

# **Customs as Doorkeepers What Are Their Effects on International Trade?\***

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Aid for Trade: What Have we Learnt? Which way Ahead?  
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\* The views and opinions expressed in this presentation are those of the authors and should not be attributed to the Inter-American Development Bank, its Executive Directors or its member countries.

# OUTLINE

- **Introduction**
- **Customs Processing of Exports in Uruguay**
- **Data and Descriptive Evidence**
- **Empirical Approach**
- **Main Results**
- **Conclusions**

# INTRODUCTION

## Customs as Doorkeepers

**Customs are the doorkeepers of international trade.**

All trade transactions leaving or entering countries must be processed by the respective national customs and such a processing takes time.

Last year, export processing time by the Uruguayan customs ranged between 1 day (i.e., goods were released in the same day) and 23 days.

The time it takes to complete customs procedures can thus be substantial and highly variable.

# INTRODUCTION

## Time Matters

**Time is an important trade barrier.**

Each additional day spent in transit reduces the probability that the United States sources a good from a given country by 1% and that for a manufactured good by 1.5% (Hummels, 2001).

# INTRODUCTION

## Time Matters

**Time matters for trade particularly when goods are subject to rapid depreciation.**

This loss of value may be driven by:

- spoilage (fresh produce)
- fashion cycles (shoes and garment)
- technological obsolescence (consumer electronics).

# INTRODUCTION

## Time Matters

**Time also makes a difference when demand is uncertain**, i.e., consumers prefer certain good varieties over others and their preferences change quickly (Deardorff, 2001).

If the gap between ordering and delivery is long enough, the volume and composition of shipments must be decided well before the resolution of demand uncertainty.

Forecasting errors will result in lost profitability because of inventory-holding costs or forgone business opportunities derived from over- or undersupplying the market or mismatch between varieties offered and demanded (Hummels and Schaur, 2012).

# INTRODUCTION

## Time Matters

**The costs can be transmitted throughout the value chains** and will accordingly be higher when spatial fragmentation of production prevails.

In this case, delayed delivery of critical inputs can hold up the entire production process and can generate costs that are higher than the market value of the components in question (Nordas et al., 2006).

# INTRODUCTION

## Time Matters

**Timeliness interacts with demand uncertainty and thereby affects trade, location, and modal choice** (Aizenman, 2004; Evans and Harrigan, 2005; Harrigan and Venables, 2006; Hummels and Schaur, 2010; and Harrigan, 2010).

In particular, when timely delivery is important:

- firms rely more on closer providers the higher is their products' restocking rate;
- resort more to air shipping the more volatile is the demand for their products and the lighter these products (i.e., the higher their value to weight ratios) are; and
- co-agglomerate in the presence of vertical linkages.

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

**Customs procedures may increase the transit time between origins and destinations, and can thus play a major role in facilitating or hindering exports and imports.**

A number of papers have estimated gravity models (and variants) to examine the effects of total time to trade, customs and technical control times, and time at the border on:

- aggregate bilateral trade, overall and distinguishing among time sensitive and time insensitive goods (Djankov et al., 2010; Freund and Rocha, 2011; Hornok, 2011);
- sectoral bilateral trade (Martínez-Zarzoso and Márquez-Ramos, 2008; Bourdet and Persson, 2010);
- the product and destination extensive margins (Persson, 2010; Nordas, 2006);
- the frequency and size of shipments (Hornok and Koren, 2011).

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

A few studies use firm-level data to explore the influence of time to clear customs on export statuses, export intensity, and destination diversification (Dollar et al., 2006; Yoshino, 2008; Wilson and Li, 2009a, 2009b).

All these papers generally conclude that...

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

**Delays associated with customs procedures have a significant negative impact on export outcomes, especially for time-sensitive products.**

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

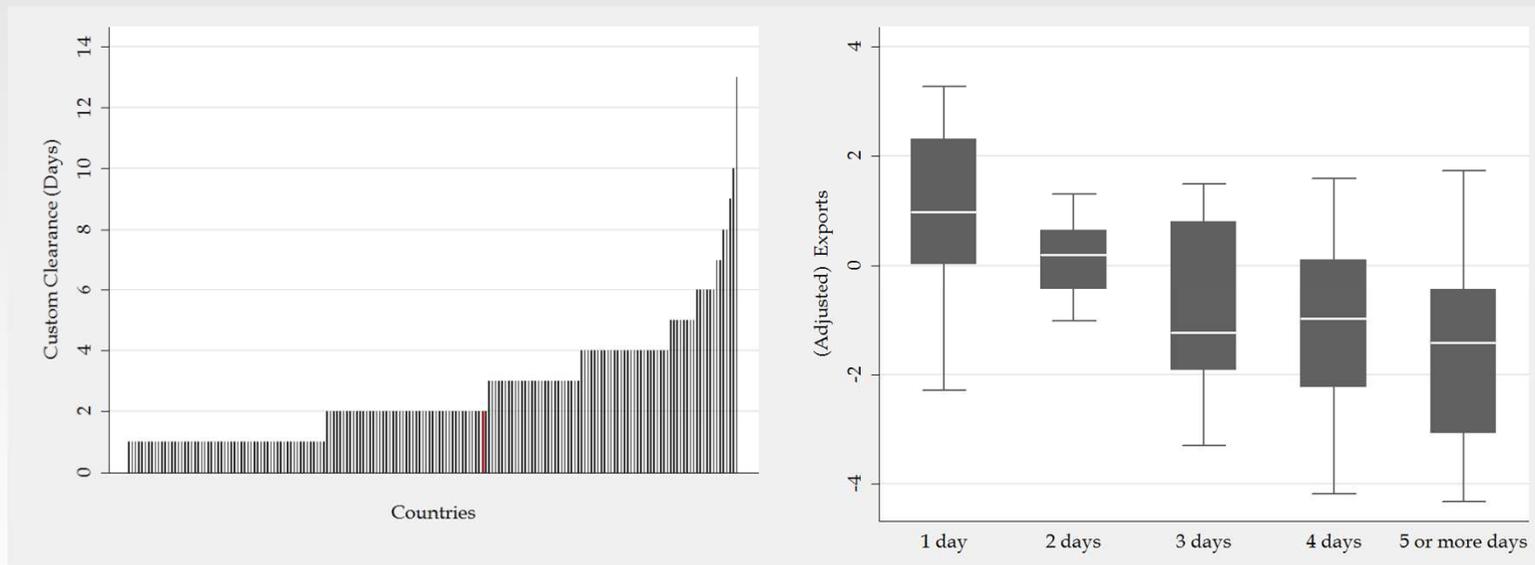
While certainly insightful, this literature has three limitations, which makes the evidence on how customs processing times affect firms' exports preliminary and incomplete.

