

Taxes, Incentives, and the Exchange Rate in the Destination-Based Cash-Flow Tax System with a Border Adjustment Tax

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Introducing a destination-based cash-flow tax (DBCFT) in the United States would dramatically change the tax base for businesses. Depending on how it is implemented, it could also affect prices, wages, and the exchange rate.

Under the proposed system, businesses would be taxed on their domestic cash flow—revenue from domestic sales minus the costs of labor and domestic intermediate inputs (Auerbach 2010, Auerbach et al. 2017). Interest on enterprise debt and depreciation would not be deductible; instead, total current investment expenditure would be deductible. Exports are not taxed and imports are, because they are included in the tax base, which is also the way a destination-based valued added tax (VAT) operates. Auerbach argues that, in theory, the DBCFT will implicitly include a border tax adjustment (BTA), combining an implicit tariff on imports and subsidy to exports.

There is considerable controversy over the impact of the DBCFT, particularly (1) its incidence on businesses compared with the current profit-based tax system and (2) its effect on prices, the exchange rate, production, exports, and imports, both if it operates as theory suggests and if there is incomplete adjustment in practice. This paper focuses on the second question—the impact on markets—addressing three important sets of questions.

First, does the DBCFT affect incentives to import and export? Auerbach and Holtz-Eakin (2016) argue that with full adjustment, the DBCFT will be trade neutral (no effect on exports or imports). In theory, the combined effect of an implicit tax on imports and a subsidy to exports from the BTA will result in an appreciation of the exchange rate that will exactly offset the BTA tariff/subsidy impact on the domestic prices of imports and exports.

Second, how does the DBCFT affect market prices and wages, and to what extent do businesses pass the tax on to the goods markets? Unlike a VAT, which the government collects in goods markets, the govern-

ment collects the DBCFT based on businesses sales in the domestic market minus their deductions. Market prices and incentives are affected only if businesses behave as if there is a tax that makes the domestic sales price higher than the producer price and therefore pass the tax on to goods markets. The government does not explicitly collect the BTA; its effect on market prices depends on whether businesses include the BTA in the price of imports delivered to markets.

Third, what happens if businesses pass on only part of the price increase to markets or if the exchange rate does not adjust, so that there is incomplete adjustment in prices, wages, the exchange rate, production, and trade?

We analyze the DBCFT using a simulation model of the US economy. First, we specify scenarios in which there is full adjustment. In these scenarios, the equilibrium is trade neutral. Depending on which prices are “sticky” (slow to adjust), markets can adjust via the exchange rate or via domestic prices and wages. We analyze three scenarios with different types of price stickiness, drawing from cases considered by Buiter (2017), Freund (2017), Freund and Gagnon (2017), and Martin (2017). In all these scenarios, with full adjustment the economy achieves a trade-neutral equilibrium in the long run, but the changes in the price system are large, differ across scenarios, and would be expected to lead to serious adjustment problems.

Second, we consider what happens if the DBCFT is not fully implemented—the tax is not passed on to markets and/or the exchange rate is sticky and the trade balance rather than domestic prices adjusts. We consider three scenarios of incomplete adjustment, drawing from the literature. In these scenarios, the equilibrium is not trade neutral, with strong effects on trade incentives, exports, and imports that differ across scenarios and may raise concerns about consistency with international trade agreements.¹ In scenarios where the trade balance adjusts, real domestic consumption declines, suggesting that the DBCFT can leave consumers worse off.²

DBCFT AND VAT SYSTEMS

There are many similarities between the DBCFT and a VAT. Auerbach et al. (2017, 4) argue that the DBCFT “is equivalent in its economic impact to introducing a broad-based, uniform rate value added tax (VAT)—or achieving the same effect through an existing VAT—and making a corresponding adjustment in taxes on wages and salaries.”

The VAT provides a good starting point and comparator for understanding how the BTA works.³ It operates like a sales tax with a border adjustment component, in order to ensure that imported and domestic goods are taxed at the same rate and exports are exempt. Since it includes a rebate for VAT taxes paid on intermediate inputs and investment goods, it operates as a tax on consumption. VAT taxes are collected by the government at the border on imports and in markets for domestic sales.

