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The impact on the US economy of changes in wait times at ports of entry ☆

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ABSTRACT

Inspections of people and vehicles at US border crossings are vital to homeland security and preventing unauthorized movement of people and freight into the US interior. However, these inspections incur various costs, including imposing delays on legitimate traffic and increasing expenditures to operate the crossings. In this study, we quantify the economic impacts of delays related to movement of passenger and commercial vehicles across 17 major land border crossings and international air travelers at 4 major US airports. We estimate the value of time spent in these delays, and how this changes if one inspection officer is added to each crossing's staff. We quantify how the transportation cost for shipping goods by truck into the US changes if wait time falls, and use the GTAP CGE model to estimate the change in macroeconomic activity in the US, Canada, and Mexico caused by the decrease in transportation cost. We also determine how many new cross-border passenger-vehicle trips result from a fall in wait time, and quantify the increase in economic activity in the US and its border regions associated with these new trips. Our results indicate that changes in US Customs and Border Protection (CBP) staffing would have significantly positive impacts on US GDP, trade balances, and employment, and would also significantly reduce the opportunity cost of waiting by passengers and truck drivers. These results should prove useful to those making decisions on border inspection resources, analysts researching trade facilitation issues, and the general public and its representative organizations who incur the costs but also the benefits of inspections.
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1. Introduction

Inspections of people and vehicles at US border crossings are vital to homeland security. The benefits of these activities are the avoided consequences of movement of contraband, unauthorized border crossers, and potential terrorists into the US; at the same time, inspections incur various types of costs. The construction and operation of border crossing facilities is a significant federal expenditure. Moreover, inspections generate various spillover effects relating to the delays in the flows of passengers and cargo across US borders. On the passenger side, they decrease the amount of tourism and business travel into the country, and thus an associated loss of spending stimulus. Those people that do make the trip incur delays that cost them time. On the freight side, delays translate into increases in various explicit transportation costs, such as additional fuel, as well as implicit costs such as the value of lost time. Reducing wait times at Ports of Entry (POEs), through the addition of US Customs and Border Protection (CBP) officers, would lessen these negative spillover effects, though it will also incur additional demands on the federal budget.

This study estimates the macroeconomic impacts on the US economy of changes in primary inspection wait times at major border crossings. In addition to the changes in the direct spillover costs previously noted, it also examines various types of economic

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ripple effects of changed wait times. These include multiplier effects from tourist and business travel expenditures, as well as freight cost general equilibrium effects, which refer to complex interactions in relation to competitive changes in imports and exports of intermediate (unfinished) and final (finished) goods. We evaluate impacts on passenger and commercial vehicles but not for pedestrians crossing the US border.

The analysis is based on extensive primary data provided by CBP, federal government publications, commercial vendors, and the professional literature on the topic. At the microeconomic level the study applies economic analysis and operations research methods. At the macroeconomic level it applies computable general equilibrium analysis, where the data are extensive and the issues are complex, and the more practical tool of input–output analysis, where the subject of inquiry is less demanding. The results indicate that changes in CBP staffing would have significantly positive impacts on US GDP, trade balances, and employment. Moreover, the ensuing reductions in the opportunity cost of waiting by passengers and truck drivers are also significant. These results should prove useful to policymakers who must decide on the overall level of resources dedicated to border inspections, managers who must decide how these resources are allocated across particular inspection sites, and the general public and its representative organizations who incur the costs but also the benefits associated with inspections.

2. Methodological overview

CBP inspects vehicles, passengers, and freight shipments as they enter the US at ports of entry. If the customs officer at a primary inspection booth has concerns about a vehicle or passenger, it will be referred to secondary inspection, where a more intensive examination will be made. We evaluate only the economic impacts associated with primary inspections since secondary inspections affect a minority of traffic. Fig. 1 provides a schematic description of the three basic components of the study for which quantified estimates are made: passenger vehicle traffic at land border crossings, commercial vehicle traffic at land border crossings, and passenger flows at international airports. For each component, specific methodological approaches and assumptions were made with respect to both microeconomic and macroeconomic analysis.