- Most analyses are based on aggregated country-level data or relatively small samples of manufacturing firms of heterogeneous countries that are pooled together for estimation purposes.

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

- These analyses generally rely on cross-country variation in customs delays to identify the effects of interest.



This identification strategy has the drawback that country characteristics that are relevant for trade but are unobserved by the analyst and potentially correlated with administrative delays are usually not properly controlled for.

# INTRODUCTION

## The Effects of Customs Procedures: What Do We Know?

- Virtually all studies utilize the single-value, country-level measure of time to trade (or its components) from the Doing Business Indicators.

These data are without any hesitation valuable and useful as a first approximation, but they have clear limitations that are primarily related to the coverage and underlying assumptions of the survey, which in turn echoes in their precision.

These survey-based measures are not real clearance times, but personal assessments of what those times would be for a certain typical transaction primarily from trade facilitators working with freight-forwarding companies. In Uruguay only 4 firms answered the most recent questionnaire....

Overall, over our sample period, only very few firms were located in Montevideo, had more than 60 employees, and shipped goods abroad by ocean and these amounted together to small shares of the total number of exporters, which makes them hardly representative for the economy as a whole.

# INTRODUCTION

## What Do We Do?

We address three main questions:

- What are the effects of customs delays on firms' exports?
- What are the channels through which these effects arise?
- To what extent are these effects heterogeneous?

In answering these questions, we exploit a unique dataset consisting of all Uruguayan export transactions over the period 2002-2011 and recorded measures of the processing time by the national customs.

# INTRODUCTION

## Our Contributions

- We present actual measures of the exact time that takes to complete customs procedures based on official data covering the entire universe of a country's transactions over a long period of time and not from small surveys.
- We provide robust evidence on the effects of administrative delays on firm export outcomes based on data for the whole population of a country's exporting firms.

# INTRODUCTION

## Our Contributions

- By exploring the responses of the intensive and extensive margins of exports along various dimensions, we disentangle the channels through which the effects arise.
- We go beyond the average effect and uncover potential heterogeneous impacts across groups of products (i.e., specialization), destinations, and, as a novelty, on buyers.
- Our results can shed new light on the effects of trade facilitation on comparable developing countries and can feed and provide guidance for future theoretical work on the impact of time on trade.

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# CUSTOMS PROCESSING OF EXPORTS IN URUGUAY

