

# How much thicker is the Canada–U.S. border? The cost of crossing the border by truck in the pre- and post-9/11 eras



W. Mark Brown

*Economic Analysis Division, Statistics Canada, R.H. Coats Building, 100 Tunney's Pasture Driveway, Ottawa, Ontario K1A 0T6, Canada*

## ARTICLE INFO

### Article history:

Received 30 September 2014  
Received in revised form 30 June 2015  
Accepted 5 July 2015  
Available online 28 August 2015

### Keywords:

Border costs  
International trade

## ABSTRACT

In the aftermath of 9/11, a new security regime was imposed on Canada–U.S. truck-borne trade, raising the question of whether the border has ‘thickened.’ That is, did the cost of moving goods across the border by truck rise and, if so, by how much, and have these additional costs persisted through time? Building on previous work that measured the premium paid by shippers to move goods across the Canada–U.S. border by truck, from the mid- to late 2000s, this paper extends the time series back to 1994, encompassing the pre- and post-9/11 eras. The analysis shows that the premium paid to move goods across the border rose, from 0.3% of the value of goods shipped prior to 9/11, to about 0.6% after 9/11, with these higher costs persisting through to the late 2000s. Whether these additional costs are imposed on the export or import leg of the cross-border journey depends on the balance of cross-border trips, with the export leg bearing these costs until about 2005, and increasingly the import leg thereafter.

Crown Copyright © 2015 Published by Elsevier Ltd. All rights reserved.

## 1. Introduction

After 9/11, a new security regime was imposed on the movement of goods across the Canada–U.S. border, which led many to ask whether the border has ‘thickened.’ That is, did the cost of moving goods across the border rise, and, if so, by how much? The purpose of this paper is to assess the additional cost of moving goods across the border by truck in the pre- and post-9/11 eras. Trucks are the primary mode by which goods cross the border, transporting half of the dollar value of exports to the United States and just over two-thirds of imports.<sup>1</sup> This paper builds on previous work (Anderson & Brown, 2012; Brown & Anderson, 2015) that measured the premium paid by shippers to move goods across the Canada–U.S. border by truck, from the mid- to late 2000s by extending the time series back to 1994, encompassing the pre- and post-9/11 periods.

The costs of crossing the border can be divided into three basic types: formal tariff barriers, non-tariff barriers, and the cost of the transport system itself. The latter is the focus of this paper—in particular, the

border-related costs incurred by trucking firms that are passed on to their customers through higher prices.<sup>2</sup> These costs may stem from increased wait times or their changeability, and from the cost of complying with additional border regulations often aimed at speeding passage across the border (e.g., implementation of a series of security protocols required for participation in trusted-trader programmes).

To date, considerable work has been undertaken to examine whether the post-9/11 security regime has had a detrimental effect on Canada–U.S. trade (see Burt, 2009; Globerman & Storer, 2008, 2009; Grady, 2008). These studies assess the impact of the new security regime by observing the volume of trade prior to and after 9/11 using standard gravity-style trade models. An unaccounted for drop in the volume of trade is seen as evidence that border thickening resulted in higher delivered prices and a concomitant drop in the quantity of exports demanded in the United States. The evidence from these models is mixed, with Globerman and Storer (2008 and 2009) and Grady (2008) finding evidence of a drop in the volume of trade, while Burt (2009) finds little evidence of this effect.

*E-mail address:* [mark.brown@statcan.gc.ca](mailto:mark.brown@statcan.gc.ca).

<sup>1</sup> In 2009, goods shipped by truck accounted for 47% of the value of Canada’s merchandise exports to the United States and 70% of the value of imports from the United States. Consequently, trucking costs may affect the overall degree of integration between the two markets. U.S. Department of Transportation, Research and Innovation Technology Administration, Bureau of Transportation Statistics, North American Transborder Freight Data (2011). [http://www.bts.gov/programs/international/transborder/TBDR\\_QA.html](http://www.bts.gov/programs/international/transborder/TBDR_QA.html) (accessed May 10, 2011).

<sup>2</sup> Non-tariff barriers include those that are policy-driven (for example, regulatory differences that increase the cost of trade) and those that are related to a broad set of factors that affect transaction costs. These are thought to stem from the presence of common institutions, norms, and tastes within national boundaries (Helliwell, 1998, 2005). Helliwell (1998, 123) notes, “as long as national institutions, populations, trust, and tastes differ as much as they do, the industrial organization and other institutional literatures would predict that transaction costs will remain much lower within than among national economies, even in the absence of any border taxes or regulations affecting the movement of goods and services.”

While the costs borne by carriers in the wake of 9/11 may be reflected in prices, so too will other factors that influence the Canada–U.S. trading relationship in the 2000s. One of the most important factors is the balance of Canada–U.S. truck-borne trade, which determines which leg of the cross-border round trip constitutes the ‘backhaul.’ Carriers, when they take a contract,

“...must commit to the maximum transport capacity required for a round trip and, therefore, face a logistics problem: there is an opportunity cost associated with returning empty (‘backhaul problem’), and that opportunity cost depends on the shipping direction” (Behrens & Picard, 2011, 281).

