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What does "Doing Business" Really Measure? Evidence from Trade Times

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Abstract: The World Bank's Doing Business project claims to provide "objective measures of business regulations in 190 economies". In the trade literature, a key use of these data has been to show the impact of border delays on trade performance. We revisit previous results using a structural gravity model and panel data for 2005-2015. Although we confirm the original finding, we also show that trade times have a negative and statistically significant impact on services trade—even though services do not cross borders in any physical sense. The effect disappears when we use the OECD Trade Facilitation Indicators as our explanatory variable. Although the trade time data undoubtedly capture important aspects of the business climate, our results cast doubt on the extent to which they actually measure delays due to border formalities.

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HIGHLIGHTS

A structural gravity model confirms previous findings on the impact of time on goods trade flows

However, Doing Business's "Trading Across Borders" data also have a strong and negative relationship with services exports that do not physically move or cross borders

The indicator therefore likely captures a more general picture of the business climate, rather than the actual costs and time associated with border procedures

1 INTRODUCTION

The World Bank's Doing Business project has revolutionized the study of comparative economics. Starting with the regulation of market entry (Djankov et al., 2002), the project has expanded to cover a wide range of policy areas. The basic methodology is the same: surveys of knowledgeable parties, typically law firms or other professionals involved in the specific areas under consideration, asking about the time and cost involved in completing a defined series of steps for a hypothetical transaction.

Doing Business's "Trading Across Borders" (TAB) component has assumed particular prominence in the international trade literature following the seminal contribution of Djankov et al. (2010). This dataset claims to describe the time and cost taken to complete trade-related formalities in relation to a hypothetical goods trade transaction, including inland transit, documentation preparation, and border delays. The data come from law firms and freight forwarders, but in some cases there were no recorded contributors to TAB who potentially could be directly involved in trade and logistics (Sharafeyeva, 2019). Another concern is that in many cases, reported data refer only to businesses in the economy's largest city and rely on consultancy firms in the capital rather than traders' actual experience in crossing borders. Despite that, the TAB datasets are appreciated by researchers as they have wide coverage and highlight important policy issues. More than 50% of recent studies estimating the impact of cross-border costs on trade flows used TAB for their analysis (Sharafeyeva, Forthcoming).

Djankov et al. (2010) use 2005 data to show that the time taken to export goods has strong explanatory power for bilateral trade flows. Based on a gravity model, they conclude that an extra day's delay reduces exports by about 1%. Freund and Rocha (2011) use the same data to show that when comparing the effects of transit, documentation, and port and customs delays on trade, the most significant effect comes from inland transit. More recently, Li (2019) has used the data to show that a 10% reduction in export delays could increase sectoral exports by 2.3%-6.2% in OECD countries. Results like these have been influential in policy circles, and helped build the case for the WTO Trade Facilitation Agreement (TFA), which explicitly aims to support more rapid border crossings by simplifying formalities.

This paper revisits the Djankov et al. (2010) result. Our value added is in showing an unexpected result: the TAB time data have strong explanatory power for services trade as well as for goods, even though services do not see any internal transit, border delays, or even preparation of customs documentation. The effect persists even when we limit consideration to border delays as per the new TAB methodology. The survey data are likely capturing a more general feature of the business environment than just trade times affecting international movements of goods, as evidenced by the fact that more precise data measuring policy inputs into border delays do not show any association with services trade. We therefore conclude that it is important for applied policy researchers to focus on obtaining and using appropriate "input" policy data, rather than focusing on "outcome" measures that may be broader measures than their names or definitions suggest.

Against this background, the paper proceeds as follows. Section 2 introduces our structural gravity model and relates it to the literature. Section 3 presents and discusses estimation results, while Section 4 concludes.

2 STRUCTURAL GRAVITY MODEL

In the current international trade literature, the standard gravity model takes the following form:

$$(1)\ X_{ijt} = F_{it}F_{jt}t_{ijt}^{-\theta}e_{ijt}$$

Where: Xijt is exports from country i to country j in year t; the F terms are exporter-year and importer-year fixed effects; t is bilateral trade costs; θ is a parameter capturing the sensitivity of demand to cost; and e is an error term satisfying standard assumptions. Arkolakis et al. (2012) show that a wide class of trade models have the same macro-level implications for the relationship between trade flows and trade costs, even though their micro-level predictions are quite different.

To complete the gravity model, we specify a trade costs function:

$$(2)\ t_{ijt} = b_1 time_{ijt} * intl_{ij} + b_2 RTA_{ijt} + D_{ij} * t$$

Where: Time is the variable of interest, namely border crossing times, interacted with a dummy identifying international trade observations; RTA is a dummy for membership of a preferential trade agreement; and the D terms are country pair fixed effects interacted with a time trend. Together (1) and (2) are consistent with recent gravity papers like Baier et al. (2019). By using this kind of model, we are identifying the effect of time on trade based on differences within country pairs over time, as well as between internal and external trade for each country pair. The fixed effects formulation is extremely rigorous, and limits simultaneity concerns.

