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ABSTRACT

The Lerner Symmetry Theorem (Lerner, 1936) establishes the equivalence between import tariffs and export taxes in a simple neoclassical economy with two countries, two final goods, and no trade costs. In this paper we provide a number of generalizations and qualifications of this well-known result. Among other things, we show that the absence of trade deficits is neither necessary nor sufficient for Lerner Symmetry to hold. We conclude by discussing its implications for border tax adjustments.

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1 Introduction

When should one country be concerned about changes in its neighbor's tax system? What type of policies should be deemed protectionist and regulated by the World Trade Organization? What type of tax reforms are neutral in a global economy? How do global imbalances and global supply chains affect, if at all, the answers to these questions?

The Lerner Symmetry Theorem (Lerner, 1936) provides an important starting point for thinking about tax neutrality in a global economy. It establishes the equivalence between import tariffs and export taxes and, as a corollary, the neutrality of any tax reform that would increase import tariffs and export subsidies by the same amount.

The Lerner Symmetry Theorem was originally derived in a simple neoclassical economy with two countries, two final goods, no trade costs, and no distortionary taxes. Over the last eighty years, both the world economy and trade theory have changed. Multinational firms, imperfect competition, and trade costs are now part of the workhorse models in international trade. Due to these advancements, a result as important as the Lerner Symmetry Theorem deserves a modern treatment.

Our goal to offer a number of generalizations and qualifications of this well-known result. We first consider a general Arrow-Debreu economy with linear taxes. In this context, we highlight three sufficient conditions for Lerner Symmetry to hold. The first one relates to the fragmentation of production across countries; the second one relates to the possibility of consumption in multiple countries; and the third relates to foreigners' holdings of domestic assets. Among other things, we show that the absence of trade imbalances is neither necessary nor sufficient for Lerner Symmetry to hold.

We then illustrate how the same formal argument can be extended to economies where firms have market power, consumers have behavioral biases, taxes are non-linear, and prices are sticky. Motivated by the influential work of Auerbach and coauthors (see Auerbach et al. 2017 for a recent summary), we conclude by discussing the implications of our results for border tax adjustments.

We are not the first to offer generalizations and qualifications of Lerner's (1936) original theorem. McKinnon (1966) establishes the robustness of Lerner Symmetry Theorem to the introduction of traded intermediate goods. Ray (1975) argues that symmetry breaks down under monopoly pricing, though his proof implicitly relies on the assumption that demand functions are not homogeneous of degree zero in prices. Once homogeneity of degree zero is restored, Lerner Symmetry remains valid under monopoly pricing, a point emphasized by Eaton, Grossman, Kaempfer and Tower (1983).

Most closely related to our work is Kaempfer and Tower (1982) who establish a general

version of Lerner Symmetry Theorem in an environment where all balance of payment debits and credits can be taxed and subsidized. In the absence of such general taxes and subsidies, Lerner Symmetry breaks down, for instance, in the presence of cross-country asset holdings, as recently discussed in Blanchard (2009). Compared to existing work, we focus on a more general environment; we offer a simpler proof of Lerner Symmetry Theorem; and we derive new insights about the conditions under which one should expect tax reforms to be neutral, including the nature of multinational production and the composition of foreign asset positions.

The Lerner Symmetry Theorem has direct implications for the equivalence between currency and fiscal devaluation. As originally noted by Keynes (1931), and more recently studied by Farhi, Gopinath and Itskhoki (2014), a government can mimic the effect of a currency devaluation by combining an import tariff with an export subsidy. In economies with flexible exchange rate, the Lerner Symmetry Theorem implies that such combination should be neutral, a point emphasized by Staiger and Sykes (2010).

As we discuss at the end of the paper, the Lerner Symmetry Theorem also provides a natural starting point to study the neutrality of border tax adjustments. In this respect, our analysis generalizes the neutrality results in Meade (1974) and Grossman (1980).

The rest of the paper is organized as follows. Section 2 derives a general Lerner Symmetry Theorem in a neoclassical environment. Section 3 extends our benchmark result to non-neoclassical environments. Section 4 concludes with an application to border tax adjustments.

2 The Neoclassical Benchmark

2.1 Economic Environment

Consider a world economy comprising many countries, many commodities, many firms, and many households. In principle, firms may produce and sell commodities in multiple countries. Likewise, households may work and consume around the world.

Taxes. All economic transactions between a buyer and a seller may be subject to taxation. Taxes may vary across source and destination countries, across commodities, as well as across firms and households.