The DBCFT system will operate like a VAT if it generates the same market signals as a VAT: a uniform tax on domestic and imported goods and no tax on exports. But the government does not collect taxes on imports at the border or on domestic sales at the consumer level, and it does not provide an explicit wage

1. See Hufbauer and Lu (2017) and Bown (2017) for a discussion of the trade policy implications of the DBCFT.

2. Buiter (2017) considers a scenario in which the adjustment leads to changes in the terms of trade in foreign markets, with the possibility that introducing a DBCFT leads to a depreciation rather than an appreciation of the equilibrium exchange rate. We do not consider such a scenario; in the scenarios we consider, world prices are fixed.

3. See Metcalf (1995) and Keen and Lockwood (2010) for an overview of a VAT system.

subsidy to enterprises. The fact that labor costs are deductible implies an implicit subsidy to employment. Businesses may operate as if they face these tax wedges and subsidies, because they know that the taxes affect their tax base (Auerbach and Holtz-Eakin 2016). The implicit price wedges in a DCBFT system contrast with a VAT system, in which the VAT is reported in every transaction.

Given that the DCBFT system involves implicit taxes, analyzing its impact requires specifying how the new taxes are transmitted to markets. Since the DCBFT is a new tax system, never tried anywhere, there is no historical experience to draw on in evaluating it. We therefore developed a simulation model to analyze its economy-wide effects. We consider “what if” scenarios, making plausible assumptions about how the system will operate in practice.

We start by assuming that the implicit tax wedges are passed on to markets. We simulate the effect of a DCBFT with a 20 percent tax on domestic sales minus deductions that is included in prices. On the demand side, businesses treat the tax as an implicit 20 percent tariff on imports (because imported intermediates are not deductible from the tax base). We consider different assumptions about adjustment of the exchange rate (fixed versus flexible), the balance of trade (fixed versus flexible), and the role of different specifications regarding which prices are sticky.⁴

AN ECONOMIC SIMULATION MODEL OF THE DCBFT/BTA SYSTEM FOR THE UNITED STATES

Our simulation model is a computable general equilibrium (CGE) model of the US economy.⁵ A CGE model simulates the behavior of producers and consumers interacting in markets for goods and factors of production (e.g., labor), solving for market equilibrium prices and wages that clear all markets.⁶ The model explicitly simulates how a change in tax policy affects incentives, solving for market prices, wages, and the exchange rate.⁷

The fact that labor costs are deductible in the DCBFT system implies an implicit subsidy to employment. Freund (2017) considers the implications for tax incidence across firms with substantial differences in the labor shares in value added. She argues that this heterogeneity is a potential source of incomplete price and exchange rate pass-through in the short run. We incorporate her results in designing our incomplete

4. Freund and Gagnon (2017) analyze the effect of border adjustment taxes on the real exchange rate and trade balance in countries that have introduced a VAT. They find that, in general, introducing a VAT is fully offset by a change in the exchange rate, so that there is no impact on the current account balance. Whether that mechanism will operate the same way in a DCBFT system, where the tax/subsidy wedges are implicit, is an open question. We explore both possibilities (full and partial offset).

5. CGE models have been widely used to analyze the operation of VAT systems. Arndt et al. (2009) and Go et al. (2005) introduce a VAT in a single-country CGE model (for Mozambique and South Africa, respectively), analyzing the impacts on market prices and incidence. Introducing a DCBFT in such CGE models is a straightforward extension.

6. CGE models solve for relative prices. We introduce price stickiness by specifying a reference or anchor price (e.g., consumer price index, producer price index, fixed exchange rate), which we assume is fixed due to policy intervention or unresponsive in markets and hence slow to adjust. The reference price is termed the *numeraire* price index in the literature on CGE models.

