’s supply of essential inputs to the latter’s existing or potentially new competitors will inevitably make the downstream retail market more competitive and thus may hurt the latter’s profits (Bloomberg et al. 2001). Such a concern is especially pronounced when the rival’s alternative options to get the essential inputs are either much more costly or nonexistent. Therefore, to protect the interests of its downstream retailing subsidiaries, an MNF may intentionally raise its rival’s costs by increasing the price for inputs or even completely denying the rival’s access to its supply of inputs (Ordover et al. 1990).

The literature has examined the above tradeoff under various supply chain settings and obtained useful results regarding these types of strategic selling-to-rival decisions. Arya et al. (2008) show that an integrated firm is better off selling to a rival who is relatively competitive with a sufficiently efficient retail operation or the downstream competition is sufficiently heterogenous. Chen et al. (2008) show that an integrated firm with a direct selling channel
is better off selling to a more competitive rival with a sufficiently low inconvenience cost for customers. Wang et al. (2013) consider a setting in which an integrated firm sells its product to a rival who has an alternative sourcing option. They assume that the integrated firm makes centralized manufacturing and retailing quantity decisions and therefore will always sell to the rival at a wholesale price lower than the latter’s alternative sourcing cost.

However, none of the above-mentioned papers have considered how the MNF’s strategic selling-to-rival decisions might be influenced by the global tax system, when the MNF’s manufacturing and retailing subsidiaries reside in tax jurisdictions with different tax rates. The importance of aligning international tax planning with global operations strategies has been well recognized by MNFs (Murphy and Goodman 1998, Oster 2009). In particular, many MNF’s manufacturing subsidiary typically faces a lower tax rate than that of the retailing subsidiary. These firms will be motivated to shift taxable income from high-tax jurisdictions to low-tax jurisdictions by strategically setting their internal transfer prices (De Simone 2016). They would therefore favor the pre-tax profits earned upstream more than downstream, suggesting that everything else being equal, the tax consideration should make selling-to-rival more attractive. However, the impact of tax consideration on the selling-to-rival decision is more subtle. In particular, the arm’s length principle (ALP) complicates the effect taxes have on the selling-to-rival decision. Under ALP, the MNF is required to set the internal transfer price to be consistent with the price at which the MNF sells the same or similar inputs to outside unrelated parties (OECD 2010). Hence, if the MNF decides to sell the inputs to the rival, the selling price to the rival naturally establishes a benchmark for the MNF’s internal transfer price, thereby imposing a restriction on the MNF’s ability to minimize its tax liability by charging a higher transfer price from the low-tax manufacturing subsidiary to high-tax retailing subsidiary. From this perspective, the tax consideration should make selling-to-rival less attractive.

This paper uses a game-theoretical approach to gain a more complete view of how the global tax consideration would impact the MNF’s strategic selling-to-rival decision. We consider a decentralized MNF consisting of a manufacturing subsidiary residing in a low-tax country selling inputs to its retailing subsidiary in a high-tax country. The MNF aims to
maximize its total after-tax profits by deciding whether or not to sell inputs to a rival and if so at what price. Under the selling-to-rival scenario, the MNF is required by ALP to use a *market-based* transfer price which equals to the external selling price. By contrast, under the not-selling-to-rival scenario, we assume that the MNF can resort to *non-market-based* approaches to justify setting its internal transfer price within a range of allowable arm’s length prices (Baldenius et al. 2004). After the selling and pricing decisions are made, the MNF’s retailing subsidiary and the rival engage in Cournot competition, each making quantity decisions to maximize its own profits.

In the following, we provide a few real examples to which the above modeling framework is applicable. P&G’s Duracell battery factory in China manufactures for its own brand Duracell and another brand Kirkland owned by Costco (UPI 1994, Verdi 2014, Howard 2016). Bumble Bee’s Puerto Rico plant supplies albacore tuna for its own brand and also for Kirkland brand (Gertner 2003, Seaman 2014). From our conversation with a manager at the P&G’s China subsidiary which manufactures the batteries, we learned that the external transactions with Kirkland indeed impose constraints on P&G’s internal transfer price decisions due to the transfer price regulations. Therefore, it is practically important to study the MNF’s selling-to-rival decision with the global tax consideration.

Our study demonstrates that international tax considerations will significantly impact an MNF’s global supply chain decisions. Specifically, we find that under the regulatory ALP restrictions, the magnitude of the tax (rate) disparity (the difference between the tax rates in the two high-tax and low-tax countries) which represents the marginal benefit for income shifting, can fundamentally influence the MNF’s strategic selling-to-rival decision. Specifically, when the two tax rates are equal, the MNF is better off selling to a relatively more competitive rival whose alternative sourcing cost is below a particular threshold. As the tax disparity increases, this threshold increases, implying that the MNF should sell to a wider range of rivals. When the tax disparity reaches a range of moderate values, the MNF should always sell to the rival regardless of its alternative sourcing cost. However, when the tax disparity grows further, the earlier result that the MNF should sell only to a relatively stronger rivals with low alternative sourcing cost is reversed: the MNF in this case...
will sell to a relatively weaker rival with a sufficiently high alternative sourcing cost. Another interesting finding of our analysis is that the regulatory restriction on transfer pricing may increase rather than decrease the MNF’s global after-tax profits.