Let $t_{ij}^k(n)$ denote the ad-valorem tax imposed by country j on a buyer n who purchases commodity k in that country from a seller producing in country i. The buyer n may be either a household, purchasing a final good, or a firm, purchasing intermediate inputs or

labor services. We impose no restriction on the sign of $t_{ij}^k(n)$. If $i \neq j$, then $t_{ij}^k(n) \geq 0$ corresponds to an import tariff, whereas $t_{ij}^k(n) \leq 0$ corresponds to an import subsidy.

Let $s_{ij}^k(n)$ denote the ad-valorem tax imposed by country i on a seller n who produces commodity k in that country and sells it in country j. Again, a seller may be either a firm or a household and we impose no restriction on the sign of $s_{ij}^k(n)$. If $i \neq j$, then $s_{ij}^k(n) \geq 0$ corresponds to an export subsidy, whereas $s_{ij}^k(n) \leq 0$ corresponds to an export tax.

Tax revenues in each country i are rebated lump-sum to the set of households, H_i, who are resident of that country. $\tau(h)$ denotes the lump-sum transfer to household h.

Firms. Each firm f chooses its input vector, $m(f) \equiv \{m_{ij}^k(f)\} \geq 0$, and its output vector, $y(f) \equiv \{y_{ij}^k(f)\} \geq 0$, in order to maximize its profits taking as given the untaxed prices of commodities, $p \equiv \{p_{ij}^k\}$, as well as the schedule of taxes and subsidies that it faces, $t(f) \equiv \{t_{ij}^k(f)\}$ and $s(f) \equiv \{s_{ij}^k(f)\}$. Formally, firm f's profit maximization problem is

$$\pi(f) \equiv \max_{(m(f),y(f))\in\Omega(f)} p(1+s(f)) \cdot y(f) - p(1+t(f)) \cdot m(f), \tag{1}$$

where we let $\Omega(f)$ denote firm f's production set and we use the convention $p(1+s(f)) \equiv \{p_{ij}^k(1+s_{ij}^k(f))\}$ and $p(1+t(f)) \equiv \{p_{ij}^k(1+t_{ij}^k(f))\}$, with $\cdot$ the scalar product of two vectors. In what follows, we let $\pi_i(f) \equiv \sum_{j,k}[p_{ij}^k(1+s_{ij}^k(f))y_{ij}^k(f) - p_{ji}^k(1+t_{ji}^k(f))m_{ji}^k(f)]$ denote the profits deriving from production in country i.

Households. Each household h chooses its consumption vector, $c(h) \equiv \{c_{ij}^k(h)\} \geq 0$, as well as its supply of services, $l(h) \equiv \{l_{ij}^k(h)\} \geq 0$, in order maximize her utility taking as given untaxed prices as well as taxes and subsidies. Letting $u(\cdot;h)$ denote her utility function and $\Gamma(h)$ denote the set of feasible bundles, $(c(h), l(h))$, the utility maximization problem of household h can be expressed as

$$\begin{aligned} \max_{(c(h),l(h))\in\Gamma(h)} \quad & u(c(h)-l(h);h) \\ & p(1+t(h)) \cdot c(h) = p(1+s(h)) \cdot l(h) + \pi \cdot \theta(h) + \tau(h) \end{aligned} \tag{2}$$

where $\pi \equiv \{\pi(f)\}$ is the vector of firms' profits and $\theta(h) \equiv \{\theta(f,h)\}$ is the vector of firms' shares by household h. Endowments, of either goods or factors, can be treated as shares of simple firms.

Market Clearing. For all commodities, supply is equal to demand. In vector notation, this can be expressed compactly as

$$\sum_f y(f) + \sum_h l(h) = \sum_h c(h) + \sum_f m(f). \tag{3}$$

Government. In any country i, the government's budget is balanced,

$$\sum_{j,k} p_{ji}^k \Big(\sum_h t_{ji}^k(h) c_{ji}^k(h) + \sum_f t_{ji}^k(f) m_{ji}^k(f)\Big) - \sum_{j,k} p_{ij}^k \Big(\sum_h s_{ij}^k(h) l_{ij}^k(h) + \sum_f s_{ij}^k(f) y_{ij}^k(f)\Big) = \sum_{h \in H_i} \tau(h). \tag{4}$$

Competitive Equilibrium. A competitive equilibrium with taxes, $t \equiv \{t_{ij}^k(n)\}$ and $s \equiv \{s_{ij}^k(n)\}$, and lump-sum transfers, $\tau \equiv \{\tau(h)\}$, corresponds to $c \equiv \{c(h)\}$, $l \equiv \{l(h)\}$, $m \equiv \{m(f)\}$, $y \equiv \{y(f)\}$, and $p \equiv \{p_{ij}^k\}$ such that: (i) $(m(f), y(f))$ solves (1) for all f; (ii) $(c(h), l(h))$ solves (2) for all h; and (iii) conditions (3) and (4) hold.

