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Competitiveness and macroeconomic impacts of reduced wait times at U.S. land freight border crossings

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ABSTRACT

We analyze the macroeconomic and trade impacts of reducing wait times by adding one customs officer at each of the twelve major land freight crossings of the U.S. The change in wait time stemming from staffing changes is first estimated on the basis of primary data and then translated into changes in freight costs through a logistical model. The transportation cost changes are then fed into a multi-country computable general equilibrium model. We find that adding one customs officer at each land border crossing would, on average per crossing, generate an increase in U.S. GDP of $350 thousand and 3.58 additional jobs.

1. Introduction

The gains from free trade are well established. Most studies on interference with it focus on tariffs, quotas, or subsidies. However, various costs of regulation to support the orderly flow and safety of trade also interfere with achieving efficient outcomes. These include direct costs of administering and monitoring trade, as well as unintended spillover effects resulting from delays. Ideally, these transactions costs would be minimized.

Freight transportation coming into the U.S. is subject to inspections by officials of the U.S. Customs and Border Protection (CBP) Agency for contraband and for national security purposes. These inspections cause delays that translate into an increased cost of doing business for shippers and their customers directly and for international trade indirectly. Although the border wait times are relatively short, the sheer volume of trade translates into potentially large impacts. Inspection delays are thus an important non-tariff barrier to trade. In this paper we analyze the macroeconomic and trade impacts of adding one CBP officer at each of the twelve major land freight crossings of the U.S.

Increased staffing by CBP will reduce the cost of transporting imports from Canada and Mexico into the U.S., and benefit the export industries of these countries, with the U.S. incurring all of the cost. However, several international trade analysts have argued that it is very important to take into account the flow of both intermediate and final goods through cross-border supply chains that link the U.S. economy to those of Canada and Mexico.[1] If a large proportion of U.S. imports are intermediate goods that are incorporated into U.S. production, reducing importing cost would lower the cost of production in U.S. industries,

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[1] See Taylor et al. (2003) and Haralambides and Londono-Kent (2004) for assessments of supply chains linking Canada and Mexico to the U.S., respectively. OECD (2013) exhaustively reviews existing literature on cross-border supply chains.

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thereby making U.S. exports more attractive not just to Mexico and Canada but worldwide. Due to these subtle considerations and others associated with the process of international trade, it is possible that increasing staffing at U.S. freight crossings would be a win–win outcome for all involved. To capture these effects, it is necessary to analyze the impact of change in importing cost using a model that distinguishes between flows of intermediate and final goods and incorporates a full accounting of all inputs and not just primary factors of production. We use a computable general equilibrium (CGE) model that makes these distinctions, and our results suggest that lowering importing costs into the U.S. does in fact reduce the cost of U.S. exports and increases U.S. income and employment.

Our analysis is based on data on wait times associated with primary inspections of freight shipments collected by CBP. The change in wait time is first estimated, and then translated into changes in freight costs through a logistical model. The resulting changes in transportation costs are then fed into the Global Trade Analysis Project (GTAP) CGE multi-country model of the world economy to analyze competitiveness and macroeconomic impacts on the economies of the U.S., Canada, and Mexico. We disaggregate the inputs into GTAP for each of the twelve border crossings that we examine to further analyze the factors that most influence the outcome, including differences in wait times, effects of additional CBP staffing, effects on transportation costs, and commodity mix traversing each crossing. Fig. 1 provides a schematic description of our analysis.

We find that adding one CBP officer at each land border crossing would, on average per crossing, generate an increase in U.S. GDP of $350 thousand and 3.58 additional jobs. Both Canada and Mexico would reap net macroeconomic gains as well, with those of Canada exceeding U.S. gains. We conclude with a discussion of the policy implications of our analysis.

2. Literature review

A number of non-price factors affect the movement of goods across international borders, and some have been analyzed. Trade facilitation involves activities that improve trade capacities of various countries. Wilson et al. (2003) refer to it as the improvement of logistics at both customs offices and ports of entry (POEs), as well as the design of more efficient administration and procedures. Arvis et al. (2012) introduce the Logistics Performance Index (LPI), which considers the effect of cargo clearance effectiveness, transport and information technology infrastructure quality for logistics, ease and reasonable pricing of shipping services, timely shipping to destination, etc. We focus on how the reduction of wait times at ports of entry through reduced paperwork, increased staffing at checkpoints, and simplification of trade procedures can lower transport costs and have a significant impact on timely delivery of intermediate and final consumption goods.

Hertel et al. (2001) estimate both the short- and long-run effects of the Free Trade Agreement (FTA) between Japan and Singapore on the output, consumption, investment, exports and imports, GDP and welfare of both trading partners. The authors argue that, with the decline in global manufacturing tariffs, free trade agreements began to focus on other issues, such as regulations of e-commerce, foreign investment, and customs procedures. The authors consider potential gains from the introduction of uniform e-commerce standards in Singapore and Japan. They study the effects of automating Japanese customs procedures to make them compatible with the computer systems used by customs in Singapore, thereby allowing faster transit times and lowering administrative costs and lag times for Japan's exports and imports. Using the dynamic GTAP model, Hertel et al. (2001) find that in the short- or medium- run the trade balance in both countries declines, but it improves in the long run due to increased exports. They conclude that the increase in trade volumes between the two trading partners is mainly due to customs automation. Moreover, these trade gains in Japan and Singapore positively affect their GDP and investment.

Minor and Tsigas (2008) use a database of tariff equivalents for time in trade by product and country pairs, and a computable general equilibrium framework to simulate the reductions in trade times for four different country groups defined by level of development. They note that over the last four decades the reduction in average import taxes significantly facilitated international trade. Moreover, changes in transportation technology also contributed to the growth in trade, resulting in an average annual increase of air transport services by 10%. The authors suggest that reduced tariffs and trade times enable countries to trade a wider variety of commodities that involve low-value bulk products in contrast to advanced high value goods and food products requiring faster delivery. The study finds that "trade facilitation" is one of the important factors affecting the growth in trade across borders of developing countries. Their results also indicate that countries that reduce trade time reap significant benefits, relative to those countries that make no such improvements. This finding is consistent with the theory of supply chain management, which suggests that the benefits from the reduction in shipping times for the fastest deliverer grow with the increase of the gap between that deliverer and the next fastest deliverer. Finally, Minor and Tsigas (2008) find that in Sub-Saharan Africa the reduction in delivery times increases the export share of high value products.

Furthermore, a number of studies show a strong relationship between transport costs and the transit time required to ship goods from origin to destination (Djankov et al., 2010; OECD, 2003). The OECD (2003) study shows that indirect costs associated with delays in transit times have more significant impact on trade levels than the direct costs. Additionally, Djankov et al. (2010) find that a delay in trade by one day decreases trade levels by 1%. A study by Hummels and Schaur (2013) analyzes firms' choice between fast but expensive air transport, and slow but inexpensive maritime transport, a choice that depends on the value placed by consumers on the fast shipping and the price elasticity of demand. The authors find that the cost of an extra day of transport is 60% higher for importers of intermediate goods than for importers of final goods. Hummels and Schaur (2013) state that their results show a strong relationship between the reduction in air transport costs and fast growth in trade.