Previous literature about selling to rival mainly trade off the upstream wholesale profit gains with the downstream retailing profit loss resulting from the decision of selling to a downstream rival. The results in Arya et al. (2008) and Chen et al. (2008) suggest that that the integrated firm should exclude those rivals with inefficient operations when deciding whether or not to sell to them. Our study, however, shows that the global tax considerations result in distinct strategic choices. Specifically, with sufficiently large tax disparity, the significant potential tax savings can turn those inefficient rivals (with large alternative sourcing cost) into lucrative streams of revenue for the MNF’s upstream manufacturing subsidiary, whereas selling to those efficient rivals (with small alternative sourcing cost) is no longer attractive.

Our paper is particularly related to the growing body of research on supply chain management that considers the impacts of international tax planning. Cohen and Lee (1989) present a deterministic, mixed integer, non-linear mathematical programming model to analyze an MNF’s global resource deployment problem, when considering the presence of taxation and tariff. Li et al. (2007) study MNFs’ sourcing operations while considering local content tariff rules. Hsu and Zhu (2011) and Xu et al. (2018) address the impact of China’s export-oriented tax rules (especially the value-added tax (VAT) refunds) on the procurement, production and distribution strategies of an MNF who produces its products in China to meet demands from both overseas and domestic markets. Xiao et al. (2015) study the capacity decision of an MNF’s subsidiary when it can reduce its tax liability under a tax cross-crediting scheme. Jung et al. (2016) study the impact of arm’s length principle on firms’ profits and consumer surplus when an integrated firm sells to a downstream rival retailer. They find that the arm’s length restriction induces the rival to prefer Cournot over Bertrand competition, and may lead to a lower consumer surplus. However, the impact of tax is not considered in the paper. Shunko et al. (2017) consider tax-saving motivated strategies for an MNF to locate a product distribution division in a low-tax region.
Among this body of research, a few papers specifically study how MNFs use transfer prices to take advantage of tax-saving opportunities. Huh and Park (2013) compare an MNF’s after-tax profitability under different transfer pricing methods for transactions between its internal divisions. Shunko et al. (2014) study how an MNF should allocate its order quantities between in-house production and external sourcing by characterizing the tradeoff between the incentive role and the tax role of the transfer price. We are not aware of any research that studies the impact of tax and transfer pricing on the MNF’s decision of selling to a rival, which is the main focus of this paper.

Our paper is also related to research about global operations management. Kouvelis and Gutierrez (1997), Lu and Van Mieghem (2009), and Dong et al. (2010) study firms’ global facility location and production problems when trying to meet demands from different markets. Some other papers, including Feng and Lu (2012) and Wu and Zhang (2014), study firms’ global sourcing problem, with considerations of the tradeoff between cost saving benefit and other issues such as strategic competition and responsiveness. Our paper enriches this stream of research by considering the impact of international taxation on MNFs whose divisions reside in different tax jurisdictions.

The rest of this paper is organized as follows. Section 2 describes the model. In Sections 3 and 4, we analyze the scenarios of no-selling and selling, respectively. Section 5 analyzes the MNF’s optimal selling-to-rival decision. Extensions of transfer pricing restriction, minimum order quantity option, and imperfectly substitutable products are discussed in Section 6. Concluding remarks are provided in Section 7. All the proofs are in the Appendix.

2 The Model

Consider an MNF offshoring its production to its upstream manufacturing subsidiary that resides in a foreign country with tax rate \( \tau_l \). The products are sold at a per unit transfer price \( t \) to the MNF’s downstream retailing subsidiary that is located in the home country with tax rate \( \tau_h \). To model the MNF’s incentive to transfer profits from its downstream to upstream subsidiary via the transfer price, we assume the home-country tax rate is higher,
i.e., $\tau_h \geq \tau_l$. We can show that our main results qualitatively hold under general tax disparity. The MNF operates under the decentralized mode, under which the MNF makes the transfer price decision with the objective of maximizing its total after-tax profits but delegates the order quantity decision to the retailing subsidiary whose objective is to maximize its own after-tax (or equivalently, before-tax) profits.

The MNF’s headquarter controls the transfer price decision because the transfer price directly affects the MNF’s taxable incomes in each country and thus its global after-tax profits. The ordering decision, however, is often delegated to the local subsidiary which is much closer to the customer and thus has better knowledge about local market condition than the headquarter. See Baldenius and Reichelstein (2006) and Hiemann and Reichelstein (2012) for more detailed discussions on the common use of such a semi-decentralized system in MNFs. Further, MNFs often employ the so-called mandated internal sourcing policy where the local subsidiary is required to source input or product from its upstream manufacturing subsidiary. As discussed in Baldenius and Reichelstein (2006), the policy of mandated internal sourcing may be the result of established relationship-specific investment in upstream or high transaction cost for switching to an outside supplier. As a concrete example for such mandated internal sourcing practice, Locke Chemical Company controls the transfer price decision on the internal chemical material called MNB, which is produced and transferred from its Consumer Division to its General Chemicals Division, and enforces the mandated internal sourcing policy. But the order volume decision is delegated to the General Chemicals Division (Miller 1993, Scott 1994). Similar semi-decentralized structure with mandated internal sourcing also appears in Hobbes Instrument Company and Paine Chemical Company (Eccles 1985).