2.1. Microeconomic analysis

The analysis at the level of individual POEs was carried out using CBP data and operations research and economic analysis methods. For passenger vehicle traffic at land border crossings, two key parameters are needed: how wait time changes with the number of primary inspection booths that are open, and how the number of cross-border trips changes with wait time. We quantify the response of wait time to booths opening by evaluating the results of a staffing experiment at the San Ysidro crossing in July 2012, and by developing a theoretical model of a saturated queuing system that can be applied to any crossing. The actual outcomes of the July experiment are consistent with what the model would have predicted for the experiment, thereby providing some validation. We quantify the response of cross-border trips to wait time using outcomes of the San Ysidro experiment, which yielded an elasticity value that is consistent with values of the short-run elasticity of travel volume to travel time in the literature (see Litman, 2012; Wardman, 2012).

For commercial vehicle flows at land border crossings, we adapt the theoretical model developed for passenger vehicles to quantify how wait time changes with more booths open. For passenger flows at airports, we develop a theoretical model to quantify how wait time changes with booth openings. For both of these flows, no empirical evidence is available on how wait times affect the number of trips, so we make the conservative assumption that these elasticities equal zero.

For all three flows, the changes in wait times are translated into changes in the dollar value of time spent in inspection queues. For passenger vehicle flows, the wait time changes are also converted into an estimate of the changes in passenger vehicle traffic using the elasticity of vehicle trips with respect to wait time, and then in turn into changes in tourist and business travel expenditures on the basis of average per person-visit spending by Canadian and Mexican visitors to the US. Note that we measure only the impact on the US economy, i.e., only changes in traffic by foreign visitors entering the country. However, we do take into consideration the offsetting effects of reduction in spending on the

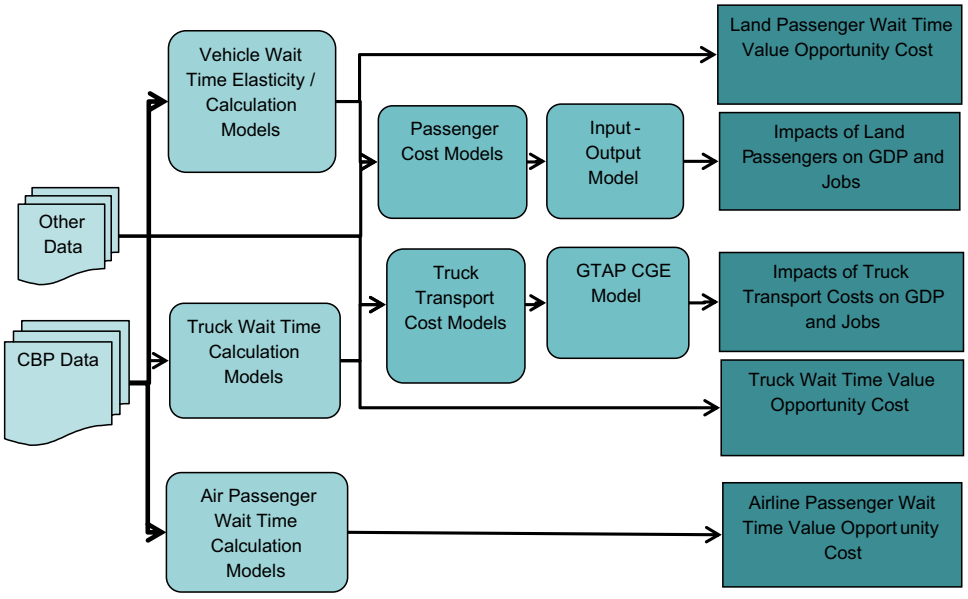

Fig. 1. Schematic of the Methodology.

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