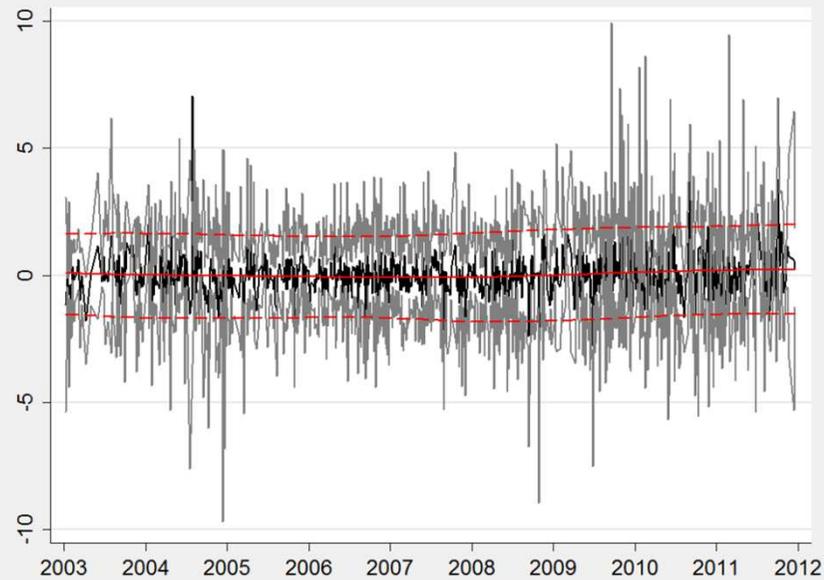
## Stylized Export Process



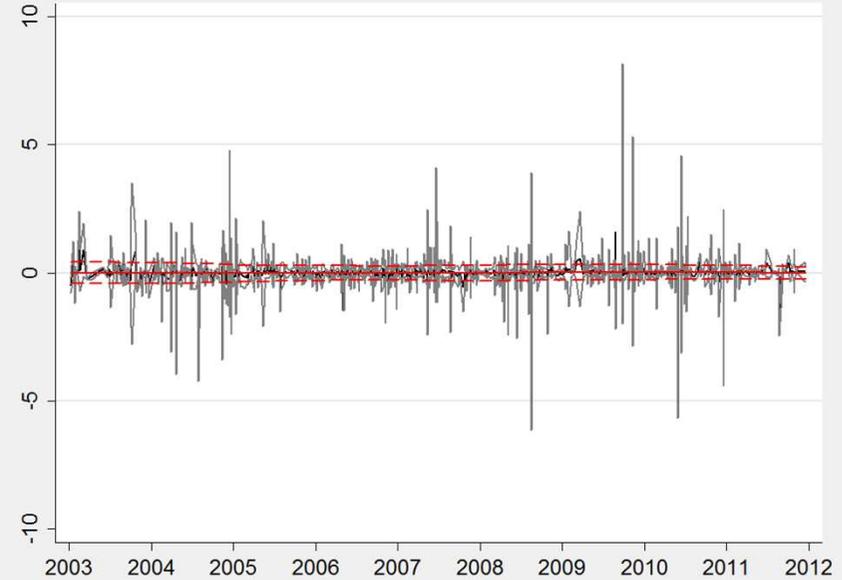
# CUSTOMS PROCESSING OF EXPORTS IN URUGUAY

## “Randomness” of Allocation to Red Channel and Delay

Allocation to Red Channel



Delay



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# DATA AND DESCRIPTIVE EVIDENCE

## Data

Our dataset consists of transaction level export data from 2002 to 2011 from the Uruguayan customs (DNA-*Dirección Nacional de Aduanas*).

Each record includes a firm's ID, the product code (10-digit HS), the customs through which the shipment exits Uruguay, the destination country, the foreign buyer (coded), the export value in US dollars, the quantity (weight) in kilograms, the channel through which the transaction was processed (either green or red), the date in which the customs-processing of the shipment was requested (channel request) and date in which the shipment left the customs (release date).

The sum of these exports virtually adds up to the total merchandise exports as reported by the Uruguayan Central Bank, with the annual difference being always less than 1.0%.

# DATA AND DESCRIPTIVE EVIDENCE

## Descriptive Evidence

<b>Aggregate Export Indicators</b>		
<b>Indicators</b>	<b>2002</b>	<b>2011</b>
Export Value	1,855.0	8,011.5
Number of Transactions	64,747	113,533
Number of Exporters	1,498	1,904
Number of Products	2,464	2,969
Number of Destinations	146	186
Number of Buyers	4,902	6,410
Number of Customs	15	16
Transactions through Red Channel	0.0	0.1
Median Delay in Red Channel	N/A	5.0

# DATA AND DESCRIPTIVE EVIDENCE

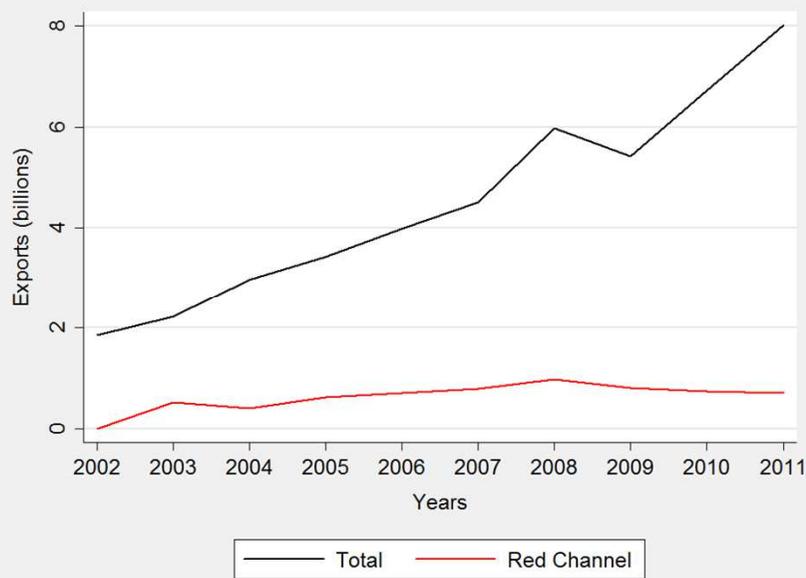
## Descriptive Evidence

Average Exporter		
Indicators	2002	2011
Export Value	1238.3	4207.7
Number of Transactions	43.2	59.6
Exports per Transaction	28.7	70.6
Number of Products	4.3	4.4
Exports per Product	238.5	981.7
Number of Destination	2.9	3.3
Exports per Destination	207.6	837.3
Number of Buyers	6.4	7.0
Exports per Buyer	234.9	781.7
Number of Customs	1.8	1.8
Exports per Customs	385.1	1398.3
Exports per Product and Destination	254.2	776.4
Number of Shipments per Product and Destination	5.7	7.1
Number of Buyers per Product and Destination	2.3	2.4
Number of Customs per Product and Destination	1.1	1.1