2.2 A General Lerner Symmetry Theorem

Fix some country i_0 with ad-valorem taxes on buyers and sellers located in that country, $t_{i_0} \equiv \{t_{ji_0}^k(n)\}$ and $s_{i_0} \equiv \{s_{i_0 j}^k(n)\}$, and domestic lump-sum transfers, $\tau_{i_0} \equiv \{\tau(h)\}_{h \in H_{i_0}}$. We are interested in characterizing the set of neutral tax reforms in that country. Throughout this paper, we rely on the following definition.

Definition 1. *Given taxes and lump-sum transfers in the rest of the world, a tax reform from (t_{i_0}, s_{i_0}) to $(\tilde{t}_{i_0}, \tilde{s}_{i_0})$ in country i_0 is neutral if there exist domestic lump-sum transfers, $\tilde{\tau}_{i_0}$, such that the set of equilibrium allocations (c, l, m, y) is the same under $(t_{i_0}, s_{i_0}, \tau_{i_0})$ and $(\tilde{t}_{i_0}, \tilde{s}_{i_0}, \tilde{\tau}_{i_0})$.*

Our generalization of the Lerner Symmetry Theorem emphasizes three conditions under which tax reforms in country i_0 are neutral.

A1. *For any firm f, production possibilities in country i_0 are independent of possibilities in other countries,*

$$\Omega(f) = \Omega_{i_0}(f) \times \Omega_{-i_0}(f),$$

where $\Omega_{i_0}(f)$ denotes the set of feasible input-output vectors, $(\{m_{ji_0}^k(f)\}, \{y_{i_0 j}^k(f)\})$, in country i_0 and $\Omega_{-i_0}(f)$ denotes the set of feasible vectors, $(\{m_{ji}^k(f)\}_{i \neq i_0}, \{y_{ij}^k(f)\}_{i \neq i_0})$, in other countries.

A2. *For any domestic household $h \in H_{i_0}$, there is no consumption or employment abroad,*

$$c_{ij}^k(h) = l_{ji}^k(h) = 0 \text{ for any } i, \text{ any } k, \text{ and any } j \neq i_0,$$

for any foreign household $h \notin H_{i_0}$, there is no consumption or employment in country i_0,

$$c^k_{ii_0}(h) = l^k_{i_0 i}(h) = 0 \text{ for any } i \text{ and any } k.$$

A3. *For any foreign household $h \notin H_{i_0}$, the net value of assets held in country i_0 is zero,*

$$\pi_{i_0} \cdot \theta(h) = 0,$$

where $\pi_{i_0} \equiv \{\pi_{i_0}(f)\}$ is the vector of firms' profits deriving from production in i_0.

Under the three previous conditions, a general Lerner Symmetry Theorem can be stated as follows.

Theorem 1. *Suppose that A1-A3 hold. Then any tax reform from (t_{i_0}, s_{i_0}) to $(\tilde{t}_{i_0}, \tilde{s}_{i_0})$ is neutral if (i) cross-border taxes satisfy*

$$1 + \tilde{t}^k_{ji_0}(n) = \eta(1 + t^k_{ji_0}(n)) \text{ for all } j \neq i_0 \text{ and } k,$$
$$1 + \tilde{s}^k_{i_0 j}(n) = \eta(1 + s^k_{i_0 j}(n)) \text{ for all } j \neq i_0 \text{ and } k,$$

and (ii) local taxes satisfy

$$1 + \tilde{t}^k_{i_0 i_0}(n) = \lambda^k(1 + t^k_{i_0 i_0}(n)) \text{ for all } k,$$
$$1 + \tilde{s}^k_{i_0 i_0}(n) = \lambda^k(1 + s^k_{i_0 i_0}(n)) \text{ for all } k,$$

with $\eta > 0$ and $\lambda^k > 0$.