In addition to selling to its downstream retailing subsidiary, the MNF may also sell to a rival firm who competes with the MNF’s retailing subsidiary in the downstream consumer market. Under the selling scenario, the MNF offers a wholesale price $w$ which is accepted by the rival, and also decides the transfer price $t$. Under the no-selling scenario, the rival orders the products from an alternative source (in-house production or an outside sourcing option) with per unit cost $c$, and the MNF determines the transfer price $t$. We restrict our
analysis to the setting where the MNF’s manufacturing subsidiary is more cost efficient than the rival’s alternative source by normalizing the manufacturing subsidiary’s production cost to zero.

The MNF’s incentives to reduce the overall tax liability through manipulating transfer price are restricted by some transfer pricing regulations, among which a very famous one is the arm’s length principle (ALP) imposed by the Organisation for Economic Co-operation and Development (OECD). In practice, different methods are used to conform to the ALP, and the market-based comparable uncontrolled price (or CUP) method is most commonly used (Baldenius et al. 2004, OECD 2008). It requires the price charged in a controlled transaction, i.e., the internal transfer price between the MNF’s different divisions, should be consistent with the price charged in a comparable uncontrolled transaction in comparable circumstances (OECD 2010).

When the enforcement of CUP method is impossible, which is often the case, the MNF could choose to determine the transfer price according to the ALP by any non-market-based method, such as the cost plus method, the resale price method, etc (Baldenius et al. 2004, Hammami and Frein 2014). Furthermore, for a given transfer price method, the MNF can resort to a supporting set of benchmarks, which give rise to a range of transfer prices acceptable to the tax authority. When the MNF’s transfer price falls within this arm’s length range, the tax administration should not make a transfer pricing adjustment to another point in the range (OECD 2011). As we can see, the MNF has much flexibility or discretion in transfer price decision as a result of the flexibility in transfer price method and benchmark set used. Indeed, Clausing (2003) finds direct evidence of how the prices of intrafirm transactions differ from those of non-intrafirm transactions. De Simone (2016) empirically shows that MNFs engage in more tax-motivated income shifting following adoption of a common set of accounting standards, which expand the set of potential benchmark firms available to the MNFs for transfer price decisions.

In our model, if the MNF sells to the rival, then we assume that the MNF uses the market-based CUP transfer price method, which requires the internal transfer price should be equal to the external wholesale price charged to the rival, i.e., we assume that \( t = w \). Hereafter,
we will refer this as *parity pricing* requirement. If the MNF decides not to sell to the rival, then we assume that the MNF resorts to other non-market-based transfer pricing methods and that the MNF’s transfer price must be greater than or equal to its upstream production cost, which is assumed to be zero without loss of generality. Therefore, our assumption on the transfer price without selling to the rival in our base model (i.e., the transfer price should be less than the retail price) is consistent with Samuelson (1982), Narayanan and Smith (2000) and Wang et al. (2016). Our assumption on the transfer price without selling to the rival later in our extension (i.e., the transfer price should be less than an upper bound $T$) is consistent with Shunko et al. (2014) and Wu and Lu (2018).

Under both the no-selling and selling scenarios, after the pricing decisions are made, the rival and the MNF’s retailing subsidiary engage in Cournot competition with the inverse demand function $p = a - q_D - q_R$, where $a$ is the market potential, and $q_D$ and $q_R$ are the order quantities of the downstream subsidiary and the rival, respectively. We assume $c \leq \frac{a}{2}$ to guarantee that the rival survives in the final product market under the no-selling scenario. We assume that the sourcing costs and the demand function are common knowledge to the MNF and the rival, an assumption that is not unreasonable given the prevalence of supply chain information platforms in today’s global sourcing environment (Nagarajan and Bassok 2008, Sodhi and Tang 2013). Figure 1 depicts the supply chain consisting of the decentralized MNF and the rival.

The sequence of events (see Figure 2) is summarized as follows. First, the MNF decides whether or not to sell to the rival. Second, under the no-selling scenario, the MNF sets the internal transfer price $t$; under the selling scenario, the MNF decides on a wholesale price $w$ subject to the rival’s acceptance (and sets the transfer price $t$ equal to $w$). Third, under both scenarios, the downstream retailing subsidiary and the rival make order quantity decisions $q_D$ and $q_R$ simultaneously.