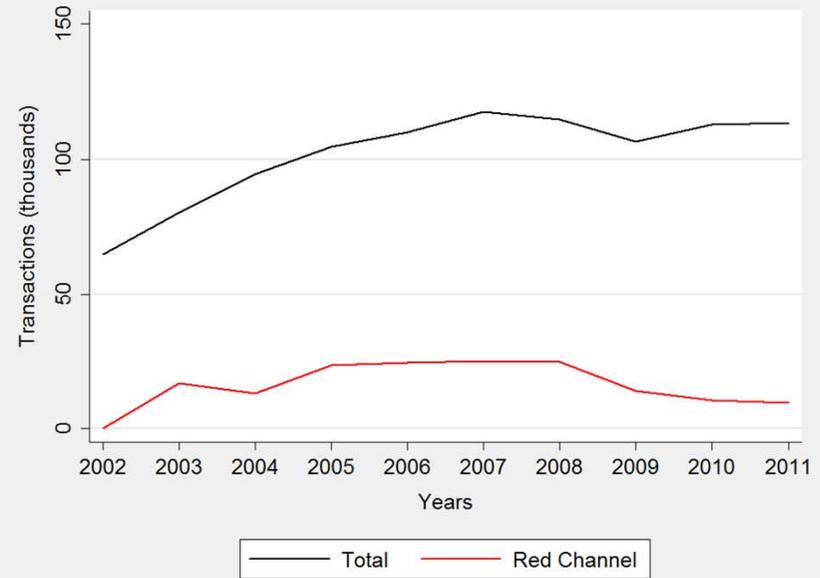
# DATA AND DESCRIPTIVE EVIDENCE

## Descriptive Evidence

### Share of Exports Under Red Channel



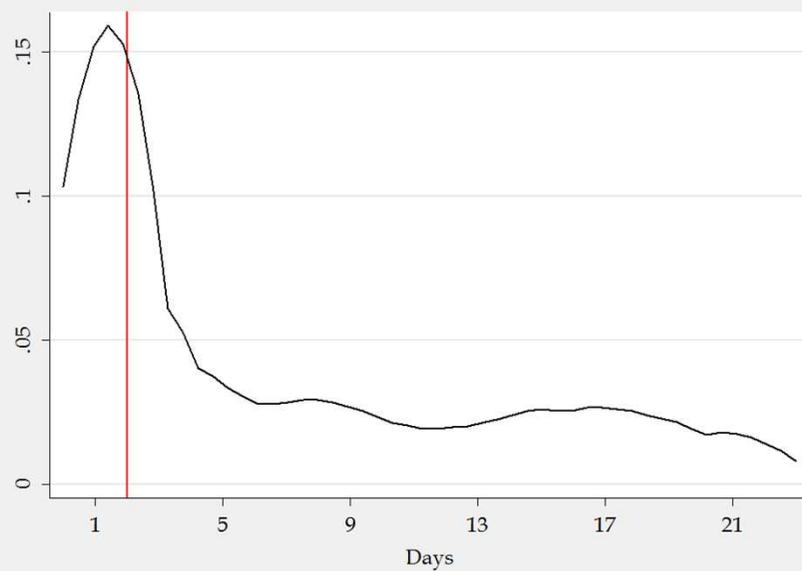
### Share of Transactions Under Red Channel



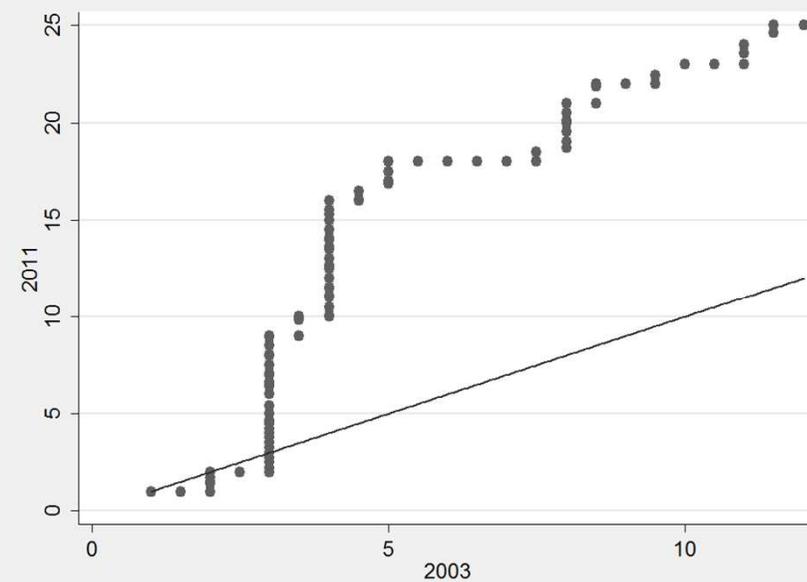
# DATA AND DESCRIPTIVE EVIDENCE

## Descriptive Evidence

Distribution of Delays (RC, 2011)

