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The Impacts of 9/11 on Canada - U.S. Trade

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The Impacts of 9/11 on Canada-U.S. Trade*

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* This report summarizes the results of a statistical analysis of the impact of 9/11 on Canada-U.S. trade. The full version of the study is available from the authors on request.

About the Border Policy Research Institute

The BPRI focuses on research that informs policy-makers on matters related to the Canada—U.S. border. Policy areas of importance include transportation and mobility, security, immigration, energy, environment, economics, and trade.

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INTRODUCTION

The 9/11 terrorist attacks in New York and Washington have had profound global economic and political effects. One consequence of the tragedy is heightened security concerns surrounding the movement of goods and people across international borders that, in turn, have raised the prospects of substantial disruptions of international trade. Within the Canada-U.S. context, numerous observers have identified increased regulations and intensified inspection procedures at the Canada-U.S. border as contributing to significantly higher shipping costs and shipment delays. The higher costs and associated disruptions to commercial shipments might be inferred to discourage growth of trade between the two countries. It is now widely accepted that economic integration between the Canadian and U.S. economies is, on balance, an important contributor to the economic health of both economies, especially Canada's. Developments that might attenuate the growth and "deepening" of North American economic integration therefore threaten the economic welfare of Canadians and Americans, and their nature and magnitude are worthy of careful analysis.

Clearly, national security has become a much more pressing policy goal in the two countries post 9-11. Nevertheless, policymakers need to be aware of the costs of initiatives to promote increased security in order to balance the benefits and costs of specific initiatives, and eliminate (or modify) those whose costs outweigh their benefits in terms of improved security. Moreover, the relevant costs might be capable of being reduced without unduly compromising security through a reallocation of resources across government programs, as well as within the operations of specific agencies. In short, a greater understanding of how post-9/11 security-related developments are affecting economic circumstances can help im-

prove policymaking in this area.

The main purpose of this study is to identify the impacts of post-9/11 security developments on bilateral trade between Canada and the United States. Specifically, the study provides a statistical analysis of the extent to which bilateral trade flows fall short of their "expected" levels in the post-9/11 period. It provides estimates of trade shortfalls for both U.S. exports to Canada and U.S. imports from Canada on an aggregate level, as well as separately for the largest U.S. land ports. One key finding of the study is that both U.S. exports to and imports from Canada were lower than they would otherwise have been in the post-9/11 period given traditional determinants of bilateral

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trade. These export and import “shortfalls” decreased in relative magnitude after 2003; however, whereas the shortfall for U.S. exports to Canada had effectively disappeared by the middle of 2005, a significant shortfall for U.S. imports from Canada continued to persist through mid-2005. This finding supports a view expressed by some observers that Canadian exporters have been relatively disadvantaged compared to U.S. exporters by post-9/11 security-related developments.

Another empirical finding is that trade shortfalls are not uniform across land ports at the Canada-U.S. border. Indeed, significant differences can be identified across ports in the extent of the identified trade shortfalls. For example, whereas statistically significant shortfalls in U.S. imports from Canada can be identified for the ports of Blaine, Champlain / Rouses Point and Port Huron through mid-2005, the shortfalls identified in the immediate aftermath of 9/11 had essentially disappeared for the ports of Buffalo and Detroit by 2003. Further analysis suggests that differences across ports are not obviously linked to differences in the mix of commodities processed through the individual ports. A more plausible explanation appears to be the mix of transport modes serving the ports. Specifically, ports that are more intensive users of rail as a transport mode are more likely to evidence a persistent import shortfall.

The study proceeds as follows. Initially, an overview of the growth and commodity composition of bilateral trade is presented by way of background. This is followed by an evaluation and synthesis of various studies that provide mostly indirect insights into the impacts of post-9/11 security developments on bilateral trade. We then set out our own statistical methodology for identifying the impacts of 9/11 on bilateral trade flows and present quantitative estimates of the impacts for both overall U.S. export and import trade with Canada, as well as for exports and imports crossing through major land ports. The conclusions from the statistical analysis are evaluated against the background of more qualitative evidence, including small case studies of the main trading industries. The study concludes with a set of policy conclusions and recommendations.

OVERVIEW OF CANADA-U.S. TRADE

Canada-U.S. trade constitutes the largest bilateral trade relationship in the world. Moreover, levels of historical bilateral trade flows understate the importance of a smoothly functioning border between the two countries, since much of the production that takes place in each country relies upon just-in-time supply of inputs shipped across the border.

Notwithstanding the large absolute volume of bilateral trade, the industrial composition of traded goods is fairly concentrated. Looking at the value of U.S. imports from Canada, the 15 largest importing industries in 2004 accounted for around 55% of total Canadian exports to the United States in that year. Motor vehicles alone accounted for over 16% of the value of total U.S.-bound Canadian exports. Total exports of five segments of the broader transportation equipment sector account for approximately 22% of the value of U.S. merchandise imports from Canada. Other major Canadian export industries include energy (oil and gas and petroleum products) and forest products (wood and paper products).

The industrial composition of U.S. exports to Canada is less concentrated than the industrial composition of U.S. imports from Canada. Nevertheless, transportation equipment exports to Canada are quite important for the United States. Specifically, motor vehicles account for slightly more than 9% of all U.S. merchandise exports to Canada in 2004. Six transportation equipment-related sectors collectively account for almost 25% of U.S. exports to Canada.