Knowing that the rival can buy from both the MNF and the alternative source, the MNF should not offer a wholesale price that is higher than the rival’s alternative sourcing cost, i.e., $w$ should be less than or equal to $c$. This is because the rival can buy a very small amount from the MNF and the rest of the order from its alternative source. Doing so can force the
MNF to set its internal transfer price to be equal to the wholesale price due to parity pricing requirement. Thus, the MNF has very little profit gain from selling to the rival because of the small quantity ordered, but sacrifices flexibility in setting its own transfer price. On the other hand, if the MNF offers a wholesale price that is lower than the rival’s alternative sourcing cost, then the rival, if it accepts the offer, is better off by sourcing exclusively from the MNF.
3 No-Selling to the Rival

In this section, we analyze the scenario under which the MNF decides not to sell the products to the rival. The MNF makes the transfer price decision to maximize its total after-tax profits. After that, both the downstream retailing subsidiary and the rival make the order quantity decisions to maximize their own profits. We use backward induction to characterize the subgame perfect equilibrium.

Given the transfer price $t$, the retailing subsidiaries’ and the rival’s optimal order quantity decisions in equilibrium, denoted by $q_{NS}^D(t)$ and $q_{NS}^R(t)$, are the solutions to the following Cournot competition game: $\max_{q_D} (a - q_D - q_R - t)q_D$ and $\max_{q_R} (a - q_D - q_R - c)q_R$. Solving these two optimization problems, we have that

$$q_{NS}^D(t) = \frac{a + c - 2t}{3},$$
$$q_{NS}^R(t) = \frac{a + t - 2c}{3}.$$

Given these optimal quantity decisions, the MNF decides the transfer price $t \geq 0$ to maximize its global after-tax profits $\Pi_{NS}^M(t)$, which is equal to $tq_{NS}^D(t)(1 - \tau_l) + [a - q_{NS}^D(t) - q_{NS}^R(t) - t]q_{NS}^D(t)(1 - \tau_h)$. The results under no-selling scenario are summarized in the following proposition.

**Proposition 1.** Under no-selling scenario, the MNF’s optimal transfer price is

$$t^{NS} = \frac{(a + c)(4\Delta - 1)^+}{(4 + 8\Delta)},$$

where $x^+ \equiv \max\{x, 0\}$ and $\Delta \equiv (\tau_h - \tau_l)/(1 - \tau_l)$.

The MNF’s optimal after-tax profits are

$$\Pi_{NS}^M = \Pi_{NS}^M(t^{NS}),$$
and the rival’s optimal profits are

$$\Pi_{NS}^R = (a + t_{NS} - 2c)^2(1 - \tau_h)/9.$$  

(1)

Note that $\Delta$ increases in $\tau_h$ and decreases in $\tau_l$, suggesting that $\Delta$ reflects the degree of tax disparity faced by the MNF’s two subsidiaries. We assume $\Delta \leq 1/2$ to facilitate our analysis, which is consistent with the tax rates in most countries. In setting the transfer price, the MNF needs to balance the tradeoff between the following two opposing forces. From a tax saving perspective, the MNF is enticed to increase the transfer price in order to transfer more pre-tax profits from the higher-tax downstream retailing subsidiary to the lower-tax upstream manufacturing subsidiary. However, increasing the transfer price would not only push the retailing subsidiary to further distort its order quantity downward but also induce the rival to order more from its alternative sourcing option, thereby worsening the double marginalization problem and resulting in more intense competition from the rival, both of which hurt the downstream retailing subsidiary’s pre-tax profits. When tax disparity is small ($\Delta \leq 1/4$), the concern over weakening profits from the retailing division due to higher transfer price outweighs the relatively weaker incentive for tax saving. The MNF therefore sets its transfer price at the supplying division’s marginal cost (i.e., $t_{NS} = 0$) to mitigate the negative effect of double marginalization—a behavior that is consistent with the well-known rule prescribed in a tax-free setting (Hirshleifer 1956). When the tax disparity widens (i.e., $\Delta > 1/4$), there is a stronger incentive to transfer profits, thereby pushing the optimal transfer price $t_{NS}$ upward above the marginal cost and the downstream retailing subsidiary’s order quantity downward; in response to the softened competition in the retail market, the rival increases its order quantity (i.e., $q_{NS}^D(t_{NS})$ decreases and $q_{NS}^R(t_{NS})$ increases in $\Delta$).

4 Selling to the Rival

In this section, we turn to the scenario under which the MNF decides to sell to the rival by offering a wholesale price that is acceptable to the rival. Due to the parity pricing require-
ment, the transfer price charged to the downstream retailing subsidiary must be equal to the wholesale price offered to the rival. Therefore, the MNF only decides the wholesale price (which should not be higher than $c$ as discussed in Section 2) to maximize its total after-tax profits subject to the rival’s participation constraint. After that, both the downstream retailing subsidiary and the rival make the order quantity decisions to maximize their own profits. We use backward induction once more to characterize the subgame perfect equilibrium.