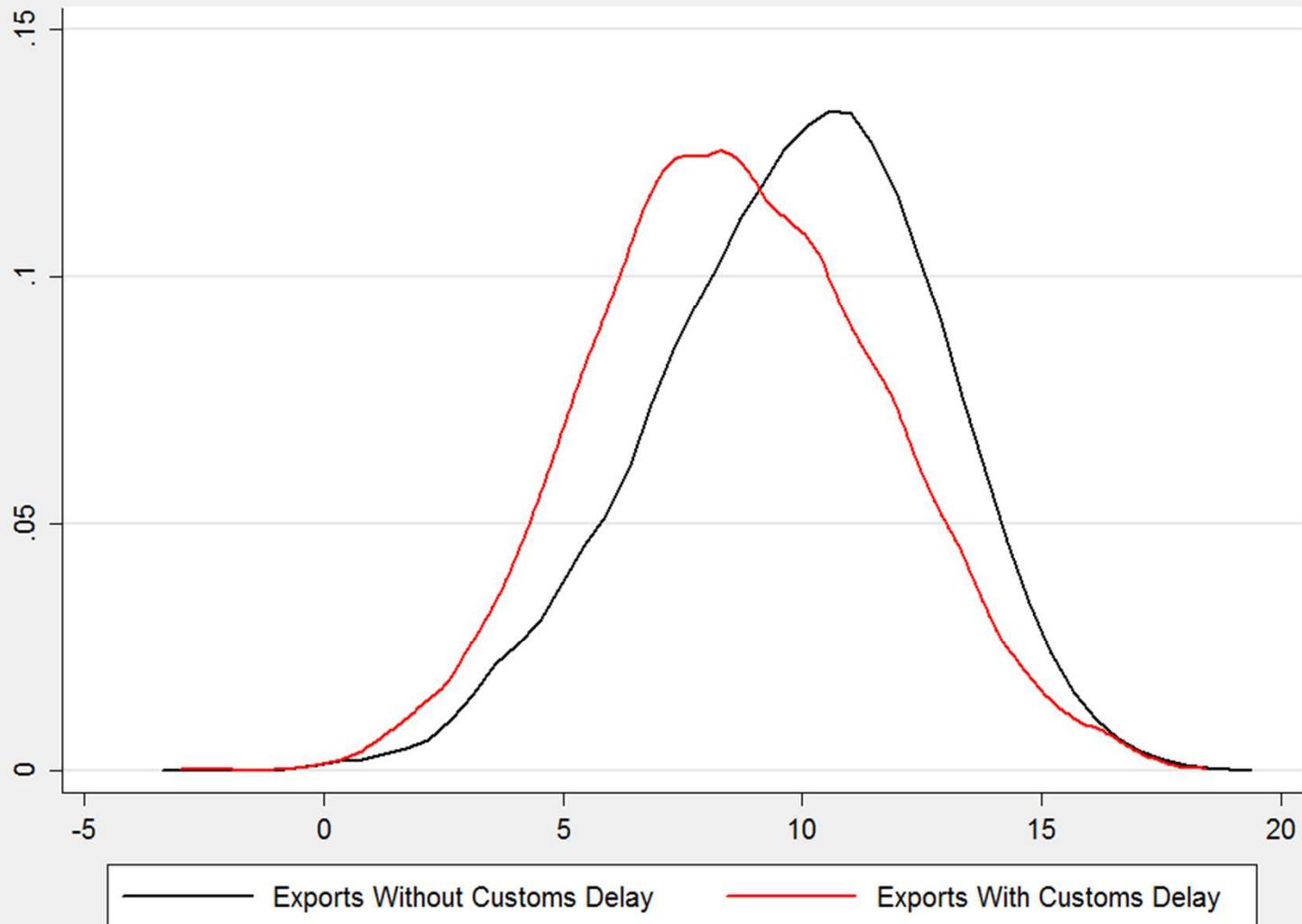


Change in Distribution of Delays (RC, 2003-2011)



# DATA AND DESCRIPTIVE EVIDENCE

## Descriptive Evidence



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# EMPIRICAL APPROACH

## Estimating Equation

### Main Equation

Change in firm exports of a given product to a given destination between two consecutive years = Change in the median delay faced by the firm in exporting the product to the destination in question between the same consecutive years + Time-varying firm specific factors + Time-varying product-destination factors.

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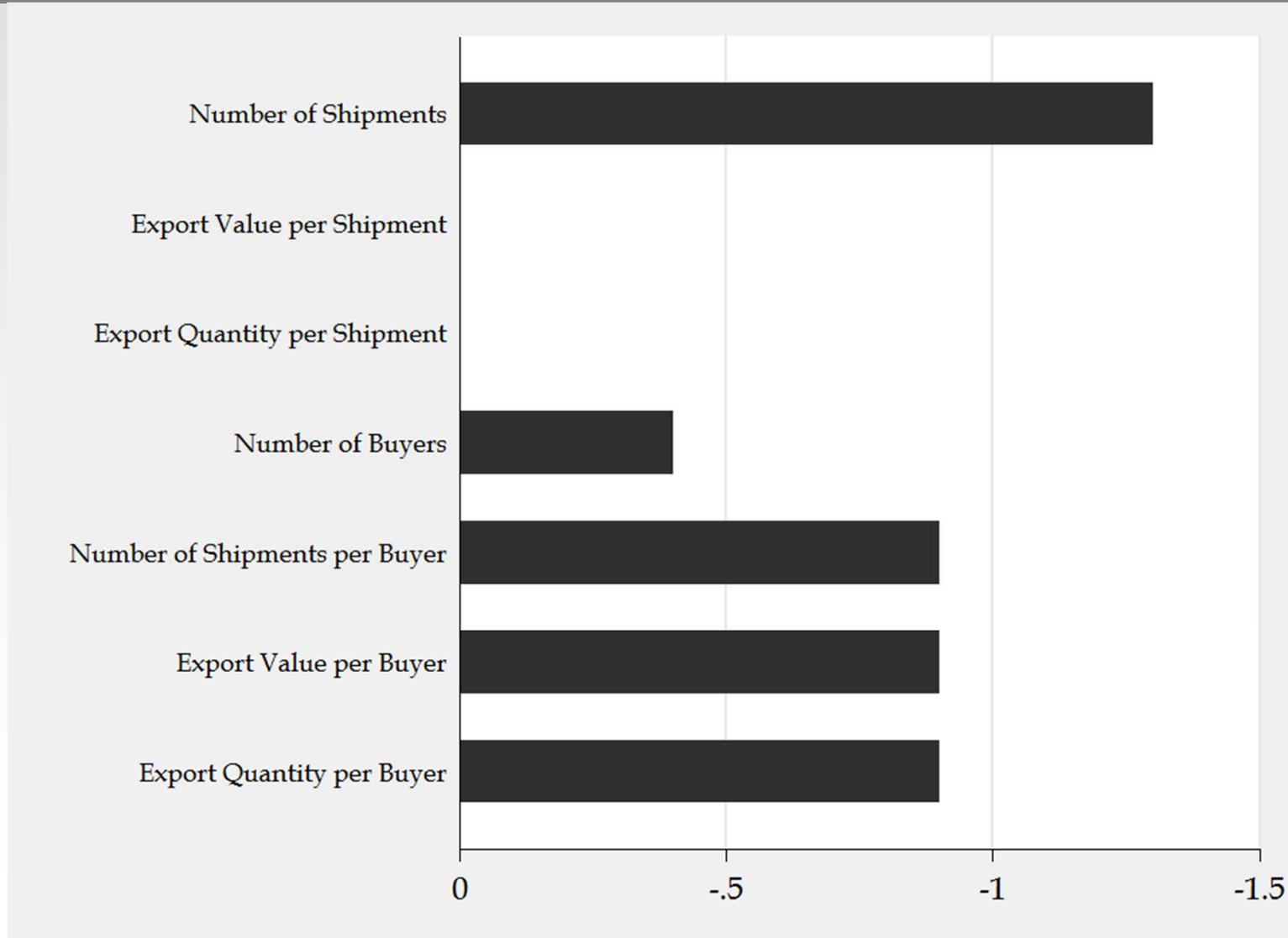
# MAIN RESULTS