For the most part, the composition of the leading export and import sectors remained fairly constant over the 1990s and the early 2000s. The implication is that significant post-9/11 impacts on bi-

lateral trade should be observable with reference to a relatively small number of industries.

It should also be noted that bilateral trade is concentrated in a relatively small number of ports. Specifically, of the estimated 75 land ports along the Canada-U.S. border, just three account for the bulk of bilateral trade. Two are at the border between Michigan and Ontario (Detroit and Port Huron) and one is at the border between New York and Ontario (Buffalo-Niagara Falls). The concentration of commercial shipments at the Michigan ports is to be expected given the prominence of transportation equipment in overall bilateral trade. Furthermore, most non-motor vehicle manufactured goods produced in Canada originate in Ontario and Quebec and also cross into the United States at entry points in Michigan and New York.

The overwhelming bulk of merchandise shipped between Canada and the United States employs surface modes of transportation, essentially truck and rail. In 2002, around 61% (by value) of U.S. imports from Canada was shipped by truck and an additional 24% was shipped by rail. For U.S. exports to Canada, approximately 78% was shipped by truck and 9% by rail.

PREVIOUS RESEARCH

A wide range of explicit and implicit incremental costs has been associated

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with border security procedures implemented since 9/11. One approach to identifying those costs involves estimation of the changes in waiting times and the variability of waiting times post-9/11. A second approach involves estimates of the incremental costs to shippers associated with longer and more variable wait times at the border. A third utilizes evidence on the reaction of shippers to post-9/11 developments. In particular, have shippers been willing to incur specific costs in order to mitigate border delays and uncertainties, and what are the magnitudes of the costs that have been willingly incurred? A fourth approach evaluates whether, and to what extent, commercial and private vehicle border crossings have changed over time. No available study, to our knowledge, attempts to estimate directly the impact of post-9/11 border security developments on bilateral trade flows.

The available body of evidence suggests that significant additional costs and delays were imposed on shippers in the immediate aftermath of 9/11. Efforts made by the two governments to mitigate the impacts of the disruptions, in particular the dispatching of the National Guard to border crossings, apparently mitigated some of the adverse impacts and facilitated reductions in average wait times; however, it appears that delays and timing uncertainties associated with border crossings remain

greater problems than they were prior to 9/11. Moreover, the delays and uncertainties regarding crossing times impose significant costs on shippers. Nonetheless, there is little evidence of shippers initiating changes in mode shipment choice or border crossing times and locations in response to the border crossing disruptions identified. Nor is there strong evidence that the number of trucks crossing the border has declined relative to the growth of overall economic activity. In light of the fairly limited and mixed evidence regarding the impact of added costs on trade flows, additional empirical evidence on the issue seems useful. To our knowledge, our study is the first that links bilateral trade flows to 9/11.

METHODOLOGY

The methodology followed by the study involves the specification and estimation of U.S. export and import equations. The particular specification chosen is derived from the gravity model of trade. This well-established model is built around the notion that trade between any two countries should grow as the size of each trading partner increases. Conversely, the greater the physical distance between any two countries, the greater should be the transportation costs and, therefore, the smaller the volume of trade. This basic gravity model is usually augmented by incorporating

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other independent variables into the export and import equations, particularly relevant exchange rate relationships.

Since the basic focus of the investigation is on changes in bilateral trade flows over time, the specification of the benchmark gravity model focuses on the main determinants of U.S. imports from and exports to Canada over time. For the import equation, the dependent variable is the nominal (U.S.) dollar value of U.S. imports from Canada. One independent variable is nominal (U.S.) dollar value of the U.S. GDP. A second independent variable is the Canada-U.S. exchange rate specified as the number of Canadian dollars per U.S. dollar. Since our observations are quarterly over the period 1996 (Quarter 1) through 2005 (Quarter 2) for U.S. imports, we also include dummy variables for the second, third and fourth quarters of each year.¹ For the export equation, the dependent variable is the nominal (U.S.) dollar value of U.S. exports to Canada. The measure of economic activity is the U.S. dollar value of Canada's GDP. All other independent variables are specified as in the U.S. import equation.

The time-sensitive variable of most direct relevance to this study is the magnitude of the explicit and implicit costs associated with security-related developments. Since no such time series is available, we must rely upon indirect approaches to identifying changes in the magnitude of these costs over time.

The general approach chosen is to assume that the costs differ between the pre and post-9/11 period. One specification incorporating this assumption would involve the use of a single dummy independent variable that takes a value of zero for all quarters prior to the third quarter of 2001 and a value of unity for all other quarters. This specification would effectively incorporate the assumption that the costs of border security-related procedures increased "once-and-for-all" after 9/11. While this assumption cannot be ruled out automatically, it seems unlikely in light of comments made by managers and government officials involved in bilateral trade. Specifically, it seems more likely that, while costs did increase substantially after 9/11, there were periods of time when the relevant costs decreased as well as increased.

In the absence of reliable information about the time series behavior of security-related costs to shippers and producers involved in bilateral trade, it seems advisable to employ a general specification that identifies a separate time period dummy variable for each quarterly observation commencing with the third quarter of 2001. For example, one independent variable would take a value of unity for 2001 Quarter 3 and zero for all other time periods. A second independent variable would take a value of unity for 2001 Quarter 4 and zero for all other time periods, and so forth. This

¹Missing data limited our time series for U.S. exports to Canada to the period 1997 Quarter 1 through 2005 Quarter 2.