Proof. We follow a guess and verify strategy. Given prices, $\{p^k_{ij}\}$, and lump-sum transfers, $\tau_{i_0}(h)$, in the original equilibrium with taxes (t_{i_0}, s_{i_0}), let us construct the new equilibrium prices such that for all k,

$$\tilde{p}^k_{ij} = p^k_{ij}/\eta \text{ if either } i \neq i_0 \text{or } j \neq i_0,$$
$$\tilde{p}^k_{i_0 i_0} = p^k_{i_0 i_0}/\lambda^k, \text{ otherwise,}$$

and the new lump-sum transfers such that

$$\tilde{\tau}(h) = p(1 + \tilde{t}(h)) \cdot c(h) - p(1 + \tilde{s}(h)) \cdot l(h) - \tilde{\pi} \cdot \theta(h) \text{ for all } h \in H_{i_0},$$

with $\tilde{\pi} \equiv \{\tilde{\pi}(f)\}$ the vector of firms' profits under the new tax schedule,

$$\tilde{\pi}(f) = \sum_{i,j,k} [\tilde{p}^k_{ij}(1 + \tilde{s}^k_{ij}(f))y^k_{ij}(f) - \tilde{p}^k_{ji}(1 + \tilde{t}^k_{ji}(f))m^k_{ji}(f)].$$

By construction, the after-tax prices faced by firms are either unchanged in country i_0 or divided by η in other countries. Under condition A1, this implies that the solution to the profit maximization problem, $(m(f), y(f))$, must be unchanged for all firms in all countries, whereas the value of profits associated with production in country i_0 must be unchanged and divided by η in other countries. Under condition A3, this implies that the income of households in country $i \neq i_0$ must be divided by η. Together with condition A2, it follows that the solution to the utility maximization problem, $(c(h), l(h))$, must be unchanged for all $h \notin H_{i_0}$. In country i_0, lump-sum transfers are constructed such that the budget constraint of any household still holds. Since prices are unchanged in country i_0, it follows that the solution to the utility maximization problem, $(c(h), l(h))$, must also be unchanged for any $h \in H_{i_0}$. To conclude note that good market clearing conditions (3) and the government's budget balance (4) in any country $i \neq i_0$ must still trivially hold. Thus, the government's budget constraint in country i_0 must also hold by Walras' law. □

2.3 Discussion

In a general Arrow-Debreu economy, such as the one that we consider, a proportional change in all taxes should leave the set of equilibrium allocations unchanged as discussed, for instance, by Diamond and Mirrlees (1971). Such a reform would necessarily leave relative prices unchanged. In addition, any increase in the overall price levels faced by households and firms that it may trigger would be exactly matched by an increase in the government's tax revenues.

One can think of Theorem 1, as well as the original Lerner Symmetry Theorem, as an alternative neutrality result that allows for more flexible tax reforms, namely reforms that only require uniform changes across trade taxes. In Lerner (1936), one can think of the initial tax schedule as an import tariff on the first commodity, $t^1_{ji_0}(n) = t$, with all other taxes being zero, and as the new tax schedule as an export tax, $s^2_{i_0j}(n) = s$, with all other taxes being zero. Provided that $1 + s = 1/(1 + t)$, 1 states that such a reform, which corresponds to $\eta = 1/(1 + t)$, would be neutral. For the exact same reason, starting from no taxes, a uniform increase in import tariff and export subsidy such that $1 + t = 1 + s = \eta$, is neutral. We come back to this point when discussing border tax adjustments in Section 4.

A stronger neutrality result, that allows for more flexible tax reforms, of course, requires stronger assumptions on technology, preferences and the allocation of property rights. The main contribution of our analysis is to clarify the nature of these restrictions.

The first of our sufficient condition, A1, is a restriction on technology that requires the separability of firm's decision across markets. Under this assumption, although there may be global supply chains, in the sense that a firm from Japan may export intermediate goods to China, combine these goods with Chinese labor to produce final goods, and export those to the United States, it is as if all firms operating in country i_0 were "domestic" firms. These firms may sell output in foreign markets and buy inputs from abroad, but they are domestic in the sense that all their transactions are subject to "domestic" taxes, i.e. those imposed by country i_0 at the border. In such an environment, which is the one considered by Lerner and the rest of the literature, higher trade taxes in country i_0, $\eta > 1$, accompanied by lower prices abroad, as described in the proof of Theorem 1 would have no effect on the relative price by any individual firm.