## Baseline Results



# MAIN RESULTS

## Channels



# MAIN RESULTS

## Robustness

**Not convinced?...**

We also control for time-varying firm-destination specific factors, time-varying firm-product-factors, customs branches, and even time-varying firm-product-destination-factors when using higher frequency data...

And carry out several placebo exercises...

**The results remain the same.**

# EMPIRICAL APPROACH

## Heterogeneous Effects

**Does time matter the same across the product and destination space?**

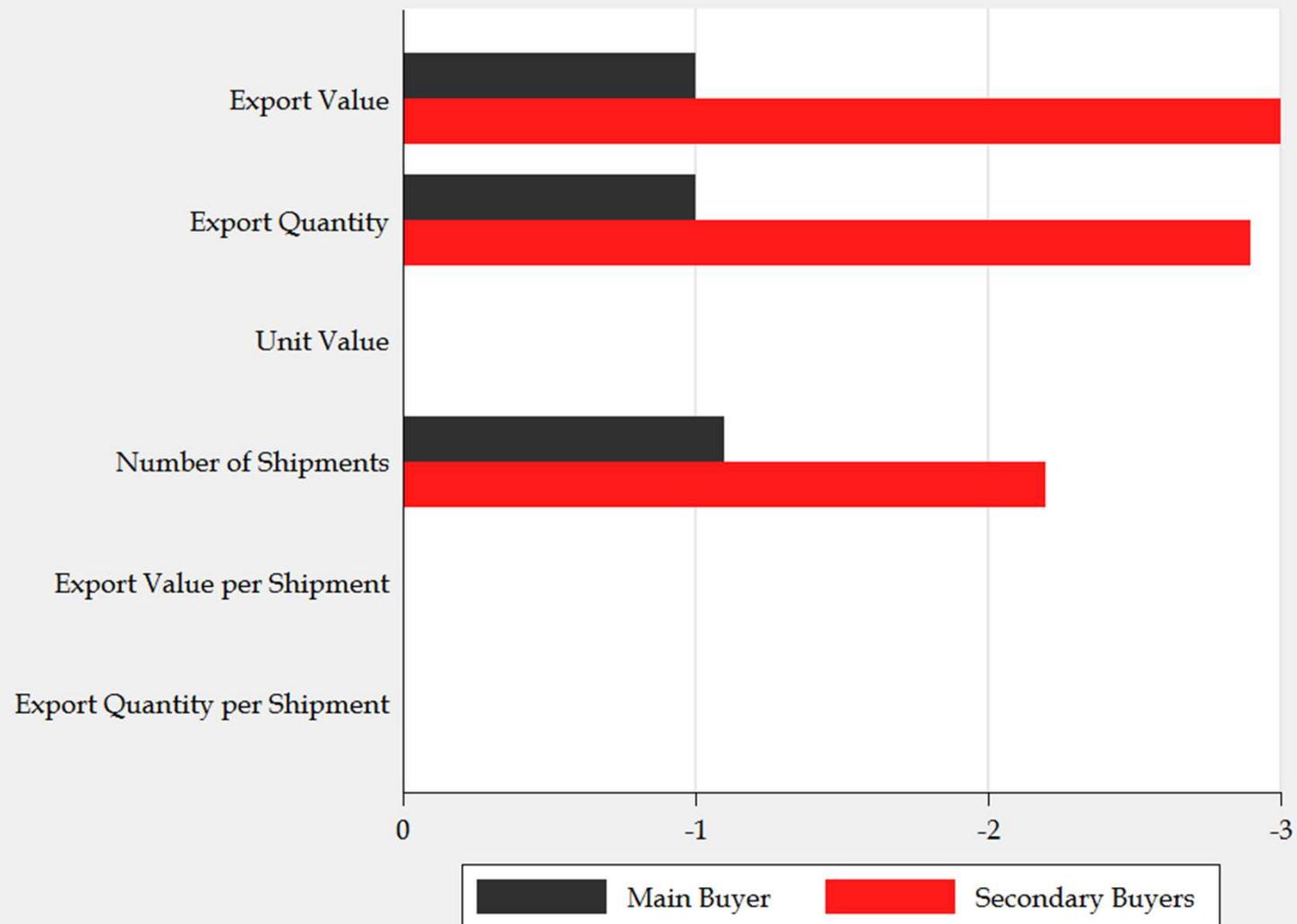
Effects may differ across products and destinations, and *buyers*...