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flexible specification allows the impact of time on the dependent variable to vary between time periods post 9/11. This approach seems more appropriate than “forcing” specific time patterns on the data in the absence of strong theoretical reasons for assuming one or another more specific pattern.

Several other issues are relevant in specifying the export and import equations. One is whether the independent variables should be specified as contemporary or entered with a lag structure. It is reasonable to expect that changes in overall economic activity and the exchange rate will influence exports and imports with a lag, and other research suggests that the lags can be as long as six quarters. Again, rather than imposing an a priori lag structure, alternative lags for the GDP and exchange rate variables are specified, and a selection is made based upon which lag provides the best statistical results. A second specification issue is whether the dependent variable and one or more independent variables should be specified as linear or log-linear terms. Both theoretical considerations, as well as empirical results, support the inclusion of the dependent variables and the GDP variables in log form.

DATA SOURCES AND STATISTICAL RESULTS

The source of data for the trade flows

is the Foreign Trade Division of the U.S. Bureau of the Census. The Bureau’s unpublished database identifies exports and imports for every U.S. port of entry with commodity detail provided at the 5-digit SITC level. Data for the independent variables were obtained from Statistics Canada (Canadian GDP), the U.S. Bureau of Economic Analysis (U.S. GDP) and the Federal Reserve (Canada-U.S. exchange rate).

In the initial estimated model, the import and export equations are estimated over the period 1996 Q1 through 2001 Quarter 2. The goal was to identify an economically and statistically reliable model to serve as a “benchmark” specification to which the time series variables would be added for samples that include data from after the second quarter of 2001. The parsimonious U.S. import equation performs quite well. In this model, the natural log value of U.S. imports from Canada is a function of the natural log value of U.S. GDP, the Canada-U.S. exchange rate, the seasonal dummy variables, and a set of port dummy variables that identify the 10 largest U.S. ports through which Canadian imports pass. The estimation results for the U.S. export equation are not as satisfactory as for the import equation. In particular, the exchange rate coefficient often takes the “wrong” sign. Nevertheless, the overall goodness of fit of the export equation is quite good and seems acceptable to use as a benchmark

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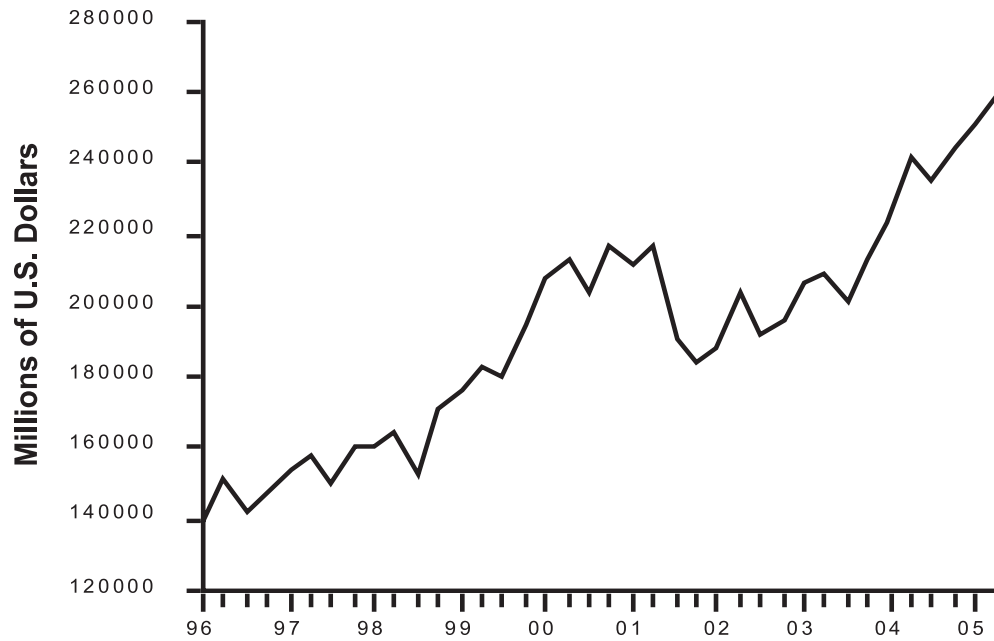


Figure 1: Aggregate U.S. Imports from Canada (annualized)