A1 is a potentially strong restriction. Suppose, for instance, that the same CEO, a scarce input, manages affiliates in China and the United States. If so, one would expect changes in the level of prices in one country relative to another to have real effects. Specifically, if the marginal value of the CEO's time goes up in the United States, she should allocate more time to the U.S. affiliate and less time to the Chinese affiliate. This is true even though both affiliates may only be selling locally and may only be subject to local taxes in these markets. Similarly, A1 is likely to be violated in economies where exporting firms located in the United States must incur distribution costs in China. In such cases, one can think of distribution services as untaxed imports. If so, a decrease in Chinese distribution costs would incentivize U.S. firms to sell more in China.

The second of our sufficient condition, A2, is the counterpart of A1 on the household side. It would hold if one were to restrict preferences so that households only derive utility from consumption of commodities in their country of residence. A simple way to think about A2 is that it rules out tourism. Intuitively, when the U.S. taxes imports and subsidizes exports, this mimics a dollar devaluation, which, with flexible exchange rates, should be offset by an appreciation of the dollar. In our proof, as mentioned above, prices in the rest of the world should go down by a factor η. For a U.S. resident who spends his vacation in France, such a dollar appreciation will not be neutral. Like in the distribution example, neutrality breaks down because French exports of services are untaxed by the U.S. government.

While the first two conditions focus on restrictions on technology and preferences such that the "relevant" relative prices remain unchanged, A3 focus on wealth effects. It

guarantees that if the the level of prices faced by households change, their wealth change by the same amount, thereby guaranteeing the neutrality of the tax reform. Although the argument is mathematically trivial, A3 clarifies two important economic points.

First, the existence of trade imbalances is neither necessary nor sufficient for the tax reforms that we consider to be neutral. For instance, the United States could have assets abroad, and run a trade deficit forever, or liabilities, and run a trade surplus forever. Provided that foreigners do not have assets or liabilities in the United States, and that domestic transfers can be used to offset the heterogeneous exposure of U.S. households to exchange rate movements, the tax reform that we consider in Theorem 1 would be neutral.

It is true that if the United States is currently running a trade deficit, then taxes collected through a uniform tariff on U.S. imports would exceed the subsidies paid on U.S. exports. But such changes in tax revenues would be exactly offset by the increase in prices faced by U.S. households, leaving consumption and production, both in the United States and the rest of the world, unchanged.

Second, there is an asymmetry between U.S. and foreign assets and liabilities. According to A3, it is not just that gross rather than net foreign asset positions matter, but rather that only the gross assets position of foreigners in the United States matters. In the case of U.S. assets abroad, any change in value caused by a tax reform satisfying the conditions of Theorem 1 must be exactly offset by a change in tax revenues and, in turn, the lump-sum transfers to the households. In contrast, in the case of foreign assets in the United States, there are no transfers abroad to compensate foreign households for changes the value of their assets.

3 Beyond the Neoclassical Benchmark

Having provided a general proof of the Lerner Symmetry Theorem in neoclassical economies, we now briefly describe how our formal argument extends to non-neoclassical economies.

Imperfect Competition Consider the same economic environment as in Section 2, except for the fact that firms no longer behave as price-takers. Namely, suppose that the profit-maximization problem generalizes

$$\max_{(m(f),p(f),y(f))\in\Omega(f,\{m(f'),p(f'),y(f')\}_{f'\neq f})} p(f)(1+s(f))\cdot y(f) - p(f)(1+t(f))\cdot m(f), \quad (5)$$

with the feasible set $\Omega(f, \{m(f'), p(f'), y(f')\}_{f' \neq f})$ now a function of the quantities and prices chosen by other firms. Bertrand competition, in the absence of trade in intermediate goods, corresponds to the special case where given the prices chosen by its competitors, $\Omega(f, \{m(f'), p(f'), y(f')\}_{f' \neq f})$ determines the residual demand curve faced by firm f. Cournot competition corresponds to the special case where given the quantities chosen by its competitors, $\Omega(f, \{m(f'), p(f'), y(f')\}_{f' \neq f})$ determines the inverse of the residual demand curve faced by each firm. For the proof of Theorem 1 to remain valid in this more general environment, it is sufficient to have (i) the solution to (5) being homogeneous of degree zero in taxes and (ii) the profit functions being homogeneous of degree one. Under both Bertrand and Cournot competition, the fact that consumers' demand is homogeneous of degree zero in all prices guarantees that the two previous are satisfied.