For instance, impacts can be larger for time-sensitive products or in destinations with tougher competition.

Hence, the estimation equation is also generalized to explore the existence of heterogeneous effects across those groups.

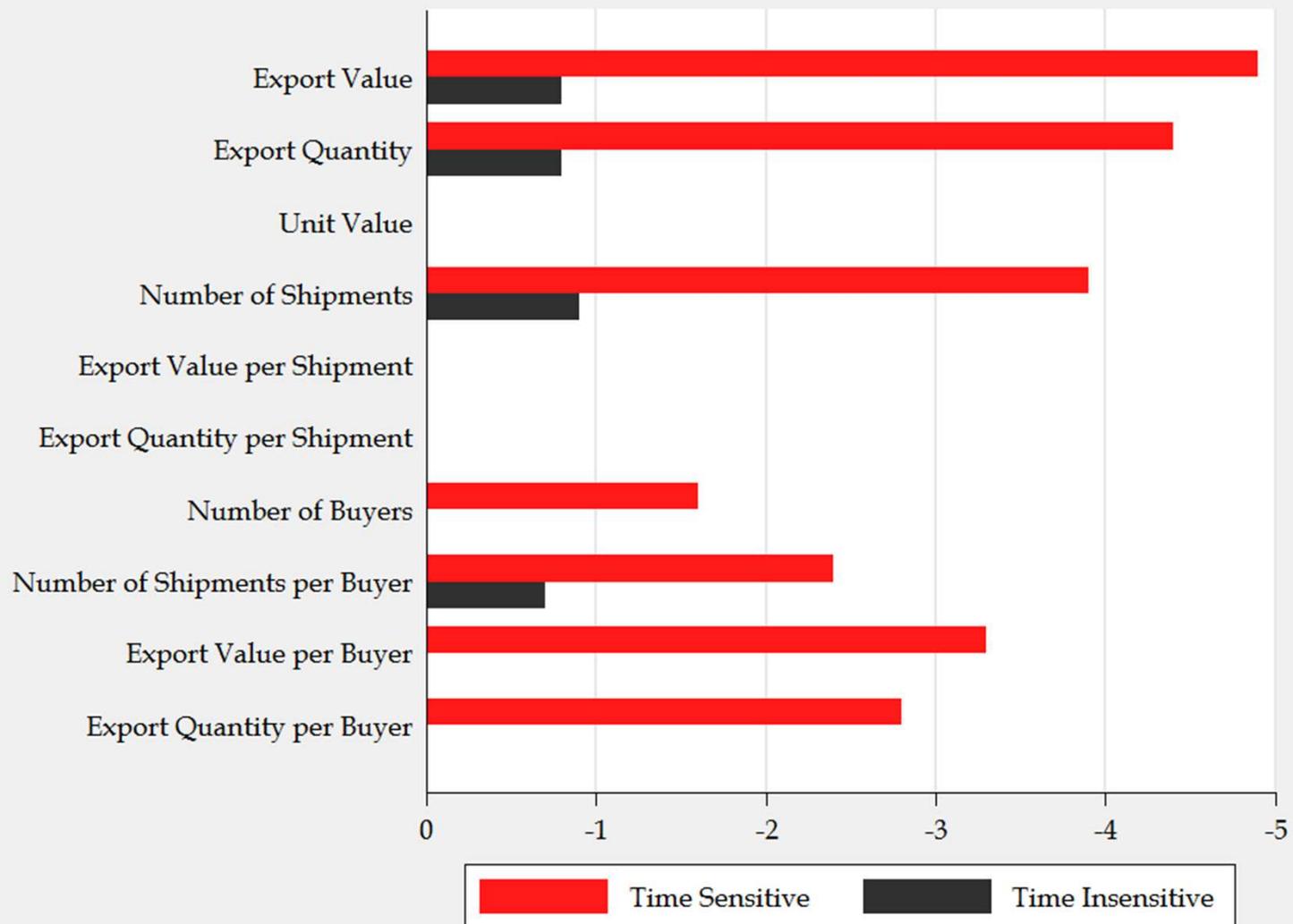
# MAIN RESULTS

## Heterogeneous Effects by Buyers



# MAIN RESULTS

## Heterogeneous Effects by Products



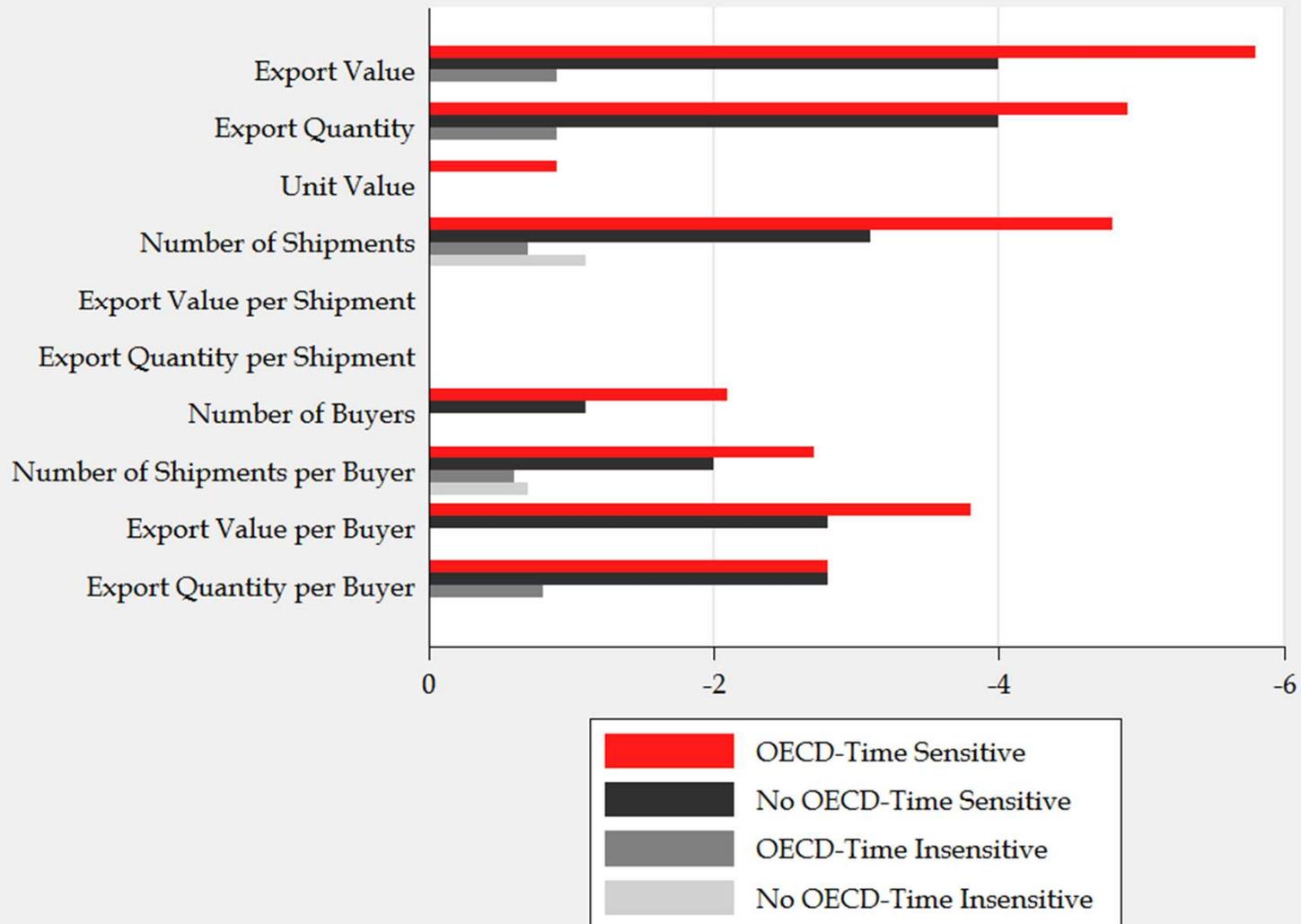
# MAIN RESULTS

## Heterogeneous Effects by Destinations



# MAIN RESULTS

## Heterogeneous Effects by Products and Destinations



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# CONCLUSIONS

## What Did We Learn?

Time matters for trade, probably more now than ever, and its importance is likely to continue to grow because of increasingly segmented production chains and rising lean retailing, among other reasons.

In this context, which is also characterized by relatively low traditional trade barriers such as tariffs, the effectiveness of public entities affecting the transit time between origin and destination becomes critical.

This is particularly the case with the customs, which process all trade flow entering and leaving the countries.

Our understanding of the effects of delays associated with customs procedures has been so far limited because of the absence of precise measures of these delays and the virtual lack of evidence on firm-level responses based on comprehensive samples.