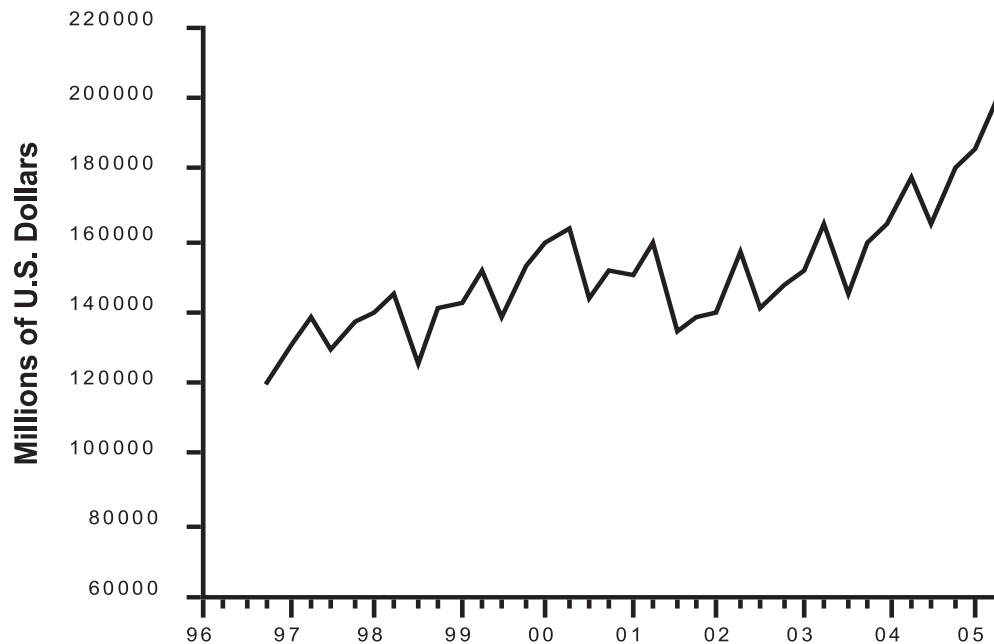


Figure 2: Aggregate U.S. Exports to Canada (annualized)

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model to which the time series variables can be added.

The preferred specifications of the import and export equations estimated over the period through 2001 Quarter 2 were then re-estimated over the full sample period adding the quarterly time dummy variables described earlier. The goal was to identify whether the time series variables are statistically significant and, if so, the size of their effects. A significant post-9/11 impact is suggested by time series plots shown in Figures 1 and 2. Specifically, the data summarized in these charts show a downward movement in both imports and exports between 2001 and 2002, although the movement is more evident in the case of U.S. imports from Canada.

When the time dummy variables are included in the import equation and the equation is estimated over the full time period through 2005 Quarter 2, the most salient result is the negative pattern of coefficients for the dummy variables. Specifically, all of the coefficients for the time dummy variables are negative and statistically significant. This result indicates that U.S. imports from Canada in the post-9/11 period were below levels that could have been expected holding constant macroeconomic determinants of trade, as well as seasonal influences on trade. The import "shortfall" for each time period following 9/11 is summarized in Table 1. The estimated percentage shortfalls in each period shown

are the estimated coefficients for the time dummy variables for each period. The peak shortfall for U.S. imports from Canada was 2003, when U.S. imports were almost 26% below the level that would have been expected based upon pre-9/11 experience. By the first half of 2005, U.S. imports from Canada were around 12% lower than what would be expected from the experience over the period 1996 Quarter 1 through 2002 Quarter 2. This result implies that total imports from Canada were almost U.S. \$12 billion less than they would otherwise have been through the first half of 2005. While we cannot with certainty ascribe this result entirely to 9/11, we did make an effort to rule out other obvious causes of this trade shortfall.

In a manner similar to aggregate imports from Canada, the coefficients for the time dummy variables were estimated for U.S. exports to Canada over the full sample period. The estimated pattern of coefficients for the time dummy variables indicates that the negative impact of post-9/11 developments on U.S. exports to Canada increased between 2001 Quarters 3 and 4 and then decreased consistently, at least for several versions of the model. In other versions of the model, there was a very modest increase in 2003 followed by a consistent decrease. As Table 2 shows, this early pattern for 9/11 impacts on exports is similar to that estimated for imports. One apparent difference between the

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Table 1: Estimated Import Shortfalls Following 9/11

Time Period	Percentage Shortfall	Dollar Amount Shortfall (U.S. Dollars)
2001 Quarter 3	8.6%	\$5.2 Billion
2001 Quarter 4	21.4%	\$10.8 Billion
2002	19.4%	\$10.3 Billion
2003	25.8%	\$13.7 Billion
2004	17.5%	\$10.4 Billion
2005 (first 2 quarters)	12.2%	\$11.4 Billion

Table 2: Estimated Export Shortfalls Following 9/11

Time Period	Percentage Shortfall	Dollar Amount Shortfall (U.S. Dollars)
2001 Quarter 3	18.0%	\$5.5 Billion
2001 Quarter 4	22.8%	\$8.2 Billion
2002	19.8%	\$6.8 Billion
2003	15.8%	\$7.3 Billion
2004	3.9%	\$1.4 Billion
2005 (first 2 quarters)	(5.8% increase)	(\$2.5 Billion increase)

import and export equations is that the estimated coefficients for the years 2004 and 2005 are statistically insignificant in the U.S. export equations, thereby suggesting that border congestion effects had apparently “disappeared” for northbound commercial shipments by the end of 2003. In contrast, statistically significant negative impacts on U.S. imports from Canada persisted through

the 2005 period.

Besides estimating the impacts of 9/11 on overall imports and exports, we estimated similar models for the ten largest U.S. land ports for trade with Canada. Graphing the data for imports and exports at the individual port level suggests that the experiences of the individual ports are not identical (see Figure 3). Our regression analysis revealed

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that, for imports from Canada, the overall pattern of the estimated time period variables is fairly similar across the different ports, with the notable exceptions of Detroit and Buffalo/Niagara Falls. Specifically, the smallest impact was typically experienced in Quarter 3 of 2001. The impact increased in Quarter 4 of 2001 and then remained fairly constant until either 2003 or 2004 when the negative impact on trade was most pronounced for six of the ten top ports.²