Behavioral Agents. For the same reason that our results do not require firms to be price-takers, Theorem 1 does not require households to be rational. Provided that demand is homogenous of degree zero in prices and Walras' law hold, our formal argument still goes through. In fact, for any tax reform such that $\lambda^k = 1$ for all k, since neutrality can be achieved entirely by a movement of the nominal exchange rate, equal to $1/\eta$, Lerner Symmetry can even hold in economies where agents are subject to nominal illusion, as in Gabaix (2014). The reason is that under such an exchange rate adjustment, all local currency prices remain unchanged after the tax reform.

Non-Linear Taxes. At a formal level, our analysis already allows non-linear taxes since the value of a tax depends on whether a firm is buying or selling a good. More generally, we could assume that taxes vary with quantities sold. As long as the tax changes that we consider are uniform in the sense of conditions (i) and (ii) in Theorem 1, one can follow the exact same guess and verify strategy to establish the validity of Lerner Symmetry in such an environment.

Nominal Rigidities. The neoclassical environment presented in Section 2 assumes flexible prices. As mentioned above, for any tax reform such that $\lambda^k = 1$ for all k, the only relative prices that needs to adjust for the proof of Theorem 1 to go through are the prices of foreign relative to domestic goods, which a movement of the nominal exchange rate can achieve. Hence, our general Lerner Symmetry Theorem can allow price stickiness provided that exchange rate is not fixed. The fact that the tax reforms considered in Theorem 1 are no longer neutral if exchange rates are fixed is, of course, the focus of the literature on fiscal devaluations mentioned in our introduction.

4 Application to Border Tax Adjustments

We conclude by discussing the implications of our theoretical results for border tax adjustments. In line with the work of Auerbach et al. (2017) arguing for a move towards destination-based profits taxation, we ask: What would happen if U.S. firms were allowed to subtract exports from their profits, while no longer being allowed to subtract imports?[1]

Consider the profits of a firm f operating in the United States, both before and after the tax adjustment. Suppose that, initially, profits are subject to an ad-valorem corporate tax, t_π, and, for expositional convenience, that there are no other taxes. Using our notation, the profits of a firm f operating in the United States before border tax adjustment can then be expressed as

$$\pi_{US}(f) = (1 - t_\pi) \sum_{j,k} [p^k_{USj} y^k_{USj}(f) - p^k_{jUS} m^k_{jUS}(f)].$$

After the border tax adjustment, the same after-tax profits are given by

$$\begin{aligned} \pi_{US}(f) =& (1 - t_\pi) \sum_k [p^k_{USUS} y^k_{USUS}(f) - p^k_{USUS} m^k_{USUS}(f)] \\ &+ \sum_{j \neq US,k} [p^k_{USj} y^k_{USj}(f) - p^k_{jUS} m^k_{jUS}(f)]. \end{aligned}$$

In the notation of Theorem 1, this corresponds to a tax reform such that $\eta = 1/(1 - t_\pi)$ and $\lambda^k = 1$ for all k. If Assumptions A1-A3 hold, this should be neutral.

Assumptions A1-A3 are by no means trivial restrictions. But it seems fair to say that there are few theoretical results in economics that are as robust as Lerner Symmetry. As already noted in Section 2.3, the fact that the United States runs a trade deficit today or owns assets abroad does not break the neutrality of border tax adjustments. What breaks neutrality is the value of foreigner's assets in the United States. In response to a border tax adjustment, the value of these assets would increase relative to foreign prices, thereby creating a positive transfer from the United States towards the rest of the world. Ultimately, of course, the key issue is not whether A3 as well as A1 and A2 hold in practice; we know that they do not. The issue is whether departures from A1-A3 are quantitatively important or not.

We conclude by noting that although VAT are often discussed in the context of border

[1]Such a change has been discussed recently in the GOP proposal for tax reform, "A Better Way." A description of the proposal can be found at://abetterway.speaker.gov/_assets/pdf/ABetterWay-TaxPolicyPaper.pdf. See also Weisbach (2017) for a detailed discussion.

tax adjustments—because exports are exempt from VAT, whereas imports are not—a VAT is unlikely to be neutral. Provided that factor supply is not perfectly inelastic, a uniform VAT or sales tax imposed would affect labor supply and, in turn, wages and other prices. Yet, VAT are legal from the point of view of the World Trade Organization, whereas the border tax adjustment described above, because it combines an (illegal) import tariff with an (illegal) export subsidy, might not be. Lerner Symmetry is a simple, but difficult idea.

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