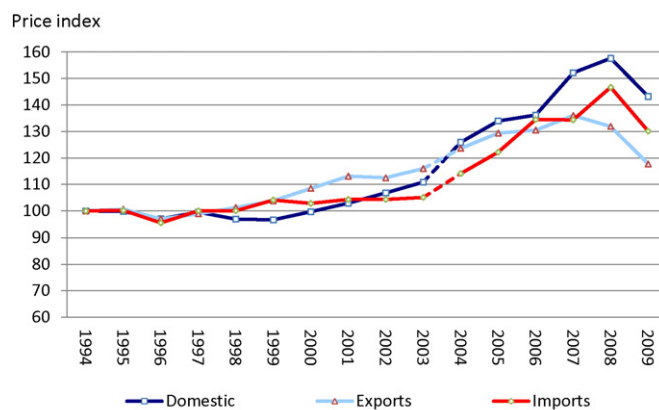
The backhaul problem is well known (see Felton, 1981; Jonkeren, Demirel, van Ommeren, & Rietveld, 2011). If the truck is empty on the return trip, the opportunity cost of that leg is zero (Behrens & Picard, 2011). Hence, the carrier will have an incentive to undercut other carriers on that leg, putting downward pressure on prices. Of course, the opposite occurs for the leg with a high level of demand. Prices on the leg with low demand (the ‘backhaul’) and on the leg with high demand (the ‘fronthaul’) can differ greatly. For instance, reflecting the large imbalance in U.S.–China trade, in 2005, it cost \$1400 to ship a container from China to the United States, but only \$400 to \$500 for the return journey (Behrens & Picard, 2011).

Through the study period, the relative demand for trucking goods to and from the United States shifted. During the 1990s, the implementation of the Canada–United States Free Trade Agreement and the North American Free Trade Agreement brought about expanded trade with the United States, with a rising share of manufacturing output exported across the border (Baldwin & Yan, 2012). With the balance of trade favouring Canada during this period, export trips were likely the fronthaul and import trips the backhaul. In the 2000s “...the worldwide resource boom...led to higher prices for Canadian commodities, an increase in the Canada–U.S. exchange rate, [and] a decline in the competitiveness of the Canadian manufacturing sector in U.S. markets” (Baldwin & Yan, 2012, 7). For a cross-border round trip, the fronthaul may have switched from the journey to the United States to the journey home.<sup>3</sup> The obvious implication is that during a period when there should be upward pressure on the price of shipping goods to the United States, because of the new security regime, there was also downward pressure on prices because of changes in the relative demand for the two legs of the U.S. round trip.

Disentangling these effects cannot be accomplished through aggregate trucking price indices, because they reflect the net of these countervailing effects through the 2000s. Required is an econometric analysis of the prices charged by motor carriers at the micro-level, which permits the breakdown of the effect of fixed and variable (line-haul) costs on these prices. Assuming that border compliance costs are reflected in the fixed cost of cross-border movements and that changes to the ‘fronthaul/backhaul’ portions of the journey are reflected in line-haul costs, these two effects can be identified separately.

Statistics Canada’s Trucking Commodity Origin and Destination (TCOD) Survey is used to assess the impact of these effects. It samples waybills of for-hire trucking firms to measure the characteristics of their shipments (for example, revenue, weight, distance shipped and commodity type) for domestic and cross-border shipments, primarily to the United States. The TCOD Survey provides a means to measure trucking costs—that is, the cost to shippers of moving their goods between an origin and destination.

This paper uses a dataset that, while having much in common with the one used by Anderson and Brown (2012), is qualitatively different in several fundamental respects. First, and most obvious, the dataset was extended back to 1994. This was complicated by the redesign of



Source: Brown and Zhu (2012)

Fig. 1. Trucking price index by trade type, with sample adjustment.

the TCOD Survey between 2003 and 2004, which meant that care had to be taken to ensure the consistency of the time series over the period and the robustness of the econometric estimates to changes to the survey design. Second, since the TCOD Survey does not measure the value of goods shipped, they had to be estimated by multiplying the tonnage shipped by the value per tonne on a commodity basis. Previously this was done by using a relatively aggregate set of commodities, but recently a set of much more fine-grained commodity value per tonne estimates became available and these were used instead. Finally, the database was rebuilt on a quarterly, rather than an annual basis, to better capture the key time signature of events that might affect the price of goods shipped across the border.

The next section (Data development) describes the methods used to develop a comprehensive measure of trucking costs. This entails a more detailed description of the TCOD Survey dataset and the steps taken to ensure the comparability of these survey data through the study period. The next section (Econometric model) presents a multivariate analysis that takes into account potential differences between cross-border and domestic shipments to arrive at an estimate of their relative costs. This is followed by the presentation of ad valorem estimates of trucking costs (ad valorem trucking costs) and, in particular, the ad valorem tariff equivalent of shipping goods across the border, which is used to measure the degree and persistence of border thickening. The last section provides a brief conclusion, summarizes the results of the analysis and outlines some caveats in interpreting the data.

## 2. Data development

### 2.1. Trucking commodity origin and destination survey

The Trucking Commodity Origin and Destination (TCOD) Survey measures: (1) the output of the for-hire trucking sector and (2) the volume of commodities moved by truck (Gagnon and Trépanier, n.d.). As noted above, the survey measures, on a shipment basis, tonnes shipped, the distance shipped, the origin–destination and the revenue earned by the carrier. The revenue earned by the carrier from each shipment reported by the TCOD Survey is used here to assess the relative costs of domestic and cross-border transportation. The question arises as to whether the revenue from a specific shipment is a good proxy for the total cost of transportation. This might not be true if carriers do not pass the full cost of crossing the border onto shippers. However, this would imply that carriers accept lower profit margins for cross-border shipments than for domestic shipments, which seems unlikely.

The survey underwent a major revision in 2004 resulting in three significant changes to its methodology (see Gagnon and Trépanier, n.d.). First, it moved from a two-stage to a four-stage sampling routine, which affects the weights used on the file. In unpublished work

<sup>3</sup> A contributing factor to a switch may have been the implementation of the security regime itself to the extent that it tended to discourage exports to the U.S.

Download English Version:

<https://daneshyari.com/en/article/998685>

Download Persian Version:

<https://daneshyari.com/article/998685>

[Daneshyari.com](https://daneshyari.com)