While the pattern of the coefficients for the time dummy variables is similar across ports in the import equations, there are also clear differences across ports in the magnitudes of the estimated coefficients for the individual time dummy variables. For example, in 2005, imports from Canada through the port of Detroit were actually higher than “predicted” by the import equation. At the other extreme, the Ports of Champlain/Rouses Point and Port Huron were characterized by relatively large import shortfalls based on the regression analysis. In the cases of these latter two ports, imports in the first half of 2005 were on the order of 25% below the levels that would be expected based upon the pre-9/11 experiences. Import shortfalls of around 20% are identifiable for the ports of Alexandria Bay, Portal and Sweetgrass. In the case of Blaine, an import shortfall of around 13% is estimated. Conversely, no statistically

significant negative impact on imports from Canada can be identified for Highgate Springs, Buffalo/Niagara Falls and Pembina. In sum, whereas all of the sample ports experienced a substantial and statistically significant import shortfall at some point in the post-9/11 period, only about half of the largest ports were still experiencing a significant negative shortfall by the end of the first half of 2005.

The U.S. export equation for the full time period was then estimated for each of the ten largest ports in a similar manner to the import equation estimation. Much greater variation in the pattern of estimated coefficients for the time dummy variables was observed in the case of the individual port export equations than in the comparable import equations. For example, for some ports, the negative impacts of post 9/11 developments decrease between 2003 and 2005, whereas for others they increase. Differences across ports with respect to the estimated coefficients for individual time periods are substantial. For example, statistically significant export shortfalls are identified for the ports of Sweetwater, Alexandria Bay and Champlain/Rouses Point, but not for Highgate Springs, Buffalo/Niagara Falls, Blaine, Portal, Detroit and Port Huron.

In summary, significant differences appear to exist across ports with respect to the estimated trade shortfalls in the post-9/11 period. This finding hints at

²Highgate Springs, Sweetgrass and Blaine are ports exhibiting larger negative impacts on imports in 2005 than in 2004.

a potentially important policy inference. Namely, efforts to ease border disruptions associated with security-related procedures may be more efficiently undertaken by focusing them on the individual large ports exhibiting the greatest lingering trade shortfalls. We shall shortly discuss our efforts to identify the reason(s) for the different port experiences.

INTERPRETING THE RESULTS

While shortfalls in U.S. exports to Canada are estimated to have essentially disappeared by mid-2005, import shortfalls have apparently persisted. Moreover, the estimated import shortfalls are large, both in the aggregate as well as for specific individual border crossings. Indeed, our results point to more substantial adverse impacts on U.S. imports from Canada than have been suggested by other studies, to date. It is therefore appropriate to consider whether other phenomena may have adversely affected U.S. imports from Canada in the post-9/11 period that may not be captured effectively in our statistical model.

An evaluation of this possibility involved focusing on the trade sectors that are particularly important quantitatively in the bilateral context with the following question in mind: were there any developments unrelated to border security that might have contributed to the post-9/11 Canadian import shortfall

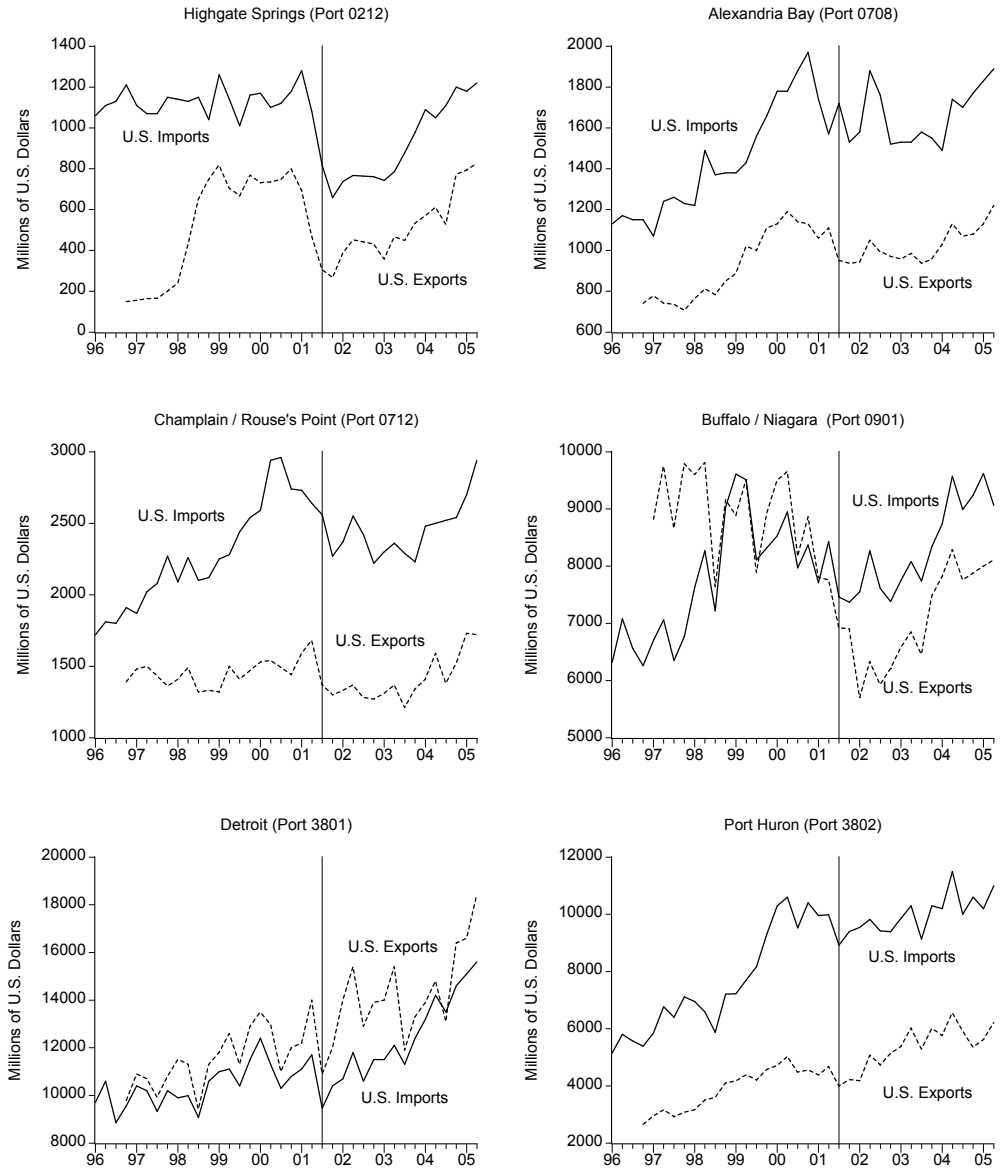
identified by our statistical model? The most prominent sector in this regard is transportation equipment. A concern here is that offshore sourcing of parts and assembled vehicles displaced North American production, particularly production in Canada, thereby contributing to reduced bilateral trade in the post-9/11 period; however, the evidence suggests that the competitive challenge from foreign producers was manifested not so much in terms of increased imports from outside North America, but rather in increased sales from foreign-owned plants, particularly Japanese-owned plants, within North America. Furthermore, available information does not support a claim that Canadian automotive sector producers were less efficient than their U.S. counterparts such that more production would take place in the United States, thereby displacing imports from Canada. Rather, the opposite seems to be true, i.e., producers in Canada enjoyed a significant productivity advantage over their U.S.-based counterparts.