Given the wholesale price $w$ and the rival’s acceptance of the price, the retailing subsidiary’s and the rival’s optimal order quantity decisions in equilibrium, denoted by $q_{SD}(w)$ and $q_{SR}(w)$, are the solutions to the following symmetric Cournot game: 

$$
\max q_{SD}(a - q_D - q_R - w)q_D \quad \text{and} \quad \max q_{SR}(a - q_D - q_R - w)q_R.
$$

Solving these two optimization problems, we have that 

$$
q_{SD}(w) = q_{SR}(w) = \frac{(a - w)}{3},
$$

under which the rival’s profits are 

$$
\Pi_{SR}(w) = \frac{(a - w)^2(1 - \tau_h)}{9}.
$$

If the rival rejects the MNF’s offer price $w$, then the rival would source from its alternative option and the game proceeds under the no-selling scenario, such that the rival would earn $\Pi_{RS}^{NS}$ (defined in equation (1)). In contrast, if the rival accepts the MNF’s offer, then the rival would earn $\Pi_{SR}^S(w)$. Therefore, to ensure the rival’s acceptance, we need to have $\Pi_{SR}^S(w) \geq \Pi_{RS}^{NS}$, which after some algebra reduces to $w \leq \bar{w} = 2c - t^{NS}$.

Consequently, the MNF solves the following optimization problem to obtain the optimal wholesale price, with the objective of maximizing its global after-tax profits:

$$
\max_{w \leq \min\{c, \bar{w}\}} \Pi_M^S(w),
$$

where

$$
\Pi_M^S(w) = w[q_{SD}(w) + q_{SR}(w))(1 - \tau) + [a - q_{SD}(w) - q_{SR}(w) - w]q_{SD}(w)(1 - \tau_h).
$$
The results under selling scenario are summarized in the following proposition.

**Proposition 2.** Under selling scenario, the MNF’s optimal selling price is \( w^S = \min\{c, \bar{w}, \tilde{w}\} \), where \( \tilde{w} \equiv a(2 + \Delta)/(5 + \Delta) \) is the unconstrained maximizer of \( \Pi^S_M(w) \).

The MNF’s optimal after-tax profits are

\[
\Pi^S_M = \Pi^S_M(w^S),
\]

and the rival’s optimal profits are

\[
\Pi^S_R = (a - w^S)^2(1 - \tau_h)/9.
\]

### 5 Selling or No-Selling?

Now we turn to our main research question: Under what conditions should the MNF sell to the rival? The following proposition provides the necessary and sufficient conditions under which the MNF is better off selling to the rival.

**Proposition 3.** The MNF is better off selling to the rival (i.e., \( \Pi^S_M \geq \Pi^N_M \)) if and only if one of the following conditions holds:

(a) \( \Delta \leq \sqrt{5} - 2 \) and \( c \leq K_1(\Delta) \),

(b) \( \sqrt{5} - 2 < \Delta < 1/4 \),

(c) \( \Delta \geq 1/4 \) and \( c \geq K_2(\Delta) \),

where \( K_1(\Delta) \) and \( K_2(\Delta) \) are increasing in \( \Delta \).

Proposition 3 shows that the MNF’s optimal selling-to-rival decision depends fundamentally on the value of the tax disparity \( \Delta \). Three regimes emerge. First, when the tax disparity is small, i.e., \( \Delta \leq \sqrt{5} - 2 \), the MNF should sell to the rival if and only if the rival’s alternative sourcing cost is no larger than a threshold (i.e., \( c \leq K_1(\Delta) \)). Second, when the tax disparity falls within a range of moderate values, i.e., \( \sqrt{5} - 2 < \Delta < 1/4 \), selling-to-rival is always beneficial for the MNF regardless of the rival’s alternative sourcing cost. Third, when the tax disparity is large, i.e., \( \Delta \geq 1/4 \), the MNF is better off by selling to the rival if and only
if the rival’s alternative sourcing cost is no less than a threshold (i.e., \( c \geq K_2(\Delta) \)). These results are depicted in Figure 3, where we set \( a = 1 \).

![Figure 3: Selling or no-selling](image)

Recalling our earlier analysis of the no-selling scenario in Section 3 when the tax disparity is relatively small (i.e., \( \Delta \leq \frac{1}{4} \)), the MNF will set the transfer price at its manufacturing division’s marginal cost to aggressively encroach on the rival in the retail market because higher retail profits dominate tax savings. This poses a credible threat to the rival in that it would face fierce competition from the downstream subsidiary under the no-selling scenario. In response, the rival is willing to accept the MNF’s offer even if the wholesale price is much higher than its alternative sourcing cost because the parity pricing requirement under ALP will soften retail competition, i.e., \( \bar{w} > c \) in this case. Although the rival’s threat of sourcing from both the MNF and the alternative option deprives the MNF’s opportunity of setting a price higher than \( c \), selling to such a highly motivated buyer would seem to be appealing to the MNF since doing so brings significant amount of wholesale profits.