7. In a CGE model, the exchange rate is not determined in asset or financial markets. It operates through commodity markets, which determine the domestic price of exports and imports, and is functionally related to the trade balance. A depreciation of the real exchange rate (the nominal exchange rate variable deflated by the fixed price index) increases exports and decreases imports (an appreciation has the opposite effects). The model simulates two adjustment mechanisms. If the trade balance is held constant, the real exchange rate adjusts to generate exports and imports consistent with the fixed trade balance. If the real exchange rate is held constant, the trade balance adjusts.

adjustment scenarios but do not explicitly analyze the incidence effects of the labor subsidy. Although it incorporates the implicit labor subsidy, our CGE model is too aggregated to capture enough of the heterogeneity of labor shares across sectors to support incidence analysis.⁸ We focus on the macroeconomic results, such as changes in aggregate price indexes, average wages, and the exchange rate.

Full Price and BTA Adjustment

We consider three scenarios. In the first scenario, the DBCFT is fully implemented with a fixed consumer price index (CPI), domestic goods are priced 20 percent higher than export goods in the market, and a 20 percent BTA is imposed on imports. The impact of this scenario on the price system is equivalent to that of the VAT—the case considered by Martin (2017). In the second scenario, the exchange rate is fixed and the CPI adjusts—the case considered by Cline (2017) and Freund (2017). In the third scenario, the tax is not passed on to the domestic market, the CPI is fixed, and the exchange rate adjusts—the case Auerbach (2017) considers. In all three scenarios, the balance of trade is constant, consistent with a trade-neutral DBCFT.

Under the first scenario (table 1, column 1), the nominal exchange rate adjusts, appreciating by 15 percent. While the appreciation achieves trade neutrality, it does not adjust by the full amount of the BTA (20 percent), because of other tariffs and commodity taxes (e.g., state and local sales taxes) in the economy.⁹ Producer prices adjust by the same amount as the nominal exchange rate, however, so there is no change in the relative prices of traded and nontraded goods and essentially no change in real exports and imports. The system is trade neutral, as theory suggests.

In the second scenario, in which the nominal exchange rate is fixed (column 2), the real effects are the same as when the CPI is fixed: essentially no change in real exports and imports. However, the nominal price effects are dramatically different. The CPI and the average wage increase by almost 20 percent. Domestic price adjustment is an alternative to nominal exchange rate appreciation, but with very different impacts on the price system.

In the third scenario, we introduce the DBCFT/BTA as a 20 percent tax on imports and a 20 percent subsidy to exports, with no tax pass-through on domestic sales, following Auerbach. As in the other scenarios, the price of domestic sales relative to export sales increases by 20 percent. The DBCFT is trade neutral (column 3), and there is virtually no impact on domestic prices, as the nominal exchange rate appreciates by 17 percent.

If prices are fully able to adjust, then, the DBCFT is trade neutral—but with exchange rate, price, and/or wage changes that are potentially large and disruptive. Adjustment to the new system could well be difficult.

Incomplete Price Transmission or BTA Adjustment

In the second set of scenarios (table 2), we consider an incomplete DBCFT—the 20 percent tax on domestic sales is passed on to markets, but adjustment elsewhere is incomplete. In all three scenarios, the CPI is fixed. In the first scenario (column 1), the implicit BTA tariff is not passed on to markets, a possibility

8. We are developing a larger model of the United States with many more sectors, which can provide a simulation platform for analyzing incidence issues.

9. There are also trade and transport margins, which affect prices differently by sector. We simulated the BTA in a model with no existing distortions; it operates as expected—a 20 percent appreciation.

Table 1 20% DBCFT and full border tax adjustment

Policy shock	Scenario 1	Scenario 2	Scenario 3
Price adjustments			
Tax passed on to domestic price	Yes	Yes	No
Exchange rate	Flexible	Fixed	Flexible
Consumer price index	Fixed	Flexible	Fixed
Price indices, base = 1			
Exchange rate	0.84	1.00	0.83
Consumer price index	1.00	1.19	1.00
Domestic price index	0.83	0.99	1.00
Percent change from base value			
Average wage	-0.08	18.52	2.33
Real exports	-0.17	-0.17	0.66
Real imports	-0.13	-0.13	0.52
Real consumption	-0.01	-0.01	0.00
Balance of trade	-0.00	-0.00	0.00
Ratio to GDP (percent)			
Exports	12.15	12.15	12.25
Imports	-15.58	-15.58	-15.68
Trade deficit	3.43	3.43	3.43

Source: Authors' calculations.

suggested by Buitert (2017). The second scenario (column 2) assumes that the exchange is fixed and the trade balance adjusts, a possibility suggested by Cline (2017) and Freund (2017). The third scenario assumes trade balance adjustment and the BTA operates. In all three imperfect adjustment scenarios, the DBCFT is not trade neutral: Exports and imports change in the new equilibrium.