Another prominent trade sector is oil, gas and petroleum products. Oil and gas are primarily transported by pipeline, and it is, therefore, extremely unlikely that any decline in Canadian exports of these products could be attributable to border security-related developments. On the other hand, tanker trucks are an important mode of transport for petroleum products and, therefore, might be

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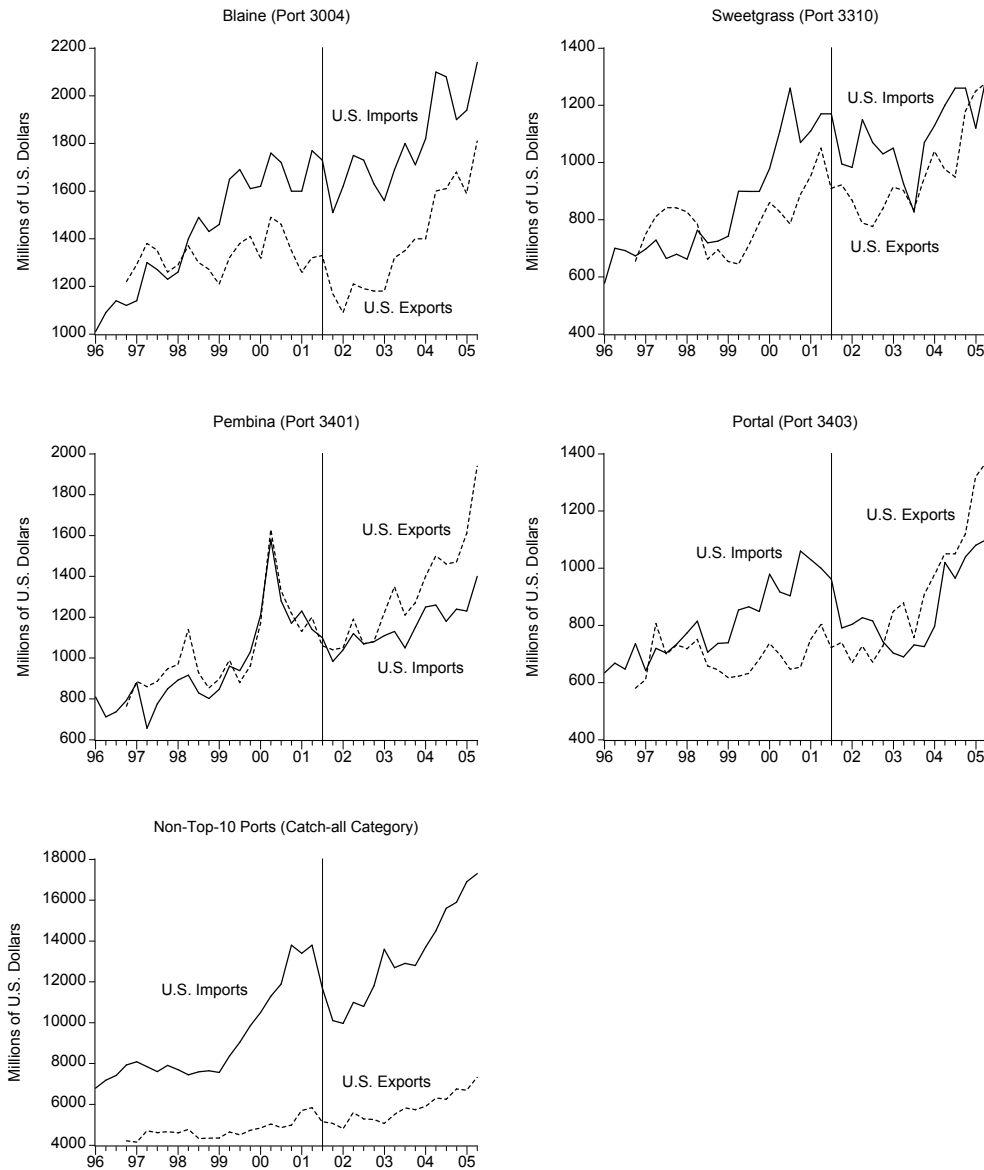
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Figure 3: Imports and Exports by Port (in millions of US \$)



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Figure 3 (Cont.)