However, we see from Proposition 3 (a) that when \( \Delta \leq \sqrt{5} - 2 \), selling occurs only when \( c \) is lower than a certain threshold \( K_1(\Delta) \), suggesting that when the tax disparity is relatively small, the MNF will only sell to a stronger competitor with a relatively smaller alternative sourcing cost \( c \). This is because at lower levels of \( c \), the MNF has sufficient flexibility to
ameliorate the negative impact of double marginalization caused by parity pricing. Thus, the incentive for earning additional wholesale profits outweighs the concern over losing the limited amount of retail profits in a market in which the rival is already fairly competitive. When \( c \) is high, the negative impact of parity pricing is more pronounced if the MNF sells to the rival. If the wholesale price is at the already high alternative sourcing cost \( c \), it will inflict greater damage to the firm’s retailing division due to the double marginalization effect. However, if the wholesale price is below \( c \), it will embolden the relatively weak rival (with high sourcing cost \( c \)) to compete more aggressively in the downstream retail market, again hurting the MNF’s retail profits. We see that when the rival’s alternative sourcing cost is sufficiently high, the concern over intensified downstream competition becomes the dominant factor, and the MNF is better off not selling to the rival. As the tax disparity \( \Delta \) increases over a range of still relatively small values, all else being equal, the upstream pre-tax wholesale profits become more valuable to the MNF, thereby making selling-to-rival more attractive and broadening the range of rivals to whom the MNF is willing to sell. This explains Part (a) of Proposition 3 and the result that \( K_1(\Delta) \) increases in \( \Delta \).

When the tax disparity rises over a range of moderate values (i.e., \( \sqrt{5} - 2 < \Delta < 1/4 \)), tax saving becomes so attractive that selling-to-rival is always beneficial for the MNF regardless of the rival’s alternative sourcing cost. This explains Part (b) of Proposition 3.

When the tax disparity is large (i.e., \( \Delta \geq 1/4 \)), the earlier result of selling to the rival is reversed—Proposition 3 (c) indicates that selling occurs only when \( c \) is higher than a certain threshold \( K_2(\Delta) \), suggesting that \textit{when the tax disparity is relatively large, the MNF will only sell to a weaker competitor} with a relatively larger alternative sourcing cost \( c \). To see why such a contrast emerges, we first note that with large tax disparity, the MNF has a strong desire to book more profits at its manufacturing division either through selling to the rival to gain more wholesale profits, and/or through charging a higher internal transfer price (above its product’s marginal cost) to shift more profits from its retailing division. In particular, the optimal internal transfer price under the no-selling scenario can be even higher than the rival’s alternative sourcing cost. Being aware of this, a rival with low alternative sourcing cost, who already enjoys a competitive advantage in sourcing cost relative to the MNF’s
retailing subsidiary (who is charged a high transfer price) under the no-selling scenario, has little incentive to buy from the MNF. This forces the MNF to lower the wholesale price to such an extent that it severely constrains the MNF’s ability to transfer profits. Therefore, the MNF finds selling-to-rival unattractive when the rival has sufficiently low alternative sourcing cost, and the set of unattractive rivals expands when the tax disparity increases in this regime. This explains Part (c) of Proposition 3 and the result that $K_2(\Delta)$ increases in $\Delta$.

Proposition 3 implies that in determining whether or not to sell to the rival, the MNF ought not to simply examine the rival’s alternative sourcing cost and blindly exclude those with large alternative sourcing cost so as not to sell to a rival who otherwise would be a weak competitor. Indeed, such a rationale is valid when the tax disparity is sufficiently small. However, with sufficiently large tax disparity, the significant potential tax savings can turn those weak competitors (with large alternative sourcing cost) into lucrative streams of revenue for the MNF’s upstream manufacturing subsidiary, whereas selling to strong competitors (with small alternative sourcing cost) is no longer attractive because the MNF’s threat of not selling is weakened by its tax saving incentives. In a nutshell, as the tax disparity increases, the group of rivals to whom the MNF should sell to needs to be shifted upward with regards to the rival’s alternative sourcing cost (see Figure 3), i.e., targeting more on those less competitive rivals and less on more competitive rivals.

Note that the three different ranges of tax disparity discussed above are also relevant to real-world situations. For example, suppose that an MNF’s downstream retailing subsidiary is located in the home country France with a corporate income tax rate about 33.3%. If the MNF’s upstream manufacturing subsidiary is located in China (known as the “world’s factory”) with a tax rate about 25%, then the tax disparity between the upstream and downstream subsidiaries falls into the first range, i.e., $0 \leq \Delta \leq \sqrt{5} - 2$. If the MNF’s upstream subsidiary is located in a country with a lower tax rate (e.g., Ireland with a tax rate 12.5%), then the tax disparity in this case falls into the second range, i.e., $\sqrt{5} - 2 < \Delta < 1/4$. If its upstream subsidiary resides in a tax heaven like Bermuda or Cayman Islands with nearly zero tax rate, then the tax disparity falls into the third range, i.e., $1/4 \leq \Delta \leq 1/2$. 
The above discussions suggest that the MNF’s choice of offshoring destination may have significant impacts on its strategic decision of selling to a rival.

6 Other Considerations

6.1 Non-market-based Transfer Price Restriction

In our base model, we assume that the MNF faces no restriction on setting the transfer price under the no-selling scenario. In this subsection, we relax this assumption by following a modeling approach commonly used in the literature—we assume that the MNF can justify setting its transfer price within a range of allowable arms-length prices (Baldenius et al. 2004). Specifically, we will focus on the case where the transfer price is restricted to a range of \([0, T]\), where the lower limit is the firm’s marginal cost and \(T \geq 0\) is a constant. This is consistent with Shunko et al. (2014) and Wu and Lu (2018) who assume that the transfer price should be between the upstream production cost and an exogenous upper bound. In practice, the upper bound might be related to the MNF’s upstream production cost. The higher the production cost, the higher the upper bound will be. We choose to omit the details of the analysis of the general case, where the lower limit is larger than the marginal cost, as it is more involved but does not qualitatively change the insights we develop in our base model. The following proposition confirms the robustness of our main results.