The first scenario with an asymmetric BTA (no implicit tariff) yields incomplete adjustment in the exchange rate (which appreciates by only 10 percent), changes in producer prices, and changes in international trade (real exports increase by 6.2 percent and real imports increase by 4.8 percent) (column 1). The tax on domestic sales without a corresponding tax on imports operates like an export subsidy. With a fixed trade balance, exports increase and the exchange rate appreciates, partly offsetting the export subsidy, leading to an increase in imports.

The second scenario adds a fixed exchange rate, with adjustment in the balance of trade. It effectively amplifies the export subsidy effect of the first scenario: Real exports expand by 17.1 percent, imports do not change, and the trade deficit narrows. The lower trade deficit leads to a fall in aggregate demand domestically, with aggregate consumption falling by 4.1 percent—a significant reduction in welfare.

The third scenario adds to the second scenario the assumption that the BTA tariff operates, increasing the domestic market price of imports. This scenario adds an implicit import tariff to the export subsidy but does not allow the exchange rate to adjust, compounding the impact on trade. The introduction of the DBCFT in this scenario increases exports (by 17.5 percent) and reduces imports (by 7.29 percent), dramatically reducing the trade deficit and welfare (aggregate consumption falls by 6.5 percent).

The introduction of a DBCFT with incomplete adjustment is not trade neutral: Exports and imports are affected. The resulting system is protectionist, in that imports are taxed and/or exports subsidized.

Table 2 20% DBCFT and imperfect border tax adjustment

Policy shock	Scenario 1	Scenario 2	Scenario 3
Price adjustments			
Tax passed on to domestic prices	Yes	Yes	Yes
BTA tariff operates	No	No	Yes
Exchange rate	Flexible	Fixed	Fixed
Balance of trade	Fixed	Flexible	Flexible
Consumer price index	Fixed	Fixed	Fixed
Price indices, base = 1			
Exchange rate	0.90	1.00	1.00
Consumer price index	1.00	1.00	1.00
Domestic price index	0.83	0.83	0.83
Percent change from base value			
Average wage	2.76	1.92	-1.88
Real exports	6.21	17.12	17.52
Real imports	4.84	0.08	-7.29
Real consumption	-0.09	-4.11	-6.54
Balance of trade	-0.00	-60.41	-95.33
Ratio to GDP (percent)			
Exports	12.93	14.28	14.35
Imports	-16.36	-15.64	-14.51
Trade deficit	3.43	1.36	0.16

Source: Authors' calculations.

CONCLUSIONS

Our CGE simulation model of the United States incorporates different ways the new DBCFT might operate. We find that:

- The required appreciation of the nominal exchange rate to achieve trade neutrality in a DBCFT system with full adjustment, assuming no change in the CPI, is very large, with potential disruptive impacts beyond product and labor markets (e.g., in asset markets).
- Achieving trade neutrality in a scenario with a fixed exchange rate involves major and potentially disruptive shocks to domestic prices and wages.
- Incomplete adjustment, through failure of the BTA implicit tariff to operate and/or induced changes in the trade balance, yield uneven trade impacts, with implicit tariff protection and export subsidies. These results are likely to raise concerns with trading partners and may lead to disputes under international trade agreements.
- Incomplete adjustment scenarios with a fixed exchange rate and adjustment of the trade balance result in subsidizing exports and/or taxing imports. Aggregate consumption falls, and there is a significant impact on trade flows.

The DBCFT is a new, untried approach to business tax reform. Analyzing its impact is difficult, because there are no examples to study. Unlike a VAT, the tax is intended to be implemented at the level of businesses; its impact on markets will depend on whether and how businesses pass the tax on to goods markets.

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