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adversely impacted by border crossing disruptions. In the context of bilateral energy trade, a significant reduction in the price of petroleum products might lead to a measured decrease in Canadian exports of petroleum products unrelated to post-9/11 developments. However, after declining slightly in 2001 and early 2002, an index of petroleum product prices increased consistently from late 2002 through 2005, thereby mitigating the potential relevance of energy price reductions as a cause of the import shortfall from Canada. In addition, there is no basis for arguing that U.S.-based importers substituted petroleum product imports from outside North America for imports from Canada.

As in the case of petroleum products, the value of bilateral trade in metals and metal products might be affected either by changes in the average prices of those products or because shipments of those products from outside North America displace bilateral trade. Again, these possibilities do not appear relevant. Specifically, price indices for base metals, after decreasing in 2001 and early 2002, subsequently increased. Indeed, the increases in 2003 and 2004 were quite substantial ranging from a low of 20% for aluminum to a high of 72% for lead. These data suggest that decreases in metal prices cannot plausibly contribute to the estimated Canadian import shortfall in the post-2002 period.

Finally, we considered the potential

for forest products exports from Canada to the U.S. to be seriously disrupted in the post-9/11 period by the dispute surrounding softwood lumber exports from Canada. The Softwood Lumber Agreement expired in March 2001 and was followed by a significant increase in shipments of softwood lumber for Canada to the United States. The U.S. Department of Commerce levied a preliminary countervailing duty against lumber imports from Canada in August 2001 followed by an anti-dumping duty. These duties remained in place (at different values) over the post-2001 period. It must be acknowledged that the duties imposed by the U.S. government may have kept physical volumes of Canadian lumber below what they otherwise would have been in the post-9/11 period. In this regard, however, it might be noted that the absolute volume of Canadian softwood lumber exports to the United States actually increased in 2003 and 2004 reflecting strong U.S. housing construction activity. Moreover, Canada's share of the U.S. softwood lumber market was relatively stable from 2002-2004. In any case, a decrease in softwood lumber exports is unlikely to have contributed substantially to the estimated shortfall in U.S. imports from Canada, since less than three percent of Canada's total commodity exports to the U.S. are comprised of softwood lumber.

In summary, an assessment of possible post-9/11 developments affecting

major bilateral trading sectors, particularly from the perspective of Canadian exports to the United States, does not provide strong grounds for concern that we have unwittingly overlooked factors contributing to estimated trade shortfalls while ascribing the consequences of those factors to increased border security and its associated costs. Furthermore, while we are unable to offer any definitive explanations of the observed differences across ports in estimated trade shortfalls, our analysis rejects the notion that the differences are primarily a consequence of differences in the commodity compositions of shipments passing through individual ports. Rather, differences in trade shortfalls at the port level more likely reflect differences in conditions surrounding the infrastructures of the ports, as well as in procedures followed at the various ports.

POLICY CONCLUSIONS

Two broad approaches towards addressing the simultaneous need for border security and the relatively free flow of commercial shipments have been identified. One encompasses the bilateral harmonization of border security policies along with a pooling of sovereignty to build a formal North American security perimeter. A second, less ambitious approach, involves a mixture of enhanced cross-border security coordination and collaboration with partial

and uneven policy convergence.

The first approach is envisaged to involve the implementation of a border security perimeter in which commercial shipments and travelers entering the North American “space” would face security screening at the point of entry. Once cleared to enter, shippers and other travelers could cross the Canada-U.S. border presumably without the need for additional security evaluation. A model of a common external perimeter is the European Union’s Schengen Agreement. This agreement includes common visa and asylum policies, a shared information system and standardized border procedures. Adoption of a Schengen-type approach to creating a North American border security perimeter seems unlikely in the current political environment. Perhaps the most prominent reason is that Canadian officials see the harmonization of visa and related immigration policies as meaning that Canada must conform to U.S. policies, and they are reluctant to do so.