**Proposition 4.** With non-market-based transfer price restriction, the MNF is better off selling to the rival if and only if one of the following conditions holds:

(a) \(\Delta \leq \sqrt{5} - 2\) and \(c \leq \hat{K}_1(\Delta)\),
(b) \(\sqrt{5} - 2 < \Delta < 1/4\),
(c) \(\Delta \geq 1/4\) and \(c \geq \hat{K}_2(\Delta)\),

where \(\hat{K}_1(\Delta)\) and \(\hat{K}_2(\Delta)\) are increasing in \(\Delta\).

With restricted transfer price, one would expect that the MNF’s ability to gain higher tax saving through aggressive internal transfer pricing will be limited and therefore its global after-tax profits will suffer. Interestingly, we find that under plausible circumstances, the
regulatory constraint will make the MNF better-off. Specifically, denoting $\hat{\Pi}^*_M$ and $\Pi^*_M$, respectively, as the MNF’s optimal equilibrium profits with and without transfer price restriction, we have the following results.

**Proposition 5.** For any $c > a/7$, the equality $\hat{\Pi}^*_M = \Pi^*_M$ always holds; for any $c \leq a/7$, there exists a threshold $\hat{T}(\Delta, c)$ such that $\hat{\Pi}^*_M > \Pi^*_M$ if and only if $T < \hat{T}(\Delta, c)$.

Our earlier analysis (in Section 5) of the case where there is no transfer price restriction suggests that, when the tax disparity is large, the MNF under the no-selling scenario is motivated to set a high transfer price and subsequently weakens its retailing division in the retail market. Given such a favorable alternative option (of not buying from the MNF), a low-cost rival will demand a low wholesale price, which in turn will constrain the MNF’s ability to book more profits in its low-tax manufacturing division. On the other hand, if the MNF’s transfer price is relatively restrictive (i.e., $T$ is small), the same rival will be less demanding when negotiating the wholesale price because a failed deal will result in a more aggressive competitor in the retail market. Because of the higher wholesale price, the MNF’s overall global after-tax profits with restriction on transfer price may be even higher than those without restriction. Figure 4 (assuming $a = 1$, $c = 0.05$) shows that with a low value of $T$ and a high value of $\Delta$, the MNF’s overall global after-tax profits under transfer price restriction are strictly higher than those under no restriction.

![Figure 4: When does the restriction increase the MNF’s profits?](image-url)
Finally, we note that when facing a high-cost rival (i.e., \( c > a/7 \)) who is relatively less competitive, the MNF’s global after-tax profits remain the same with or without the regulatory restriction on its transfer price. The reasons are as follows. Our earlier analysis suggests that when a rival is less competitive, it is motivated to buy from the MNF because the parity pricing requirement under ALP will soften its opponent in the retail market. When such a rival is sufficiently weak (with \( c > a/7 \)), the MNF can charge the same price \( \min\{c, \tilde{w}\} \) with or without the non-market-based restriction. Clearly, in this case, the MNF’s overall profitability is unaffected by the regulatory restriction.

6.2 Minimum Order Quantity Option

In our base model, we assume that under selling the MNF should set a wholesale price less than or equal to the alternative sourcing cost to avoid the rival sourcing from both the MNF and the alternative option. In this subsection we relax this assumption, and allow the MNF to set a minimum order quantity when the wholesale price is higher than the alternative sourcing cost. Therefore, the minimum order quantity option expands the feasible set of wholesale prices to the MNF. The following proposition confirms the robustness of our main result under this relaxation. It is worth noting that in equilibrium the rival never sources from both options.

**Proposition 6.** With minimum order quantity option, the MNF is better off selling to the rival if and only if one of the following conditions holds:

(a) \( \Delta \leq \sqrt{5} - 2 \) and \( c \leq \tilde{K}_1(\Delta) \),

(b) \( \sqrt{5} - 2 < \Delta < 1/4 \),

(c) \( \Delta \geq 1/4 \) and \( c \geq \tilde{K}_2(\Delta) \),

where \( \tilde{K}_1(\Delta) \) and \( \tilde{K}_2(\Delta) \) are increasing in \( \Delta \).

The above results are depicted in Figure 5, where we set \( a = 1 \). By comparing Figures 3 and 5, we know that the minimum order quantity option expands the area of selling, which results from the expanded set of feasible prices.

Our earlier analysis in the base model shows that a rival may strategically source from
Figure 5: Selling or no-selling with minimum order quantity option

the MNF because the parity pricing requirement will soften the competition from the global firm’s retailing division (i.e., \( \bar{w} \) may be higher than \( c \)). The rival’s threat of sourcing from both options, however, forces the MNF to set a wholesale price lower than or equal to \( c \). We observe from Figure 5 that with the minimum order quantity option, the MNF is usually able to sell to the rival at a wholesale price that is higher than \( c \), i.e., \( \tilde{w}^S > c \). This result is at odds with the conventional wisdom that a rival should always purchase from the option with the lowest price. The driver of this result is the threat of a competitive price credibly conveyed by the MNF to the rival under the no-selling scenario. We can also show that a higher selling price is associated with a higher minimum order quantity, which is set by the MNF to mitigate the rival’s incentive to buy from both the MNF and the alternative source.