To estimate the model defined by (1) and (2), we use Poisson Pseudo Maximum Likelihood (PPML), for the range of reasons set out by Piermartini and Yotov (2016). Bilateral trade data for 2005-2015 are sourced from the Eora multi-region input output table. The reason for preferring this source to UN Comtrade is that it contains data on intra-national trade, which is required for the structural gravity model to provide consistent and unbiased estimates. Data on export and import times come from the TAB component of Doing Business. Historical and geographical controls come from CEPII, while data on trade agreements comes from Mario Larch's RTA database (Egger and Larch, 2008; updated annually). For additional tests we use the OECD Trade Facilitation Indicators.

We rearrange the trade time data relative to the original formulation in Djankov et al. (2010). Those authors use export time only, with import time absorbed by importer fixed effects. Since trade times only affect international, not intra-national, trade observations, we can achieve identification of time variables on both the exporter and importer sides while including fixed effects in both dimensions. However, preliminary analysis shows that export time in the exporting country and import time in the importing country are strongly correlated in the context of a panel data model with exporter-time and importer-time fixed effects, and country pair time trends. The within-R2 of a regression of export time in the exporter on import time in the importer is 0.80. As a result, it is very difficult to obtain independent estimates of the two effects. We therefore assume that the elasticity of trade with respect to time is independent of where the delay occurs, and construct our time variable as the sum of export time in the exporting country and import time in the importing country.

Table 1 presents estimation results. R2s are very high because of the large numbers of fixed effects. Columns 1 and 2 use data for 2005, 2008, 2011, and 2014. The reason for not estimating data using all years is that trade typically takes time to adjust to policy changes, and including all years can magnify problems due to correlation in the error term over time (Yotov and Piermartini, 2016). Column 1 shows that trade time has a negative and 1% statistically significant impact on trade times in goods, with the coefficient close to some of the estimates in Djankov et al. (2010). However, column 2 runs the same model for services, and finds the same result: trade times seem to have a negative and statistically significant impact on services trade as well. A possible explanation is that the pre-2015 TAB data capture a range of factors in addition to border crossing delays, in particular document preparation, which may reflect broader issues of administrative burden and government efficiency that are also relevant to services trade. Columns 3 and 4 therefore re-estimate the model using data for

2015 only, where the time variable is now limited to border crossing time. Surprisingly, the result persists: Doing Business trade times do not only appear to negatively affect goods trade, as would be expected, but also services trade, even though no border formalities are involved in that case.

To show that the observed association between trade times and services trade is an artifact of the TAB data, we rerun the structural gravity model with OECD TFI data. This indicator captures policy inputs into the trading process, not outcomes that may depend on other factors. Columns 5 and 6 (using 2011 and 2014 only due to limited availability of the TFI data), which mimic Kumar and Shepherd (2019), show that TFI implementation has the expected positive and statistically significant impact on goods trade, but not on services trade.

Table 1: Gravity model estimation results.

	(1) Goods	(2) Services	(3) Goods	(4) Services	(5) Goods	(6) Services
Log(Time)*Intl	-0.297 ***	-0.415 ***	-0.332 ***	-0.296 ***		
	(0.023)	(0.037)	(0.038)	(0.028)		
Log(TFI)*Intl					0.057 ***	-0.020
					(0.013)	(0.020)
RTA	-0.031 **	0.043 ***	0.332 ***	0.404 ***	0.011 ***	-0.009 **
	(0.014)	(0.011)	(0.096)	(0.091)	(0.003)	(0.004)
Constant	20.322 ***	21.510 ***	24.683 ***	24.619 ***	20.385 ***	21.625 ***
	(0.020)	(0.007)	(0.424)	(0.333)	(0.001)	(0.000)
Observations	97344	97344	26254	26254	47580	47580
R2	1.000	1.000	0.980	0.995	1.000	1.000
Gravity Controls	No	No	Yes	Yes	No	No
Fixed Effects	Exporter-Year Importer-Year Pair*Time	Exporter-Year Importer-Year Pair*Time	Exporter Importer	Exporter Importer	Exporter-Year Importer-Year Pair*Time	Exporter-Year Importer-Year Pair*Time

Note: Estimation is by PPML. Robust standard errors adjusted for clustering by country pair are beneath the parameter estimates. Statistical significance is indicated by: * (10%), ** (5%), and *** (1%). Gravity controls are: log(distance), and dummies for a colonial link, common colonizer, common language, common border, and international observations.

3 CONCLUSION

The policy argument for improving trade facilitation has largely been made using outcome data based on surveys, as in Djankov et al. (2010). We have shown that such measures are highly problematic in applied research: TAB trade times appear to affect services trade in much the same way as goods trade, which is not plausible.[3] The finding persists even when newer, more narrowly defined, data are used. It only disappears when completely different data are used to measure performance based on policy inputs, rather than observed outcomes. This finding has implications for applied research on the links between time and trade performance, but also potentially for econometric analysis using other Doing Business indicators. The data may measure useful dimensions of the business climate, but it is doubtful that they are sufficiently narrowly defined to inform policy. More specific time data, as in Hummels and Schaur (2013) or customs treatment at a micro-level (Volpe Martincus et al., 2015) appear more reliable.

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[3] In additional results, available on request, we show that the same problem is evident with the trade times in the World Bank's Logistics Performance Index survey.

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