If a total harmonization of security policies on a bilateral basis is neither practical nor (perhaps) desirable, what specific initiatives might be considered? This question is obviously quite open-ended, since there are a myriad of potential initiatives that might be considered ranging from the relatively mundane, e.g., increase personnel working at surface border crossings, to the futuristic, e.g., develop and deploy

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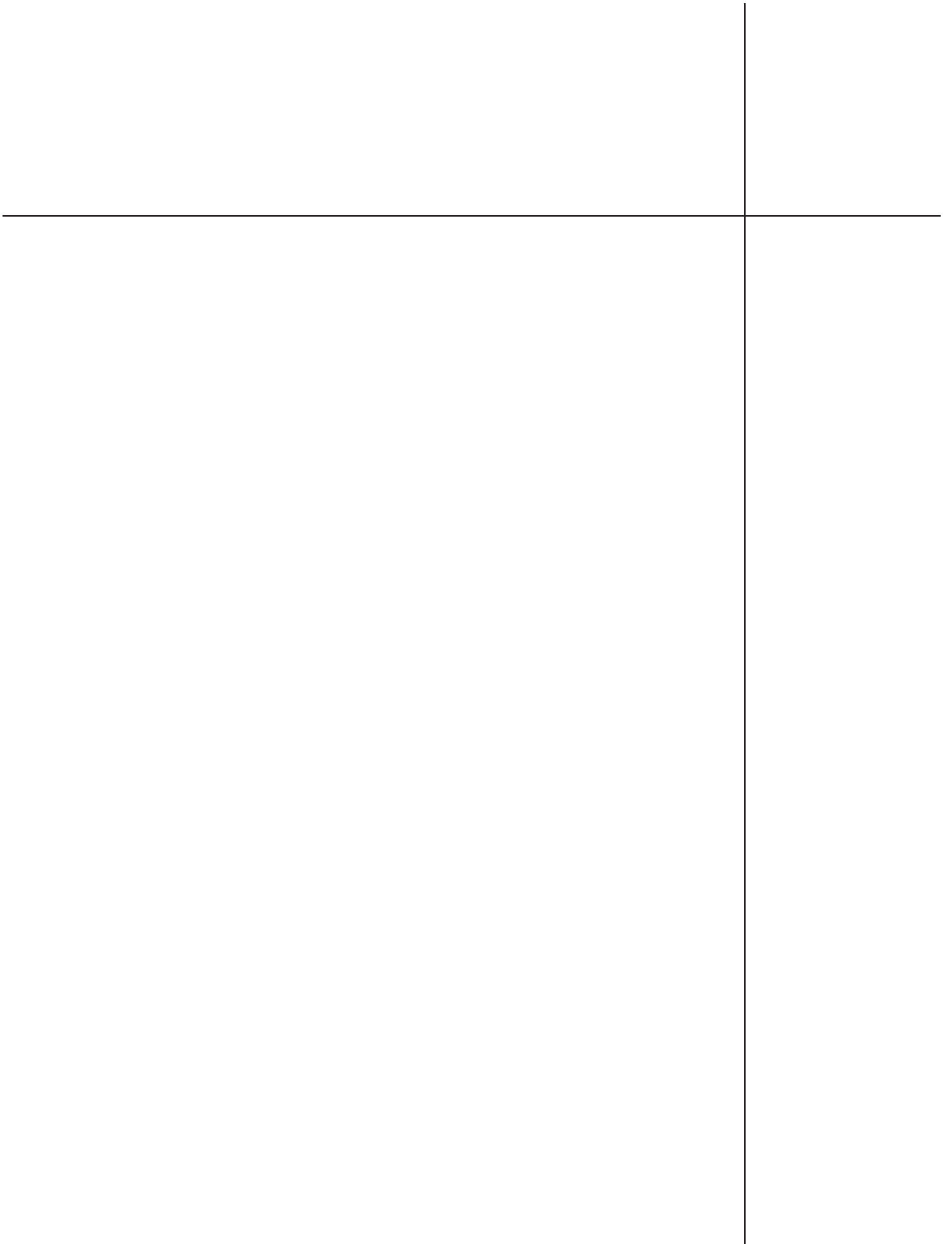
inspection technologies that can cheaply and accurately confirm the content of cargo shipments, as well as confirm the identities of drivers. It is impossible to make recommendations at detailed levels of specificity; however, several general observations can be offered.

One broad observation is that economic incentives should be implemented to encourage investments in technology to facilitate more efficient and effective security screening procedures. For example, shippers might be “risk-rated” by governments on the basis of the speed and reliability of the information that the shippers provide to government officials regarding their cargos and shippers. Risk ratings might also be based on the intrinsic terrorism hazards posed by the cargo being shipped, as well as the ports through which they are shipped. Risk ratings might, in turn, be used to assess “user fees” applied to shippers that would presumably be passed along to final consumers. The fees collected from shippers would, in turn, be used for public investments in physical infrastructure and technology deployed at the border to help provide secure and expeditious border crossings.

A second broad observation is that border security policies might acknowledge relevant differences in conditions and circumstances at individual border crossing locations. While our results identified differences in border crossing conditions across U.S. ports, it would

not be surprising if similar differences could be identified for land ports on the Canadian side. While there are clear advantages to standardizing border security procedures across all ports, there is a strong case for allowing individual ports some leeway to differentiate strategies and tactics to safeguard commercial shipments from terrorist actions while permitting those shipments to flow freely across the border.

Finally, and notwithstanding our earlier skepticism about the practicality and desirability of full integration of border security procedures on a bilateral basis, it is clear that coordination of infrastructure investments by governments on both sides of the border is imperative if infrastructure investments are to be effective. For example, capacity expansions on one side of the border may have minimal impacts on the actual speed and consistency of shipping times if bottlenecks on the other side persist. Moreover, there are likely to be significant cost savings by harmonizing the timing of infrastructure investments on each side of the border. In this regard, investments being undertaken under the auspices of the Government of Canada’s Border Infrastructure Fund seem an appropriate approach, as they involve cooperation on the part of federal, provincial and local authorities including operators of bridges and tunnels that provide rights of way to ports on either side of the border.



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