# CONCLUSIONS

## What Did We Learn?

**We investigate how increased transit times caused by customs processing of shipments affect firms' exports outcomes** by exploiting a unique database that contains export transaction and actual customs clearance time data and covers the entire universe of export transactions in Uruguay over the period 2002-2011.

**We find that customs-driven delays have a significant negative effect on firms' foreign sales.** In particular, each additional day spent in customs is associated with an average reduction of 1.4% in the export growth rate.

**This impact is even more pronounced on sales to non-core buyers and of time-sensitive goods to OECD countries.** In this latter case, export growth is 5.8% lower for each day elapsed under customs oversight.

These effects can be traced back to reduced growth of the number of transactions, the number of buyers, and exports per buyer, in terms of value and quantity. Estimates also suggest that some firms may have been forced to cease to exports to certain markets.

# CONCLUSIONS

## What Did We Learn?

**Importantly, the frequency of material verification does not seem to influence exports.**

These results convey a clear message to customs of developing countries.

**Monitoring can and should be done as it does not hurt trade, as long as it is carried out in an expedite manner, so that no substantial increase in transit time occurs relative to those shipments exempted from physical control.**

Caution, however, is required in moving in this direction.

Expediting should by no means come at the expense of the quality of the verifications. The time that controls take should be minimized whenever possible, but always subject to the condition that their goals are actually achieved.

Our findings can serve as a basis for further theoretical developments on time as a trade barrier, which will be the subject of future research.