6.3 Imperfectly Substitutable Products

In the base model, we assume that two downstream firms’ products are perfectly substitutable. In reality, customers may have loyalties or preferences to the products offered by different firms, and the products may not be perfectly substitutable. In this subsection, we relax the assumption of perfect competition, and assume that the two firms’ inverse demand
functions are as follows:

\[ p_D = a - q_D - \gamma q_R, \]
\[ p_R = a - q_R - \gamma q_D, \]

where \( \gamma \in [0,1] \) represents the degree of substitutability. The following proposition shows that our results are qualitatively robust with differentiated products.

**Proposition 7.** With differentiated products, the MNF is better off selling to the rival if and only if one of the following conditions holds:

(a) \( \Delta \leq \Delta_1(\gamma) \) and \( c \leq K_1(\Delta, \gamma) \),

(b) \( \Delta_1(\gamma) < \Delta < \Delta_2(\gamma) \),

(c) \( \Delta \geq \Delta_2(\gamma) \) and \( c \geq K_2(\Delta, \gamma) \).

We conduct some numerical studies to investigate how the selling and no-selling areas change as the substitution rate varies. The results are shown in Figure 6, where we set \( a = 1 \) and \( \gamma = 0, 0.5, 0.8, 0.9 \). We find that both \( K_1(\Delta, \gamma) \) and \( K_2(\Delta, \gamma) \) increase in \( \Delta \), the same as the base model with perfectly substitutable products, i.e., \( \gamma = 1 \). Furthermore, with a low substitution rate, the top-left no-selling area disappears since \( K_1(\Delta, \gamma) \) is larger than \( a/2 \) in this case. When \( \gamma \) is large enough, the top-left no-selling area emerges and continues to expand as \( \gamma \) increases. The underlying reason is that as \( \gamma \) increases, \( K_1(\Delta, \gamma) \) decreases: as downstream competition becomes more intense, the MNF would prefer not to sell to the rival since the downstream competition concern for the MNF resulting from selling arrangement becomes more significant as \( \gamma \) increases. However, the impact of \( \gamma \) on the bottom-right no-selling area is not obvious. Figure 7 (assuming \( a = 1, \Delta = 1/4 \)) shows that \( K_2(\Delta, \gamma) \) first increases and then decreases as \( \gamma \) increases. It indicates that when the tax disparity is high, more intense competition in the downstream market may induce the MNF to either supply or not supply to the downstream rival since the increasing competition intensity has two distinct effects on the MNF’s selling-to-rival incentives. On one hand, anticipating the MNF will specify a high transfer price under no-selling, the rival would demand a even lower selling price from the MNF as the competition intensity increases, which makes the MNF
less willing to sell; on the other hand, the more intense downstream competition will transfer more profits to the MNF’s upstream division which is subject to a lower tax liability, and the MNF in this case is incentivized to sell to the rival to book more profits in the low-tax upstream.

Figure 6: Selling or no-selling with imperfectly substitutable products

Figure 7: The sensitivity of $K_2(\Delta, \gamma)$
7 Conclusions

This paper uses a game-theoretic approach to study an integrated MNF who produces a product in a low-tax country and sells it in a high-tax country. The global firm faces the decision of whether to sell the product (and at what price) to an external rival in the retail market who has an outside sourcing option. Our findings suggest that elements of global tax planning, in particular the tax disparity between the MNF’s manufacturing and retailing subsidiaries and the regulatory restriction on the global firm’s transfer pricing, will fundamentally influence the MNF’s strategic decision of selling to a rival. Specifically, we find that when the tax disparity (representing the attractiveness of tax saving for the MNF) is low, the MNF will only sell to a low-cost (and more competitive) rival. However, when tax disparity (or tax saving incentive) is high, the opposite occurs—the MNF will only sell to a high-cost (and less competitive) rival. Our study also finds that under plausible circumstances, the MNF facing regulatory restriction on its non-market-based transfer pricing could make even higher global after-tax profits as compared to the case without the restriction.

Our current model assumes that all cost and tax information are common knowledge to all players. A reasonable extension is to allow asymmetric information—especially when the rival does not have full information on the MNF’s non-market-based transfer pricing restrictions. Another limitation of the current paper is that we assume both the MNF and the rival have enough capacities to produce the products. In reality, their production decisions may be constrained by their capacity levels. Incorporating the capacity investment decisions makes our model more complicated and some further assumptions are needed for tractability. We leave this for future research. Our current model assumes that the MNF only owns one plant. In practice, an MNF is more likely to have multiple plants in multiple countries subject to different tax rates. In the future, it would be interesting to investigate which plant should be used to sell to rivals and which plant should not, and even the ultimate plant location decisions of the MNF.
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